SENIOR SCHOOL

CURRICULUM

2016-17

VOLUME-IV
(PART-I)

Finance, Business and
Management Based Courses

CENTRAL BOARD OF SECONDARY EDUCATION
"SHIKSHA KENDRA", 2, COMMUNITY CENTRE, PREET VIHAR, DELHI – 110 301"

FINANCE, BUSINESS AND MANAGEMENT BASED COURSES

1. Office Secretaryship
2. Stenography and Computer Application
3. Accountancy and Taxation
4. Marketing and Salesmanship
5. Banking and Insurance
6. Retail
7. Financial Market Management
8. Library and Information Sciences
9. Business Administration

OFFICE SECRETARYSHIP

Objective

This course is intended to make students proficient in the skill of office secretaryship. The office secretary's work includes supporting management, including executives, using a variety of project management, communication & organizational skills. They are responsible for most front-office procedures, such as photocopying, faxing, scheduling, word processing, filing, greeting clients, mail sorting and phone call routing. Most employers prefer secretarial experience to education, and do not usually require applicants to have more than a high school education. Good communication and interpersonal skills are essential. The students will be able to learn about office procedures, names of accounts and vendors, accounts receivable, accounts payable and so forth.

CLASS–XI
ELECTIVE
OFFICE PROCEDURES & PRACTICES (604)
(Common for Office Secretaryship and Stenography & Computer Application)

THEORY

Time: 3 Hours ***Marks: 60***

Unit-1: Introduction of Office, Lay-Out and Environment **10**

- Meaning, functions, importance.
- Centralization & decentralization of office services.
- Office layout – types, open and private office.
- Office environment – meaning and elements (lighting, noise, interior decoration, cleanliness and security).

Unit-2: Office Stationery – Inventory Control **10**

- Types of stationery used in office.
- Procedure of purchasing, inspection, storing and issuing of stationery.
- Control on consumption of stationery.
- Keeping record of stationery.
- Maintenance of stock registers.
- Office forms, manuals – meaning and importance.

Unit-3: Secretarial Functions **10**

- Meaning of Office Secretary (personal/private secretary).
- Qualities of a secretary – personal & professional qualities.
- Duties of a secretary.

Unit-4: Making Travel Arrangements **10**

- Use of air, rail, road time table and fare calculation.
- Making tour programme of an executive.
- Making reservations – through travel agents, direct purchase, e-ticketing.
- Submission and preparation of TA Bills.

Unit-5: Banking Services 10

- Opening of Bank a/c: Saving, Current, Recurring deposit and fixed deposit.
- Knowledge about different forms used in the bank: Deposit, withdrawal, demand draft.
- Banking services – ATM, lockers, E-payment, credit/debit/smart card, ECS Electronic clearing services,
  E-banking.

Unit-6: Office Correspondence 10

- Meaning, essentials of a good letter.
- Types of official correspondence – circular letters, Memorandum, DO letter, UO note, Office order, Notification.
- Application for a job/personal letter.

PRACTICAL

Time: 2 Hours ***Marks: 40***

Note: The practical work should be as near as the actual work performed in an office.

Job-1: Working in the Office 5

- Maintenance of Registers for stationery, making entries in the stock Registers.
- Making entries in Bin Cards, stationery requisition slip and issue of stationery.

Job-2: Practice of Secretarial Duties 5

- Doing receptionist work, attending visitors/callers, incoming telephone calls etc.

Job-3: Making Travel Arrangements 5

- Preparation of tour programme.
- Railway / Air reservation.
- Booking Hotel accommodation.
- Filling forms for tour advance.
- Preparation and submission of TA bills.

Job-4: Banking Services 5

- Filling up of forms – opening of saving Bank account, withdrawal slip, demand draft and cheque writing.

Job-5: Office Correspondence 5

- Drafting a Memo letter.
- Drafting a DO letter.
- Application for job.

Job-6: Viva & File Work 15

CLASS–XI
ELECTIVE
TYPOGRAPHY & COMPUTER APPLICATION (ENGLISH) (607)
(Common for Office Secretaryship and Stenography & Computer Application)

THEORY

Time: 2 Hours ***Marks: 30***

Part-I: Typography

Unit-1: Introduction to Typography 5

- Origin and development of typewriting.
- Importance and Utility of typewriting.
- Types of Machines – manual, portable, noiseless (Braille), Electronic.
- Computers and laptops.

Unit-2: Key-Board Operations 5

- Sitting posture.
- Touch and sight methods.
- Learning home row, upper row, bottom row.
- Learning number row, special signs and symbols & Roman numbers.

Unit-3: Display Techniques 5

- Margin setting and line spacing, alignments, centering of heading.
- Use of punctuation marks.
- Paragraphing.
- Syllabification and calculation of speed.
- Typing of tabular statement.

Part-II: Computer Applications

Unit-4: Computer Hardware 4

Personal Computers: Identification / demonstration of different storage devices like floppy disk & floppy disk drive, Pen Drive, CD & DC-drive, DVD Drive, Hard Disk – HDD, Storing & retrieving data from various Storage Devices, Identification of various input & output devices, different types of printer – Dot Matrix, Inkjet / DeskJet / Bubble jet, Laser printer.

Introduction to troubleshooting of Personal Computers with reference to Connectivity (USB, PS2, Keyboard Port, Monitor Socket, Speaker / Microphone Socket) for connecting devices such as Keyboard, Mouse, Monitor, Scanner, Printer, Speaker, Microphone, Pen Drive and Web Cam, Setting of basic properties of Monitor and Printer.

Unit-5: Windows Operating System 2

Introduction to Windows: Logging on, switching between accounts, Accounts aren't just for networks, Assigning and changing account passwords, shutting down minimizing windows, enlarging windows manually changing window sizes, moving windows, closing a window, a window's menu, a window's toolbar, taskbar & Start button functions and review.

Working with Windows: Looking at my Computer window, working in the my Computer window, other start menu window, navigating and using Windows Explorer and Control Panel.

Unit-6: Office 4

Introduction to Office: Introducing Word, Excel, PowerPoint, Outlook, Optimizing office shortcut bar, the office assistant, sharing information, the web toolbar.

Unit-7: Ms Word 5

Processing with Word: Beginning with Word, Entering text, selecting text deleting text, copying cutting and pasting text, finding and replacing text with basic and advanced options, auto correcting and auto formatting, correcting mistakes, spelling and grammar corrections.

Formatting with Word: Simple character formatting – changing fonts and colors of text. Inserting numbers and bullets, paragraph formatting – center align, left align, right align and justify text tab setting, setting indentation and spacing, the ruler, setting page margins, Inserting line and page breaks, Formatting with styles, using format painter, previewing document before print.

Managing Documents and Customizing Word: Document properties, using word's advanced proofreaders – using the spell checker, using automatic hyphenation, using the thesaurus, Simple transaction, customize features and options settings.

Advanced Word Features: Inserting special characters, inserting dates and page numbers, inserting pictures, inserting scanned and digital camera images, creating and using auto text entries, adding tables to documents – creating new table, traversing the table, Inserting new columns and rows, drawing tables freehand, Using header and footer options, adding footnotes and endnotes.

PRACTICAL

Time: 3 Hours ***Marks: 70***

1. Key Board Operations 30

Accuracy key boarding skills for typing a paragraph using typing tutor software minimum benchmark accurate typing speed of 20 words per minute.

2. MS Word 25

Creating, formatting and page setting a document keeping the following areas in mind.

- Folder Creation.
- Font – size, type, style.
- Alignment – left, right, center, justify.
- Page setting – Left Margin, Right Margin, Top Margin, Bottom Margin.
- Spell check & corrections.
- Saving in the newly created folder.
- Printing the document.
- Finding and replacing words.
- Saving the changed/modified document in the folder.
- Reprinting the changed document.

3. Practical File 10

Should contain at least 20 printouts of documents typed over the year verified by the Teacher/ instructor concerned to be shown at the time of final practical examination.

4. Viva 5

CLASS–XI
ELECTIVE
TYPOGRAPHY & COMPUTER APPLICATION (HINDI) (609)
(Common for Office Secretaryship and Stenography & Computer Application)

THEORY

Time: 2 Hours ***Marks: 30***

PART–I – Vad.k foKku & F;ksjh (lS¼kfUrd)

û- Vad.k foKku dk ifjp;kadu **5**

VkbijkbVj dh mi;ksfxrk] egRo vkSj fodkIA

fofHkUu izdkj dh e'khusa & gLrpkfyr ekud ;a=k] oguh;] /ouh&jfgr] czsy&jkbVj] bysDVkWfud ;a=k] daI;wVj ,ao ySi&VkWi dk fodkIA

dqathiVy lapkyd **5**

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Vad.k fof/;ka& n`'; ,oa Li'kZ fof/A

vk/kj iafDr ;k nwljh iafDr dk vH;kl]

rhljh ;k ijh iafDr dk vH;kl]

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fo'ks"k fpg~uksa dk iz;ksx] jkseu la[;k,a vkfn dk lapkyuA

ü- lqanj izLrqrhdj.k ds fu;e **10**

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lkj.kh Vkbi djus dh fof/;kaA

Part–II – Computer Application **10**

(Details given in English Syllabus)

1. Basic Concepts of Computers. **4**
2. Operating Systems. **3**
3. Word Processing. **3**

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PRACTICAL

Time: 3 Hours ***Marks: 70***

Part–I - Vad.k foKku (fgUnh) & O;kogkfjd (Practical)

1- cSBus dh lgh fLFkfr fl[kkuk vkSj Vad.k ds egRo] xfr ,oa 'kq¼rk ds ckjs esa le>kukA
dqathiVy dk lapkyu Li'kZ fof/ ;k Vp eSFkM ls fl[kkukA
vk/kj iafDr ,oa ijh iafDr dk lgh vH;kl djkukA
fuEu iafDr ,oa la[;k iafDr ,oa fiQV dqath dk lapkyuA
xfr c<+kuk vkSj 'kq¼rk ij è;ku nsukA

2- gkf'k;s yxkuk] ck,a] nk;sa gkf'k;s yxkuk] iafDr varj.k djuk] 'kh"kZd]
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3- lkj.kh;u & lkj.kh Vkbi djuk] dkWye cukuk] mudk lSfVax djukA
lk/kj.k ;k O;fDrxr i=k Vkbi djuk vkSj lgh ist esa iQkWjesV djukA

Part–II – Computer Application (Practical)

To perform practical work on Computer according to the contents of the syllabus. After learning the Computer theory and commands, practical tasks will be performed in English or Hindi.

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समय : 3 घंटे *पर्णांक : 70*

1- 200 'kCnksa dk ;k 1000 LVksDl dk ,d vuqPNsn 20 'k-iz-fe- dh xfr ls 10 feuV rd VkbijkbVj@daI;wVj ij Vkbi djuk gksxkA **20**

2- O;fDrxr ;k vkosnu&i=k dks lgh izk:Ik esa 20 feuV esa daI;wVj ij Vkbi djuk gksxk vkSj mls Ýykih] lhMh ;k iSu Mªkbo ij lso djds mldk fizaV ysuk gksxkA **20**

3- igys ls miyC/ iQkbyksa dks <wa<dj muesa ifjorZu ;k la'kks/u djuk gksxkA **20**

4- Okkf"kZd O;kogkfjd dk;Z dh iQkby j[kuh gksxh ftls ns[kdj ijh{kd iznku djsxkA **10**

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CLASS–XI
OPTIONAL
SECRETARIAL PRACTICE AND ACCOUNTING (605)
THEORY

Time: 3 Hours ***Marks: 60***

1. Introduction **10**

Definition of secretary, Types of secretaries.

2. Secretarial Work **10**

Nature and Importance, Scope of secretarial duties, Qualifications of a secretary.

3. Accounting Work of a Secretary — 10

Definition of Accounting and need, Terms used in accounting, Rules of debit and credit.

4. Banking Transactions — 15

Different types of bank accounts, Opening and operation of a bank account, Kinds of Cheques, Demand Draft, Mail Transfer, Telegraphic Transfer, Travellers' Cheques.

5. Postal Services — 15

- Ordinary Mail.
- Registered Mail.
- Speed Post.
- Money Order.
- Postal Orders.
- V.P.P.

PRACTICAL

Time: 2 Hours ***Marks: 40***

1. Practice of Routine Secretarial Duties — 10

- Doing receptionists work.
- Attending to visitors / callers.
- Attending to incoming telephone calls.
- Noting appointments of the employer.
- Making railway reservation / air booking.

OR

- Routine duties in School Office.

2. Using Source of Information — 10

- Telephone Directory.
- Railway Time Table.
- Flight Schedules of airways.
- Post Office Guide.
- Ready Reckoner.

3. Finding Job of Secretary / Assistant Secretary — 10

- Selecting suitable jobs advertised in newspaper columns.
- Making application for jobs.
- Preparing for interview.
- Preparing letter of acceptance, letter of joining, relieving letter.
- Handing over and taking over charge.

4. Use of Postal Services — 10

- Mailing Registered and Registered/Insured Covers.

- Despatch of V.P.P. Mail.

CLASS–XI
OPTIONAL
OFFICE COMMUNICATION (606)
THEORY

Time: 3 Hours ***Marks: 60***

1. Introduction — 15

- Meaning of communication.
- Importance.
- Communication Modes: Oral and Written.
- Scope: Internal and External.
  Local, National-level, International.
- Media of communication.

2. Oral Communication — 15

- Face to face communication.
- Use of Telephone.
- Types of telephone facilities.
  Local, Inland trunk service.
  S.T.D. and I.S.D.
  Inter-com systems/Direct line with extensions.

3. Written Communication — 15

- Internal Communication
  (Notices/Circulars/Office Memo/Letters).
- External Communication
  (Notices/Circulars/Advertisements/Letters).
- Telegraphic Communication
  Use of Tele printers and Fax machines.

4. Report Writing — 15

- Meaning and importance of reports.
- Types of reports.
- Writing of reports - Procedure.
- Content of reports - Form and Arrangement.
- Contents of reports - Form and Arrangements.

PRACTICAL

Time: 2 Hours ***Marks: 40***

1. Telephone Handling Practice

- Making Calls, Receiving calls,
  Taking messages, Transferring calls.
- Making complaints for faults and follow up.

2. Preparing Reports based on

- Available factual information.
- Based on enquiry and investigation of facts.
- Based on survey of individual opinion.

3. Drafting Notices, Circulars and Office Memos on the Basis of given Information.

GUIDELINES FOR PRACTICAL EXAMINERS

Word – A Sample Case Study

Create a resume of about one page long similar to the one shown below considering points a to j, for a BA (Pass) graduate from Allahabad University looking for a Operator's job.

Shimpi Sherwal
A-22, Vikas Vihar, Delhi 110099
Ph: 23999999 Mobile: 981111111
shimpisherwal@kmail.com

Objective:	Assignment as Computer Operator.
Education:	B.A. (Pass), Allahabad University (2007). Six month Diploma in Computer. Applications, Quick Type Institute, Saket, New Delhi. (2008).
Work Experience	
July 2007 – Jan 2008:	Successfully completed internship as an operator in Pickloo Associates.
Jan 2008 – Mar 2008:	Worked with the Daily Typo mints as Computer Operator.
Skills:	Fluent in Typing English, Hindi and French, 50 wpm typing speed. **Knowledge of Photoshop, PageMaker, Word.**
Personal Information	
Marital Status:	Single.
Date of birth:	22-Mar-1986.
Appearance:	Pleasant looking.
References:	On request.

(a) Set the top, bottom, left and right margins of page to 1" each.

(b) Use tab stops inserted at 0 and 3 inches on the ruler.

(c) Set the font of entire resume to Arial 12 points, Name, postal address, email address to Arial 14 points.

(d) Bold face the Name, postal address and email address.

(e) Left Align the resume except the Name, Postal address and email address.

(f) Align the top lines of the resume which show the name, postal address and Email address of the person.

(g) Under the Work Experience heading, use tab stops to make the content readable.

(h) Under the Work Experience heading, boldface and underline the text "Knowledge of Photoshop, PageMaker, Word." To make it stand out.

(i) Insert a picture of the applicant in the top left or top right corner of the resume.

(j) Check the entire resume for any spelling or grammatical errors.

Excel – A Sample Case Study

Prepare an analytical result sheet of Terminal Test of your class in the format given below.

A	B	C	D	E	F	G	H
UNIT TEST							
Name	**English**	**Office Pp**	**Accountancy**	**Stenography**	**Computer Applications**	**Total Marks**	**Percentage**
Akriti	78	65	77	88	76	----	----
Charu	77	98	90	66	99	----	----
Gouri	67	78	87	56	84	----	----
Riya	81	91	98	77	100	----	----
Highest	----	----	----	----	----	----	----
Lowest	----	----	----	----	----	----	----

1. Calculate the total marks obtained by each student in the next column (column G).
2. Calculate the Highest and Lowest marks obtained in each subject.
3. Also calculate the aggregate/percentage marks obtained by each student (column H).
4. Give the number of students appearing for COMPUTER APPLICATIONS test.

Note: Name the relevant ranges and use these range names for calculating the above mentioned formula values.

Power Point – A Sample Case Study

The CEO of Pricta Bull Limited is visiting India and China to procure iron ore mines. He is negotiating with the government for the purchase of the iron ore mines and is giving a presentation on behalf of the company showing its worth and updated technology to establish a steel plant. The Commercial, Finance, Commerce and External Affairs ministers are present as an audience along with topple from other companies who have also come as competitors for the same.

Create a Slide Show having the Following

1. The profile of the company, its founders and shareholders.
2. A bar chart depicting the turnover of the company in the last 10 years.
3. Insert a picture of the factory and give animation effects.
4. Include speaker notes which the CEO will be using while delivering his presentation using Notes Page View.
5. You may include Rehearse Timings along with transition effects to make a stronger impact on the audience.
6. Create a master slide with the company logo, and use the same format for all subsequent slides.

Marking Scheme

Note:

1. For assigning the marks in practical speed test: First calculate the speed and then assign the marks to the candidate in relation to the net speed. To encourage higher speed and accuracy the minimum speed i.e. qualifying speed holder should get the minimum pass marks i.e. 33% of marks allotted for the test for example if the list carries 30 marks then pass marks is 10 for qualifying speed of 30 wpm.
2. Various norms or standards have been fixed for calculating the speed and marks system. Following method should be followed for calculating net speed and assigning marks.

Job – I:

Every mistake/error in Typewriting should be treated as Full Error. However, mechanical error can be ignored.

Count the Errors and Gross letters (Strokes) calculate the Net Speed and marks as under:

$$NS = \frac{GL - (\text{levied penalty}) \times EC}{5 \times T}$$

NS = Net Speed, GL = Gross letters, EC = Errors Committed, T = Time, levied penalty = 0 strokes for each error.

$$MO = MM \times \frac{NS}{QS} - QMP$$

MO = Marks obtained, MM = Maximum marks allotted for the speed test, NS = Net Speed, QS = Qualifying Speed, QMP = Qualifying marks penalty.

i.e. (maximum marks allotted for the test- qualifying marks).

Example–1:

Let GL = 2000 Strokes, EC = 10, T = 10 Minutes, MM = 30, QS = 30 wpm, Qualifying marks = 10, QMP = 30 – 10 = 20

GL – 20 X EC.

$$\text{Net Speed} = \frac{}{5xT}$$

$$NS = \frac{2000 - 20x10}{5x10} \quad \frac{2000 - 200}{5x10} = \frac{1800}{50} = 36\text{wpm}$$

Therefore marks obtained:

$$MQ = MM \times \frac{NS}{QS} - QMP = 36$$

$$= 30 \times \frac{36}{30} - 20$$

$$= 36 - 20 = 16 \text{ marks out of } 30$$

Example–2:

Let GL = 2065 strokes, EC = 14, T = 10 mts, MM = 30 QS = 30 wpm:

Qualifying marks = 10, QMP = 30 – 10 =20, levied penalty = 10 strokes per error.

$$NS = \frac{GL - \text{levied Penalty} \times EC}{5 \times T}$$

$$NS = \frac{2065 - 20 \times 14}{5 \times 10} = \frac{2065 - 280}{}$$

$$= \frac{1985}{50} = 39.7 = 40\text{wpm (say)}$$

$$MO = MM \times \frac{NS}{QS} - QMP = 40$$

$$= 30 \times \frac{40}{30} - 20 = 20 \text{ marks out of } 30$$

Job – II:

Deduct 1 mark for improper display, typing error and subtract the total from 10 and award the balance.

Job – III:

Deduct 1 mark for typing error, proof correction not carried out and subtract the total from 10 and award balance marks.

Job – IV:

Deduct 1 mark for improper calculating, totalling, typing error and subtract the total from 10 and award balance marks.

Job – V:

Deduct 1 mark for error in clipart and presentation.

Seasonal work file will be checked and signed by the Examiner.

Note:

While preparing the speed test paper, counting of strokes should be shown at the end of each line. Every shift key operation, Tabular bar, space bar should also be counted along with every depression of the letter/sign/figure/adjustment key essential for typing the matter, 5 Strokes constitute a word. Levied penalty means penalty of 20 strokes for each Error in speed typing.

LIST OF RECOMMENDED BOOKS (TYPEWRITING)

1.	English Typewriting Instructor & Office Manual.	Dr. G. D. Bist
2.	Typography.	Dr. G. D. Bist
3.	Typing Test Guide.	Dr. G. D. Bist
4.	Principles of Typewriting.	By S. S. Sangal and D. P. Bhatia, Pitman Shorthand School
5.	Typewriting Speed & Accuracy.	By. O. P. Kuthiala
6.	Manual for Typists and Stenographers.	By Dr. P. Raizada

CLASS–XI

GENERAL FOUNDATION COURSE (501)

(Common for Office Secretaryship, Stenography & Computer Application, Accountancy & Taxation, Marketing & Salesmanship, Retail, Financial Market Management and Business Administration)

Time: 3 Hours ***Marks: 100***

Part–I: (Compulsory to all Vocational Courses) *Marks: 50*

A. Business Management and Entrepreneurship 30

(a) **Entrepreneurship Orientation** **5**
Importance and relevance in real life: Emphasis on self employment.

(b) **Entrepreneurship Values and Attitudes** **5**
Innovativeness, Independence, Risk Taking, Analytical ability.

(c) **Entrepreneurial Motivation** **5**
Achievement Planning, personal efficacy, entrepreneurial goal setting.

(d) **Launching of a Business Venture** **15**

Identification of project, steps in setting up a business, information about various institutions providing assistance, project formulation.

B. Computational Skills **10**

(a) Percentage, ratio & proportion, profit & loss, discount, simple and compound interest, population growth and depreciation of value of articles using logarithm. **6**

(b) Area and volume: rectangle, parallelogram, circle, cube, cone, cylinder & sphere. **4**

C. Environmental Education **5**

(a) Environment and the society.

(b) Environment properties risks in different economic enterprises, in use of raw materials, in processing / manufacturing and designing.

(c) Poverty and environment.

D. Rural Development **5**

(a) Agriculture, the back bone of Indian Economy.

(b) Rural development projects in India including Integrated rural development programme.

(c) Agro based rural industries.

(d) Community approach to rural development.

Part–II *Marks: 50*

1. Communication **20**

Meaning, Importance, means of written and oral communication, requisite of good communication.

2. Computer Awareness **10**

Introduction to computers, uses of computers in different fields, hardware, software, input and output devices.

3. Elementary Book–Keeping and Accountancy **10**

Double entry system, basic knowledge of books of accounts and final accounts.

4. Typewriting **10**

Typewriter, essential parts and keyboard operation.

CLASS–XII
ELECTIVE
OFFICE PROCEDURES & PRACTICES (604)

(Common for Office Secretaryship and Stenography & Computer Application)

THEORY

Time: 3 Hours ***Marks: 60***

Unit-1: Mail and Document Handling **10**

- Meaning & Importance of Mail, Centralization and Decentralization of Correspondence.
- Handling Inward and Outward Mail.
- Mail room Equipment – sorting table, rack, Letter opening machine, Postal Franking Machine, Mailing.
- Scale, Post Office Guide.

- Services rendered by Postal Department – Registered, Ordinary, Insured, Business Reply Card, Certificate of Posting, Speed Post, Post Bag, Post Box, Telegrams.

Unit-2: Filing and Indexing **10**

- Meaning and Importance of Filing.
- Essentials of good filing system.
- Classification of Files.
- Centralized and Decentralized system of filing.
- Modern methods of filing: Horizontal, Vertical, Suspension and Lateral.
- Weeding of old records.
- Meaning, importance and types of indexing.

Unit-3: Office Machines **10**

- Advantages and disadvantages of mechanization.
- Factors in selecting office machines.
- Different types of machines: Typewriter, Stencil, Duplicator, Copy Printer, Photocopier, Dictaphone, Cash Register, Note Sorting and Counting Machine, Time Recorder, CCTV, Laptop, Answering Machine, Computer, Mobile.

Unit-4: Office Communication **20**

- (4.1) Need and Importance of Communication.

  Oral Communication: Telephone Etiquettes, Noting of telephone message, Handling telephonic calls, phonograms, use of telephone directories and yellow pages, EPABX system.
- (4.2) Written Communication.
- Business Correspondence.

  Essentials of Business Correspondence.

  Structure of Business letter.

  Types of business letter – Enquiry, Quotation, Placing an order, Payment, Complaints and Adjustments.
- (4.3) Electronic Communication.

  Fax (Facsimile), E-mail and Internet.

Unit-5: Meetings **10**

- Meaning and requisites of a valid meeting.
- Drafting of Notice, Agenda and Minutes of Meetings.
- Terms used in the conduct of meeting-quorum, proxy, adjournment, motion, amendment and resolution, Casting vote, Poll.
- Secretarial duties before, during and after a meeting.

PRACTICAL

Time: 2 Hours ***Marks: 40***

Note: The Practical should be as near as the actual work performed in the office.

Job-1: Mail and Document Handling **5**

Making entries in Inward/Outward Mail Register, Use of letter opener, time and date stamp, Receiving & sorting mail department wise, distributing mail, preparation of envelopes, attaching enclosures, folding & inserting of letters, weighing & stamping, entering in peon book, preparation of railway and postal parcels.

Job-2: Filing & Indexing **5**

Keeping office files alphabetically, using numeric filing system, Arranging office files subject wise, geographically, searching a particular file from a filing cabinet, preparing Book index for all equipments and material kept in an office.

Job-3: Practice on the following Machines **5**

Photocopier, FAX, Franking machine, Duplication machine, Dictaphone, laptop, e-mailing.

Job-4: Communications **5**

Drafting of the following business letters.

Letter of Enquiry, quotation, letter placing an order and letter of complaint.

Job-5: Meetings **5**

Drafting of Notice, Agenda and Minutes of a meeting.

Job-6: Viva and File Work **15**

LIST OF RECOMMENDED BOOKS

1.	Text Book of Office Management.	:	by W. H. Leffingwel
2.	An outline of Secretarial Practice and Office Management.	:	by P. K. Ghosh
3.	Office Correspondence & Management.	:	by B. N. Tandon
4.	Office / Secretarial Practice.	:	Dr. G. D. Bist
5.	dk;kZy; i¼fr	:	MkWú xksikynÙk fc"V
6.	Office Procedure and Practice-I.	:	NCERT
7.	Office Management and Secretarial Practice.	:	V. P. Singh

CLASS–XII
ELECTIVE
TYPOGRAPHY & COMPUTER APPLICATION (ENGLISH) (607)

(Common for Office Secretaryship and Stenography & Computer Application)

THEORY

Time: 2 Hours ***Marks: 30***

Part-I: Typography

Correspondence **5**

Business: Different styles of letters – indented, semi indented and blocked.

Official: Office Memorandum, office order, DO letter and Office Note.

Manuscript **5**

Proof correction signs.

List of standard abbreviations.

Part-II: Computer Applications

Excel 8

Excel Overview: Starting with Excel, understanding worksheets/spreadsheet and workbooks, entering worksheet data – entering text, entering numbers and formulas, entering dates and times. Navigating between spreadsheets. Opening a Workbook, Saving a workbook and printing a Worksheet / Workbook.

Editing Excel: Worksheets/Spreadsheets – selecting cells, Editing cell contents, Inserting and deleting cells, Inserting and deleting rows and columns, working with worksheet ranges. Using cut, copy and paste options, clearing data.

Using Formulas and Functions: Using arithmetic operators, using range names in formulas, using relative and absolute cell referencing, copying formulas. Using auto sum for efficiency, common functions – sum (), average (), max(), min(), count(), countif(), counta(). Using paste function.

Using Special Tools: Spell checking, auto correct worksheets, finding and replacing data, using autofill, adding comments.

Formatting Worksheets: Center aligning, left aligning, right aligning and justifying cell content, row and column height, changing width and font, Making format changes, Auto formatting worksheets, modifying styles, additional formatting options – special alignment, special cell borders, special cell shades, protecting cells. Conditional formatting, tab colors help separate worksheets.

Using Charts: Creating custom charts (graphs) – choosing the chart type, selecting data for chart, modifying the chart. Making a quick, presentable and easily interpretable chart.

Power Point 4

Power Point Presentations: Understanding presentations and slides, creating a new presentation – the auto content wizard and presentation design, creating presentations using design templates.

Editing and Arranging Presentations: Using the outline – adding and importing new items, promoting and demoting elements, Using the slide sorter view, using the notes page view. Saving and printing.

Power Point Advanced Features: Modifying presentations, editing individual slides – putting comments in your presentations, adding text and text boxes, moving and rotating text. Adding pictures.

Animating your Presentations: Using Power Point's slide show – timed transitions, transition effects, setting up shows, rehearsing slide show, Voice narration, using action buttons, introducing animation schemes, customizing animation.

Internet and Security 8

Finding information from the web using popular Internet search engines like Google, Yahoo, Rediff, Lycos, Indiatimes, e-Commerce and e-Business.

Email

E-mails Management: Opening e-mail accounts using popular sites offereing free email services like Yahoo, Google, Rediffmail, Indiatimes, Hotmail etc., composing a message, formatting text, selecting the e-mail message format, add a signature, sending and receiving emails with/without attachment, reading email, replying to email, printing an email, deleting email, forwarding an email, creating folders/labels for archiving emails.

Computer Virus

Computer Virus: Computer virus, computer virus versus biological virus. Virus classification – boot sector virus, companion virus, e-mail virus, logic bomb, macro virus, cross-site scripting virus, Worm and Trojan, Effects of computer virus, the vulnerability of operating systems to virus, protection from virus and use of popular antivirus software.

PRACTICAL

Time: 3 Hours ***Marks: 70***

1. Key Board Operations – Speed Test of 30 wpm – 10 minutes 20

(300 words/1500 strokes)

Inculcation of Accuracy in key boarding skills for typing a paragraph by using Typing Tutor software. Minimum benchmark for accurate typing is the speed of 30 words per minute.

2. Proof Corrections / Correspondence — 10

One manuscript of 200 words containing 10 proof correction signs.

OR

One Official/Business letter of 180-200 words in MS word.

3. MS Excel — 15

Creating a spreadsheet with at least 5-6 columns and 6-8 rows including main heading, column headings, calculations (max, min, sum, average, or simple arithmetic operations), formatting and page setting, saving and printing the Spreadsheet.

4. MS Power Point — 10

Creating a presentation with at least 7-8 slides including Bulleted points, Insertion of Picture/Clip Arts, Slide Transition Effects and Custom Animations, saving and printing the presentation.

5. Practical File — 10

Should contain at least 10 printouts of spreadsheets and 10 printouts of presentations created over the year verified by the Teacher/Instructor concerned to be shown to the external examiner at the time of final practical examination.

6. Viva — 5

LIST OF RECOMMENDED BOOKS

1.	Text Book of Office Management.	:	by W. H. Leffingwel
2.	An outline of Secretarial Practice and Office Management.	:	by P. K. Ghosh
3.	Office Correspondence & Management.	:	by B. N. Tandon
4.	Office / Secretarial Practice.	:	Dr. G. D. Bist
5.	dk;kZy; i¼fr	:	MkWú xksikynÙk fc"V
6.	Office Procedure and Practice-I.	:	NCERT
7.	Office Management and Secretarial Practice.	:	V. P. Singh

LIST OF RECOMMENDED BOOKS (TYPE WRITING)

1.	English Typewriting Instructor & Office Manual	Dr. G. D. Bist
2.	Typography	Dr. G. D. Bist
3.	Typing Test Guide	Dr. G. D. Bist
4.	Principles of Typewriting	By S. S. Sangal and D. P. Bhatia, Pitman Shorthand School
5.	Typewriting Speed & Accuracy	By. O. P. Kuthiala
6.	Manual for Typists and Stenographers	By Dr. P. Raizada

CLASS–XII
ELECTIVE
TYPOGRAPHY & COMPUTER APPLICATION (HINDI) (609)
(Common for Office Secretaryship and Stenography & Computer Application)

THEORY

Time: 2 Hours ***Marks: 30***

Part–I – Vad.k foKku (Typography) – Theory

1- i=k&O;ogkj & O;kolkf;d ,oa 'kkldh; i=k] i=k Vkbi djus dh fof/;ka& O;fDrxr] O;kolkf;d ,oa 'kkldh; i=kksa esa varj] i=kksa ds Hkkx] 'kkldh; ,oa v¼Z&'kkldh; i=k] v'kkldh; fVIi.kh] Kkiu] vf/lwpuk vkfn ds izk:iA **5**

2- dkcZu izfrfyfidj.k ,oa LVsafly dkVuk ,oa cgqizfrfyfidj.k& fofHkUu izdkj ds dkcZuksa ds iz;ksx] LVsafly dk iz;ksx] LVsafly dkVus esa visf{kr lko/kfu;ka ,oa v'kqf¼;ksa dk lq/kkj] LVsafly ls cgqizfrfyfidj.k] iQksVksdkih e'khu vkfn ls izfrfyfidj.kA **2**

3- ik.Mqfyfi Vkbi djuk ,oa la'kks/u fpg~uksa dk iz;ksx & la'kksf/r ik.Mqfyfi ,oa la'kksf/r lkexzh Vkbi djus ls iwoZ dh lko/kfu;ka] la{ksfir v{kjksa dk iz;ksxA **3**

Part–II – Computer Application – Theory **20**

(Details given in English Syllabus)

1. Spread Sheet. **8**
2. Power Point. **8**
3. Mail and Message system. **4**

ijh{kk ,oa ewY;kadu fof/ & ijh{kk cksMZ }kjk yh tk,xh ftlds nks Hkkx gksaxsA

PRACTICAL (व्यावहारिक)

Time: 3 Hours ***Marks: 70***

Part I – Vad.k foKku (Typography) – Practical (O;kogkfjd)

O;kogkfjd dk;Z lS¼kfUrd ikB~;ozQe ds vuqlkj djk;k tk,xk ftlesa nksuksa Hkkxksa dk lekos'k gksxkA jh{kk ,oa ewY;kadu fof/ & ijh{kk cksMZ ds ijh{kd }kjk fuEu dk;ks± esa yh tk,xh&

1- xfr ijh{kk U;wure 30 'kCn izfr feuV dh nj ls 10 feuV dh gksxh ftlesa de ls de 300 'kCn ;k 1500 LV^{a}ksd gksaxsA **20**

2- ,d O;kogkfjd ;k 'kkldh; i=k ftlesa yxHkx 200 'kCn gksaxs] lgh izk:i esa daI;wVj ij Vkbi djuk gksxk vkSj fizaV ysuk gksxkA (MS Word) **10**

3- ,d ikaMqfyfi ;k la'kksf/r lkexzh 10 la'kks/d fpg~uksa lfgr lgh Vkbi djuh gksxh lgh izk:Ik esaA **10**

4- 4&5 dkWye vkSj 6&8 iafDr;ksa dh LizsM 'khV ij xf.krh; iQkjewyksa ls rS;kj djuh gksxhA (Excel) **20**

5- ,d ikoj lokWbaV ij fDyi vkVZ ;k LykbM rS;kj djds fizaV ysuk gksxkA (Power Point) **10**

& O;kogkfjd dk;Z dh iQkby ck; ijh{kd dks fn[kkuh gksxhA

Note: The Evaluation will be done according to the set formulas in Typing speed, letter typing, manuscript etc. The formula for job 4 and 5 will be the same a applicable to job 2 or 3.

fgUnh VkbijkbfVax&ijh{kk ,oa ewY;kdau i}fr

dsoy ijh{kdksa ds fy, (d{kk&ûü)

समय : 3 घंटे *अंक : 70*

dk;Z&û % xfr ijh{kk & 10 feuV fu/kkZfjr xfr & 30 'k-iz-fe- xfr ijh{kk igys yh tk,xhA ml ds ckn vU; dk;Z fd, tk,axsA igys v'kqf¼;ka vafdr djsa] mudks fxusa vkSj fuEu fof/k (fof'k"V lw=k) ls xfr fudkysaA

$$\text{निवल गति} = \frac{\text{कुल स्ट्रोक} - 25 \mid \text{अशुद्धियां}}{5 \mid \text{समय}}$$ **30**

mnkgj.k ds fy, ;fn dqy LV^{a}ksd = 2000] v'kqf¼;ka = 20

$$\text{fuoy xfr} = \frac{2000 - 25 \mid 20}{5 \mid \text{समय } 50} = \frac{2000 - 500}{.50}$$

$$\frac{1500}{50} = 30 \text{ 'kCn izfr feuV}$$

fuoy xfr

izkIrkad fu/kZfjr vad X _____ vf/dre dVkSrh

U;wurd fu/kZfjr xfr

fu/kZfjr vad (Maximum Marks), fuoy xfr (Net Speed), U;wurd fu/kZfjr xfr (Qualifying Speed) vf/dre dVkSrh (Max. Marks – Qualifying mark).

uksV % Vad.k ijh{kk esa izR;sd v'kqf¼ iwjh fxuh tk,] tSls v{kj] vad] dkSek] fojke fpg~u iSjkxzkiQ Vkbi u djuk ;k xyr Vkbi djuk] v{kjksa@vadksa dk NwVuk] dsUnzh;dj.k u djuk] 'kCnksa ds chp varj u gksuk ;k vf/d varj gksukA e'khu [kjkch dks ekiQ fd;k tk ldrk gSA

dk;Z&ü %i=k O;ogkj&'kkldh; @ O;kolkf;d&yxHkx 200 'kCnksa dk izR;sd v'kqf¼ ds fy, ,d vad dkVsa] lq

dk;Z&ý %lkj.kh & 3&4 dkye] 5&6 iafDr;ka] 'kh"kZd lfgr & yxHkx 150 'kCn@vad % Vad.k v'kqf¼ ,oa dk

dk;Z&þ %ik.Mqfyfi Vkbi djuk & izwQ djsD'ku U;wure 10 fpg~uksa lfgr] 150 'kCn % izR;sd v'kqf¼ tks B

dk;Z&ÿ %okf"kZd dk;Z dk ewY;kdau ijh{kd }kjk fd;k tk,xk tks ijh{kkFkhZ }kjk fd, x, dk;Z dh iQkby ds ew

uksV % ijh{kd ijh{kk iz'u&i=k rS;kj djrs le; bu funsZ'kksa dk iw.kZ :Ik ls ikyu djsxkA xfr ijh{kk iz'u&i=k esa LV^{a}ksdksa dh fxurh djrs le; izR;sd dqath izgkj] tSls fizaV dqath] VSc ckj] leatu dqath (tks v{kj@'kCn dks Vkbi djus ds fy, vfuok;Z gks) dh Hkh fxurh djsxkA dqy LV^{a}ksd dks 5 ls foHkkftr djus ij 'kCn cusaxsA LV^{a}ksdksa dh fxurh djus ds dkj.k fgUnh esa Hkh fu/kkZfjr xfr 30 'k-iz-fe- dh xbZ gSA

laLrqfrr iqLrdksa dh lwph

1- nsouxjh VkbijkbfVax izf'k{kd & x`g ea=kky; Hkkjr ljdkj

2- Vad.k dyk & vkj- lh- dqfB;kyk

3- fgUnh VkbijkbfVax izf'k{kd rFkk dk;kZy; lgk;d & MkWú th-Mh- fo"V

4- fof'k"V Vad.k xfr vH;kl & MkWú th-Mh- fo"V

CLASS–XII
OPTIONAL
SECRETARIAL PRACTICE & ACCOUNTING (605)
THEORY

Time: 3 Hours ***Marks: 60***

1. Private Secretary — 15

Nature of Private Secretary's Job

Qualifications

Duties and Responsibilities

Daily Routine.

2. Secretary of an Association / Club — 15

Nature of job of the secretary

Qualifications

Duties and Responsibilities.

3. Meetings — 15

General Rules governing meetings

Preparation for meetings

Secretary's duties before, during and after the meeting.

4. Accouting Works — 15

Documents in use: Invoice, Bills

Debit and Credit Notes

Maintenance of Cash Book/Daily Cash Receipts and Cash Payments record, Recording bank Deposits and Withdrawals, Maintaining record of Imprest Cash, Reconciliation of Bank Pass Book.

PRACTICAL

Time: 2 Hours ***Marks: 40***

1. Drafting of Notice — 10

- Agenda.
- Minutes.

2. Use of — 10

- Photocopier.
- Calculating machines.
- Weighing machine.
- Franking machines.

3. Opening and Operating Bank Account — 10

- Filling in form for opening account.

- Filling in Paying-in-slips for local & outstation Cheques.
- Filling in forms for Bank Draft (D.D.), mail Transfer M.T.

4. Works in School Sanchayika **10**

Notes:

1. All the tasks/excercies given in the above said syllabus will be performed by the students during the session.
2. Office machine as indicated in the syllabus should be arranges if possible, in the school or office located in the school vicinity.
3. Students should be asked to open and operate a saving bank account in a local bank in their own names.

OR

4. They should be assigned duties in the school sanchayika.

CLASS–XII
OPTIONAL
OFFICE COMMUNICATION (606)
THEORY

Time: 3 Hours ***Marks: 60***

1. Collection of Information / Data **15**

Nature of data / information
Purposes of Collecting data
Sources of data: Primary and Secondary
Methods of data collection
Use of questionnaire
Classification and use of tables, charts and diagrams.

2. Uses of Charts and Diagrams for Presentation of Data **15**

Meaning of charts and diagrams
Importance
Types of graphic charts
Use of diagrams
Bar diagram
Pie diagram
Pictograms.

3. Office Correspondence – I **15**

Objectives of Correspondence, importance of Correspondence
Essentials of a Business Letter
Form and Arrangement
Form and Business letters

- Letters of Enquiry, Quotations and Orders
- Trade References
- Complaints and settlement
- Dummy letters.

4. Office Correspondence – II **15**

Letters of introduction and Credit Status
Letter of Credit
Banking letters
Circular letters
Public Relations letter
Letters to Editors
Applications for Employment
Official (Govt.) Correspondence.

PRACTICAL

Time: 2 Hours ***Marks: 40***

1. Conducting Sample Survey given the Objectives of the Survey Nature of Information Required 10

- Graphics charts.
- Pictograms.
- Bar diagrams.
- Pie diagrams.

2. Preparing the Following Charts and Diagrams to Scale, with the Help of given Data 10

- Graphics charts.
- Pictograms.
- Bar diagrams.
- Pie diagrams.

3. Drafting of Letters on the Basis of Information Given 20

- Letter of enquiry: Quotations, order.
- Trade references.
- Complaints and Settlement.
- Dummy letters.
- Letter of Credit.
- Banking letters.
- Public Relations letter.
- Circular letters.
- Letter to Editor.
- Application for employment.
- Letter to officials (Govt. Departments).

Notes:

1. All the task/exercises given in the above said syllabus will be performed by the students during the session.
2. Sessional marks will be awarded by the school concerned.

CLASS–XII

GENERAL FOUNDATION COURSE (501)

(Common for Office Secretaryship, Stenography & Computer Application, Accountancy & Taxation, Marketing & Salesmanship, Retail, Financial Market Management and Business Administration)

Time: 3 Hours *Marks: 100*

Part–I: (Compulsory to all Vocational Courses) *Marks: 50*

A. Business Management and Entrepreneurship 30

Management of Business

Elementary treatment/exposure to basic conceptual frame work of the topic listed below:

(a)= Basic Function. **6**

(b) Marketing Management. **6**

(c) Financial Management. **6**

(d) Production Management. **6**

(e) Personnel Management. **6**

B. Computational Skills 10

1. (a) Solution of linear equations and their application to problem of commercial mathematics. **5**

   (b) System of linear equations and in equation in two variables. Applications in formation of simple linear programming problems.

2. Statistics: Raw data, bar charts and Histogram; Frequency Tables; Frequency Polygon; Ogive; Menu, Median and Mode of ungrouped and grouped data; Standard Deviation; Introduction to Mortality tables; Price Index etc. Introduction to Computers. **5**

C. Environmental Education & Rural Development 10

1. **Environmental Education** **5**

   (a) Modernisation of agriculture and environment, irrigation, water logging, use of fertilisers, pesticides, soil erosion, land degradation (desertification and deforestation), silting and drying of water resources.

   (b) Rational utilisation, conservation and regeneration of environmental resources (soil, air, water, plant, energy, minerals).

2. **Rural Development** **5**

   Principles and goals of rural development, major problems/constraints in rural development in India.

Part–II *Marks: 50*

1. Economic Environment of Business 10

A brief exposure of economic and industrial policy, consumer protection.

2. Banking 8

Functions of Banks, types of accounts and their operation.

3. Advertising 8

Meaning, Importance and media.

4. Financial Services 8

Mutual funds, leasing, Elementary knowledge of stock market operations in India.

5. Postal Services 8

Various services provided by Post Office.

6. Purchasing and Storekeeping 8

Basic Principles of Purchasing and storekeeping.

LIST OF RECOMMENDED BOOKS

1.	Text Book of Office Management:	by W. H. Leffingwel
2.	An outline of Secretarial practice and Office Management:	by P. K. Ghosh.
3.	Business Methods and Machinery:	by Dr. A. N. Agarwal
4.	Computer for beginners:	by V. P. Jaggi and Sumanjain
5.	Programming in Basic:	by E. Balguruswamy
6.	Computer Fundamentals & Problem Solving:	by P. S. Grover
7.	Question Bank in Office Practice:	by Dr. P. Raizada, NCERT Publication.
8.	Exemplar Instructional Material on Office practice:	by Dr. P. Raizada, NCERT Publication.

SUGGESTED LIST OF TOOLS/EQUIPMENTS

1. **Mailing Room:** Franking machine, letter opener, weighing machine, addressing machine, dating machine, stapler, stapler opener.
2. **Filing and Indexing:** Filing cabinet, open racks, folder storage equipment (Remdex), punching machine, cardindex cabinet, strip index, cardex, graphdex.
3. **Duplicating and Copying:** Photostat, Duplicating machine (manual/electric), electronic stencil cutter, scanner, paper cutter.
4. **Communication:** Telephone with atleast two extensions, Intercom set PBX/ PBAX/EPABX, Telephone Directory, External Transmission Equipment.
5. **Machine Room:** Electronic Calculator (pocket as well as printer-cum-display), cash register (Registrex), Computers, word processor and accessories, franking machine, coins sorter, time recorder, postal weighing scale, tables for installing equipment, adding and calculating.

STENOGRAPHY AND COMPUTER APPLICATION

Employment Potential

1. Wage Employment

- Office Assistant/Clerk.
- Steno typist.
- Stenographer.
- Personal/Private Secretary/Assistant.
- Executive Assistant.
- Office Secretary/Assistant.
- LDC-Typist.

2. Self Employment

- Reprography Centre.
- Secretarial Practice Institute.
- Job Work for Advocates, Chartered Accountants.
- Agents, Consultants etc.

3. Employing Agencies

- Government Departments.
- Public Undertakings.
- Private Undertakings.
- Educational/Research Organizations.
- Associations/Clubs/Hotels/Trusts/ Councils.
- Professionals.
- Public Utility Services.

CLASS–XI
ELECTIVE
TYPOGRAPHY & COMPUTER APPLICATION (ENGLISH) (607)
(Common for Office Secretaryship and Stenography & Computer Application)

(Refer to page 5)

CLASS–XI
ELECTIVE
TYPOGRAPHY & COMPUTER APPLICATION (HINDI) (609)
(Common for Office Secretaryship and Stenography & Computer Application)

(Refer to Page 7)

CLASS–XI
ELECTIVE
SHORTHAND (ENGLISH) (608)
THEORY

Time: 2 Hours ***Marks: 30***

Unit-1: Introduction to Stenography and Brief History of Shorthand. **2**

- Origin of modern system, entry of Shorthand in India.
- Use of Shorthand in legislatures, equipments, ideal teacher.

Unit-2: Consonants – Definition, their Classification, Arrangement and Directions of Consonantal Strokes, Joining of Strokes. **3**

- Vowels – long & short, places, following and preceding, intermediate vowels, place of joined strokes and vowels.
- Short Forms – logograms, grammalogues & simple contractions, phrasing tick 'the' & Punctuation marks.
- Diphthongs – definition and places, trip thongs (3 vowels).

Unit-3: Alternative (Downward) Forms of R & L, RR & LR. **5**

- H stroke, H tick and dot, Upward stroke of Sh.
- Semi/circles of semi/vowels W&Y, diaphone and triphone.
- Phraseography (joining of words and short forms).

Unit-4: Circle – Small and Large Circles, S and Z Circles and Strokes, Places of VOWEL in circles, Circle and Stroke H, Circle and L. **5**

- Loops – small loop St/Sd and big loop Str loop and vowel.

Unit-5: Initial Hooks – R & L Hooks, Shr & Shl, use of Vowels with Hooked Stokes, Vowels and Double Consonants. **5**

- Alternative forms of hooked strokes – right and left curves of hooked F/V, Th/Three strokes, upward: Sh & hooks.

Unit-6: Compound Consonants-Definition, Initial Large Hooks of Whr, Whl, kw/Ky/Gw/Gy, Mp/mb Compound Stroke Consonants. **5**

- Final hooks – F/V & N hooks, hooks & circles or loops.
- Large final hook or SHUN hook, shun hook & curl for Shun.

Unit-7: Halving and Doubling Principle - Halving of Strokes for t/d: Halving of m, n, l, r for d, Halving of Mp/Mb/ng/Hooked Strokes. **5**

- Doubling of strokes of tr/dr, doubling of knp/mb/ng/strokes doubling of L strokes of L stroke for tr restrictions of halving and doubling.

Examination Scheme: Theory paper to be set by the School Examiner / Teacher covering the content given above, of Questions of short, medium and long Answers, for testing the knowledge, understanding and application of mind, acquired during the year.

PRACTICAL

Time: 3 Hours ***Marks: 70***

Practical: Practical to be performed according to the chapter scheme of English shorthand.

1. Practice of strokes vowels, their joining direction and shape according to the Work Book and the exercises from the text book, Practice of dipthongs and punctuation marks.
2. Practice of alternative forms of outline, their short forms, phrases, circles, loops, initial hooks, compound consonants, alternative curves, final hooks and shun hook.
3. Practice of words, short forms and phrases from the text book practice form the Work Book for testing the ability relating to the chapters and their exercises.
4. Practice of Halving and doubling principles, short forms, phrases Work book exercise and test exercises.
5. Practice of Writing letters, personal letters and their transcription on typewriter / Computer.

Examination Scheme: The School Examiner will conduct Practical Examinations in the following manner:

1. A Dictation of a passage of 5 minutes on the theory chapters studies by the student during the year up to halving and doubling principle. **30**
2. A Dictation of 5 minutes of short forms, words and phrases studies during the year. **30**
3. Practical Work file to be maintained and shown to the Examiner for evaluation/ awarding marks. **10**

CLASS–XI
ELECTIVE
SHORTHAND (HINDI) (610)
THEORY

समय : ü घंटे *अंक : ýú*

;wfuV

1- vk'kqys[ku dk mn~ns';] mn; vkSj fodkl] Hkkjr esa vk'kqfyfi dk pyuA **2**

- vk/qfud vk'kqys[ku&èofu fl¼kUr dk pyu] fiVeSau fl¼kUr dk fodklA
- fganh vk'kqfyfi dk fodkl ozQe ,oa ys[ku i¼fr;ksa dh miyfC/;kaA
- izf'k{k.k midj.k] izf'k{k.k rduhd ,oa vk'kqys[kd ds xq.kA

2-	)	vk'kqfyfi O;atuekyk& ifjHkk"kk,a] vkdkj&izdkjA	3
	)	O;atu js[kkvksa dh fn'kk,a ,oa vkdkj&izdkjA	
	)	Lojksa fo/ku] nh?kZ ,oa y?kq Loj] vxz ,oa lk'p LojA	
	)	Lojksa dk O;atuksa ij iz;ksx] ekè;fed Loj iz;ksxA	
	)	'kCn fpg~u] 'kCnk{kj ,oa laf{kIrk{kj] cgqopu dk iz;ksxA	
	)	f}Loj ,oa f=kLoj fpg~u ,oa mu ij vuqLokj lkz;ksxA	
	)	okD;ka'k fuekZ.k ,oa fozQ;k foHkfDr;ksa dk iz;ksxA	
3-	)	O;atuksa ds oSdfYid :iA	5
	)	roxZ O;atuksa ds oSdfYid ;k nk;sa pkiksa dk iz;ksxA	
	)	j] y] O;atuksa ds oSdfYid ;k v/kseq[kh iz;ksxA	
	)	v¼ZLoj ;] o ds v'o`Ùkksa dk fo/kA	
	)	O;atu g ds v/kseq[kh iz;ksx] fVd g ,oa fcUnq g dk iz;ksxA	
	)	v‰oZeq[kh O;atu js[kk 'ks"k ds iz;ksxA	
4-	)	o`Rrksa dk fo/ku NksVs o`Rr l ds iz;ksx] g O;atu ij o`Rr iz;ksxA	5
	)	o`Rr ,ao O;atu js[kkvksa ds iz;ksx ds fu;eA	
	)	cM+s o`Rr ds vkjafHkd] ekè;fed ,oa vafre iz;ksxA	
	)	pki ;k ywi dk iz;ksx] NksVs ywiksa ,oa cM+s ywi ds iz;ksxA	
	)	vuqukflD; ,oa vuqLokj ds fof'k"V iz;ksxA	
5-	)	vkjafHkd gqd ;k vadq'k dk iz;ksx ck,a ,oa nk,a :[k (eks'ku) ds iz;ksxA	5
	)	j ,oa y gqd ds fu;e] j] y gqdksa ds lkFk o`Rr l ds iz;ksx ds fu;eA	
	)	oozQ O;atuksa ds oSdfYid iz;ksx] Lojksa dk izdVhdj.kA	
	)	gqd ,oa eè;orhZ Lojksa dk iz;ksx] O;atuksa 'k ds lkFk j] y gqdksa ds iz;ksxA	
	)	'kCnksa dh iqujko`fRr ds iz;ksx ,oa fu;eA	
6-	)	la;qDr O;atu vFkok la;qDrk{kjksa dk izko/kuA	5
	)	vkjafHkd cM+s gqdksa ls cuus okys la;qDr O;atu & D;] Do] O;] g~o vkfnA	
	)	O;atu js[kkvksa dks eksVk djus ls fufeZr la;qDr O;atu j;] Y;] E;@Ec@EHkA	
	)	vafre gqdksa dk iz;ksx& u@iQ] ,oa ;@o gqdA	
	)	vafre CkM+s gqd 'ku gqd ds :lk ,oa lwphA	
7-	)	v¼Zdj.k ,oa f}xq.ku fl¼karA	5
	)	gYds ,oa xgjs O;atuksa dk v¼Zdj.k fu"ks/A	
	)	dqN O;atuksa dks eksVk ,oa vk/k djus ds fu;e] v¼Zdj.k okD;ka'kA	
	)	js[kkvksa dks nqxquk djus dh fof/A	
	)	f}xq.ku fu"ks/] f}xq.ku fl¼kar ds okD;ka'kA	

ijh{kk i¼fr & F;ksjh ijh{kk cksMZ }kjk yh tk,axh ftlds fy, fu/kZfjr ikB~;ozQe ls iz'u iwNs tk,axs tks y?kq] ekè;e ,oa nh?kZ mRrj okys gksaxsA lS¼kafrd ijh{kk 30 vadks dh gksxhA

PRACTICAL

समय : 3 घंटे *अंक : 70*

O;kogkfjd dk;Z vk'kqfyfi ds lS¼kfUrd ikBksa ds vuqlkj djk;k tk,xkA

;wfuV

1- lqanj] lgh lkbt] lgh fn'kk esa vk'kqfyfi dh uksV cqd ij vk'kqys[ku djkuk igyk y{; gksxkA

2- blds ckn Lojksa dk iz;ksx] f}Lojksa] f=kLojksa dk iz;ksx fl[kk;k tk,xkA 'kCn fpg~uksa] 'kCnk{kjksa ,oa muls cuus okys laf{kIrk{kjksa dk iz;ksx ,oa vH;kl xgu jhfr ls djk;k tk,xkA

3- dfri; js[kkvksa ds oSdfYid :iksa ,oa fn'kkvksa dk iz;ksx rFkk o`Rr] cM+s o`Rr] ywi vkfn dk vk'kqys[ku esa egRo ns[krs gq, lgh <ax ls vH;kl djk;k tk,xkA

4- fozQ;kvksa ds :i] vkjafHkd gqd] la;qDr O;atu] vkfn dk xgu vH;kl ikBksa ds vuqlkj djk;k tk,xkA gj vH;kl dh fMDVs'ku nsdj mudks gj Nk=k ls i<+okus dk vH;kl djk;k tk,xkA gj vH;kl dh fMDVs'ku dk izfrys[ku VkbijkbVj ;k dEI;wVj ij djk;k tk,xkA

5- vafre gqdksa ds ikBksa ds lkFk js[kkvksa dks vk/kk djus ;k nqxquk djus ds fu;eksa dk xgjkbZ ls vH;kl djk;k tk,xkA fu;fer :Ik ls ikBksa dh fMDVs'ku cksydj mudks i<+us ,ao muds izfrys[ku djds mu ij v'kqf¼;ksa dh x.kuk dh tk,sxhA fu;fer vH;kl ds bu izfrys[kukas dh iQkby j[kh tk,xh ftuds vk/kj ij ijh{kd }kjk Nk=kksa dks vad iznku fd, tk,axsA

;g è;ku esa j[kk tk, fd lgh vH;kl ls gh vk'kqfyfi dh O;kogkfjd ijh{kk ds fu/kkZfjr y{; izklr fd, tk ldrs gSaA

O;kogkfjd ijh{kk & i<+k, x, ikBksa ds vk/kj ij O;kogkfjd ijh{kk dk iz'ui=k cksMZ dk ijh{kd rS;kj djds yk,xk ftlesa rhu dk;ks± dh ijh{kk,a gksaxhA

समय : 3 घंटे *अंक : 70*

dk;Z

1- fMDVs'ku 40 'kCn izfr feuV dh xfr dk 5 feuV dk gksxk ftls VkbijkbVj ;k daEiwVj ij Vkbi fd;k tk,xkA **30**

2- 'kCn&fpg~u] 'kCnk{kj ,oa muls cuus okys laf{kIrk{kjksa ds lkFk okD;ka'k fy[kus dk ,d fMDVs'ku gksxk ftlesa yxHkx 20 'kCn izR;sd [kaM ds gksaxs ftUgsa VkbijkbVj ;k daEiwVj ij Vkbi fd;k tk,xkA **30**

3- izf'k{kkFkhZ }kjk d{kk es fd, x, O;kogkfjd dk;Z dh iQkby j[kh tk,xh ftls ckg~; ijh{kd ns[kdj viuk ewY;kdau djds vad iznku djsxkA **10**

uksV % ewY;kdau ,oa vadu ;kstuk i`"B ‒ ij nh xbZ gSA

CLASS–XI
OPTIONAL
OFFICE PROCEDURES & PRACTICES (604)
(Common for Office Secretaryship and Stenography & Computer Application)

(Refer to page 3)

CLASS–XI
ELECTIVE
GENERAL FOUNDATION COURSE (501)

(Common for Office Secretaryship, Stenography & Computer Application, Accountancy & Taxation, Marketing & Salesmanship, Retail, Financial Market Management and Business Administration)

(Refer to page 14)

CLASS–XII
ELECTIVE
TYPOGRAPHY & COMPUTER APPLICATION (ENGLISH) (607)

(Common for Office Secretaryship and Stenography & Computer Application)

(Refer to page 17)

CLASS–XII
ELECTIVE
TYPOGRAPHY & COMPUTER APPLICATION (HINDI) (609)

(Common for Office Secretaryship and Stenography & Computer Application)

(Refer to page 19)

CLASS–XII
ELECTIVE
SHORTHAND (ENGLISH) (608)

THEORY

Time: 2 Hours ***Marks: 30***

Unit-1: Revision of Basic Theory **5**

- Initial and final hooks, compound consonants, halving and doubling principle.

Unit-2: Prefixes and Suffixes **5**

- Definition, use of dot prefixes, Suffixes – dot suffix and dash suffix, use of strokes for representation of suffixes.

Unit-3: Intersections **5**

- Cutting of strokes for official and colloquial phrases, representation of round numbers and monetary units; their representative strokes.

Unit-4: Contractions **5**

- Special contractions, Part I to Part IV, special phrases and foreign words, phrases for judiciary, executive and legislature.

Unit-5: Transcription Aids and Accurate Writing **5**

- Position of outlines, similar outlines of different works, Essential vowels and accurate writing, Writing proper nouns, aspirated sounds, nasal vowels.

Unit-6: Use of Audio Cassettes for Writing Dictations at Graded Speeds of 60-80-100 wpm. **5**

- Phrases and short forms, transcription of dictations on computer, transcription of letter writing dictations, in proper format.

Examination Scheme: Theory Paper is to be set by the Board, consisting of Short Answers, medium and Long Answers.

PRACTICAL

Time: 3 Hours ***Marks: 70***

1. Revision of Basic theory from initial and final hooks should be done by daily practical (Dictation and Transcriptions on typewriter/ computer, from workbook Exercises.
2. Practice A Prefixes and Suffixes should be done by Dictation and Reading of shorthand Notes from Workbook and test Exercises.
3. Practice of Intersections of Strokes to be done by repetitive Dictation and transcription, from.
4. Contractions to be Practise daily by dictation, copying and reading Exercises of Text books Workbooks and Practice Books.
5. Use of Audio Cassettes/CDS Writing Dictations at the Speeds of 80-100 WPM and Transcribing them on computer.

Examination Scheme: The practical will be conducted by the Board Examiner according to the following standards:

1.	One Dictation of 80 w.p.m. unseen for 5 minutes (400 words).	**30**
2.	One Dictation of 60 w.p.m. of a business letter for 3 minutes of About 180-200 words.	**15**
3.	One Diction of an official letter for 3 minutes (60 wpm) of about 180-200 words.	**15**
4.	Practical Sessional work File to be shown.	
5.	Examiner for awarding Marks.	**10**

PRACTICAL FOR EXAMINERS ONLY

(Five copies of the question paper to be given to each Centre)

Time: 3 Hours ***Marks: 70***

Job - I: **35**

One Dictation of 400 words at the speed of 80 wpm for 5 minutes. (Reading & Transcription time: 30 minutes. After completing the 1st Job, collect the Answer sheets. (Job II and III should be dictated together with a gap of 2 minutes).

Job - II: **35**

One Dictation of 400 words at the speed of 80 wpm for 5 minutes. (Reading & Transcription time: 30 minutes) After completing the 1st Job, collect the Answer sheets. (Job II and III should be dictated together with a gap of 2 minutes).

Note:

1. Job II and II should be completed in an hour.
2. Examiner should give two trials of one minute each to the students before start of real passage.

MARKING SCHEME

Job - I: Count the Total Mistakes/Errors:

Full Mistakes/Errors: Omission/addition of any letter/word/figure, substitution of any word/figure/letter in place of dictated word/figure/letter. Mark the errors by a cross (X) sign above the line.

Half Mistakes/Errors: Spelling mistake, on use/wrong use of full stop/question mark, wrong/non-capitalisation of proper nouns, Mark the half error by a 0 above the line.

Total Errors = No. of Full errors + ½ (No. of half errors).

$$\text{Marks Obtained} = \frac{\text{Max. Marks - EC (Errors Committed) x OPM (Qualifying Penalty Marks)}}{\text{EA (Errors Allowed)}}$$

(for 10 mistakes 400 words / EA 20).

$$X\frac{(30 - 10) \times 20}{20} = \text{marks out of 30 marks}$$

Job - II: For every full error deduct 1 mark and deduct the total from 15 and award the balance marks. Display errors should also be counted as full mistakes in letters. Fraction of total marks should be ignored.

Job - III: For every full error deduct 1 mark and deduct the total marks from 15 Fraction of total marks should be ignored. Errors of proper display should be counted as full mistakes.

The Examiner should evaluate the Sessional work of the students and award marks of 9/6/3 according to Grade A/B/C respectively.

The Evaluation Scheme is based on 33% qualifying marks prescribed by the C.B.S.E.

LIST OF RECOMMENDED BOOKS

1.	Pitman Shorthand Instructor (New Era Edition).	Issac Pitman
2.	Work Book on Shorthand, Dictation & Correspondence .	By Dr. G. D. Bist
3.	Simple Pitman Shorthand (with Key).	By Dr. G. D. Bist
4.	Speedography (1100 Phrases & Dictations).	By Dr. G. D. Bist
5.	Simple Speed Guide & Dictation Exercises.	By Dr. G. D. Bist
6.	Model Speed Dictations in 4 Volumes.	By Dr. G. D. Bist

CLASS–XII
ELECTIVE
SHORTHAND (HINDI) (610)
THEORY

समय : 2 घंटे *अंक : 30*

1.) izFke lesLVj ds vafre eq[; ikBksa dk iqujh{k.k ,ao nzqr vè;;uA **10**
) vkjafHkd gqd] la;qDr O;atu] vafre gqdksa dk iz;ksx o xgu vè;;uA
) v¼Zdj.k fu;e ,oa muds 'kCnk{kj] laf{kIrk{kj ,oa okD;ka'kA
) f}xq.ku fu;e ,oa muds 'kCnk{kj ,oa okD;ka'kks dk xgu vè;;uA
2.) milxZ ,oa izR;; & milxZ dh ifjHkk"kk ,oa muds :iA **5**
) Loj v dk milxZ ds :Ik esa iz;ksx] dqN O;atu js[kkvksa ds :iA
) milxks± dh izfrfuf/ js[kk,aA
3.) izR;; 'kCn ,oa 'kCn [k.M & ifjHkk"kk ,oa :iA **5**

- izR;; js[kkvksa ;k fpg~uksa ds iz;ksx ,oa mudh izfrfuf/ js[kk,a ,oa :iA
- milxZ ,oa izR;; ds :Ik esa iz;ksx gksus okys 'kCn :IkA

4. - O;atu js[kkvksa ij dkV & inuke okd~;ka'kA **5**
   - inuke okd~;ka'kksa dh izfrfuf/ js[kk,a ,oa dkVus dh fof/A
   - vfr mi;ksxh lkEkkU; okD;ka'kks dk fuekZ.k ,oa js[kk,aA
   - la[;k,a ,oa eqnzk,a izdV djus dh fof/k;ka ,oa muds okD;ka'kA

5. - fof'k"V laf{kIrk{kj & O;atu js[kkvksa dk yksiA **5**
   - fof'k"V laf{kIrk{kjksa ds [kaM 1 ls 5
   - lkekfld ;k tqV 'kCnksa dk iz;ksxA
   - foijhrkFkZd ;k foykse 'kCn] vo/kj.k ;k iqu:fDrA
   - jkT; ,oa dsUnz 'kkflr izns'kksa dh lwph] fnu(okj)] x`g] u{k=k ,oa eklA

ijh{kk i¼fr & cksMZ }kjk F;ksjh dk iz'u rS;kj djk;k tk,xk ftlesa y?kq] eè;e rFkk nh?kZ mRrj okys iz'u gksxsaA F;ksjh ;k lS¼kafrd iz'ui=k 30 vadksa dk gksxkA

PRACTICAL

समय : 3 घंटे *अंक : 70*

- xgu izf'k{k.k dk;Z&fMDVs'ku ,oa vk'kqys[kksa dks i<+okukA
- v¼Zdj.k ,oa f=kxq.ku js[kkvksa ds okD;k'ka] foHkkxh; 'kCnkofy;ksa ds okD;ka'kA
- fMDVs'ku esa uksV fy[kuk ,oa mudh vuqfyfi djukA
- iqLrd dh fMDVs'ku 60&80 'kCn izfr feuV ij fy[kdj izfrys[ku djukA
- i=kys[ku ds vH;kl vkSj mudh vuqfyfi lgh izLrqrhdj.k fof/ ls djukA
- vkWfM;ks dSlVksa ls 80 ,oa 100 'kCn izfr feuV ds fMDVs'ku fy[kdj mudh VkbijkbVj ;k daI;wVj ij lgh :Ik esa vuqfyfi djukA
- v'kqf¼;ksa dk fujkdj.k dj 'kq¼rk ykukA

O;kogkfjd dk;Z lS¼kfUrd ikBksa ds vè;;u dze ds vuqlkj djk;k tk,xkA izR;sd ikB ds 'kCnksa] 'kCn&fpg~uksa] 'kCnk{kjksa ,oa vH;klksa dk xgu vH;kl djk;k tk,xkA izR;sd izf'k{kkFkhZ dks O;kogkfjd dk;Z dh iQkby rS;kj djuh gksxh ftlesa fu;fer dk;Z dk jsdkMZ j[kk tk,xk vkSj ckg~; ijh{kd ds le; ewY;kadu ds fy, izLrqr djuk gksxkA

iqLrd ds vH;kl lekIr gksus ij xfrys[ku funsZ'kdk dk iz;ksx fd;k tk,xk ftlesa ls lHkh ikBksa ds eq[; va'kksa ds lS¼kfUrd fu;eksa ds vuqlkj vk'kqys[ku fd;k tk lds vkSj fo'ks"k 'kCnksa dh lwph] milxZ&izR;;] okD;k'kksa vkfn ds vH;kl ds ckn fMDVs'ku fy[ks tk,axs vkSj mudk izfrys[ku fd;k tk,xk rkfd 'kq¼rk ,oa xfr'khyrk ykbZ tk ldsA

ijh{kk i¼fr & O;kogkfjd ijh{kk cksMZ ijh{kd }kjk yh tk,xh ftlesa rhu dk;Z gksxsaA

समय : 3 घंटे *पणार्क : 70*

dk;Z

1- 80 'kCn izfr feuV dh xfr dk fu/kZfjr ikBksa ds vuqlkj rS;kj fd;k x;k fMDVs'ku tks feuV dk gksxk VkbijkbVj ;k daI;wVjksa ij Vkbi djuk gksxkA **30**

2- 60 'kCn izfr feuV dh xfr dk 160 'kCnksa dk ,d O;fDrxr ;k vkosnu i=k dk fMDVs'ku ftls VkbijkbVj ;k daI;wVjksa ij lgh fof/ ls Vkbi djuk gksxkA **15**

3- 60 'kCn izfr feuV dh xfr dk 180 'kCnksa dk ,d O;fDrxr ;k 'kkldh; i=k dk fMDVs'ku fy[kk;k tk,xk ftls daI;wVj ij lgh fof/ ls Vkbi djuk gksxkA **15**

4- O;kogkfjd dk;Z dh iQkby dk ewY;kdau ckg~; ijh{kd }kjk fd;k tk,xkA **10**

ADDITIONAL (OPTIONAL) SUBJECTS

1. **Secretarial Practice And Accounting**
   Class XII

2. **Office Communication**
   Class XII

laLrqfrr iqLrdksa dh lwph

1- fof'k"V vk'kqfyfi (izf'k{kd)A

2- Ekkud vk'kqfyfi & x`g ea=kky; Hkkjr ljdkjA

3- Ekkud mPpxfr vH;kl & x`g ea=kky; Hkkjr ljdkjA

4- dksbZ Hkh ekfld 'kkVZgSaM if=kdkA

5- lalnh; fMcsV~lA

List of Equipment (Stenography)

1. Typewriter (Hindi/English).
2. Electronic Typewriter Bilingual/Computer.
3. Copy Holder.
4. Stop Watch.
5. Tool Kit.
6. Cassette Recorder and Player (with 1 Doz Cassettes).
7. Blackboard with rulings.
8. Wall clock with centre second.
9. Charts of consonants, grammalogues.

dsoy ijh{kdksa ds fy, d{kk ûü
vk'kqfyfi fgUnh&ijh{kk ,oa ewY;kadu i}fr

ewy Jqfrys[ku ls iwoZ 1 & 1 feuV ds nks Jqfrys[k ijh{kkfFkZ;ksa ls djk, tk,axsA

1- ,d Jqfrys[ku 5 feuV dk] 80 'k-iz-fe- dh xfr ls dqy 400 'kCnksa dk (Jqfrys[k i<+us ,oa VkbZi ds fy, fu/kZfjr le; & 50 feuV) dk;Z% 1- iwjk djus ds ckn gh dk;Z 2- vkSj dk;Z 3- fy, tk,axsA 10 feuV vkjke ds cknA **30**

2- ,d O;fDrxr vFkok 'kkldh; i=k tks yxHkx 300 'kCnksa dk gksxk] 5 feuV esa cksyk tk,xk] 60 'k-iz-fe- dh xfr lsA **15**

3- ,d O;fDrxr ;k O;kolkf;d i=k tks yxHkx 300 'kCnksa dk gksxk] 5 feuV esa cksyk tk,xk] 60 'k-iz-fe- dh xfr lsA **15**

uksV % dk;Z 2 vkSj dk;Z 3 dk fMDVs'ku ,d lkFk fn;k tk,xk fdUrq chp esa 5 feuV dk vkjke fn;k tk,xk vkSj bu dks i<+us rFkk Vkbi djus ds fy, dqy ,d ?kaVs dk le; fn;k tk,xkA

4- ijh{kd izR;sd izf'k{kkFkhZ }kjk fd, x, okf"kZd O;kogkfjd Jqfrys[kksa dh iQkby ns[ksxk vkSj muds ewY;kadu ds vk/kj ij ozQe'k% ,@ch@lh Js.kh nsxkA **10**

ewY;kadu i¼fr

1- igys v'kqf¼;kafxuh tk,aA v'kqf¼;ka fuEu izdkj l fxuh tk,axh &

iw.kZ v'kqf¼ & iwjh v'kqf¼ fxusa ;fn dksbZ v{kj@'kCn@vad NwV tk, ;k vfrfjDr Vkbi fd;k tk,] vFkok cksys x, 'kCn@ vad ds LFkku ij nwljk 'kCn@vad Vkbi fd;k x;k gksA bls 'kCn ds ij xq.kk fpg~u (X) }kjk izdV djsaA

vk/h v'kqf¼ & izR;sd orZuh@Lisfyax dh v'kqf¼] okD; ds ckn iw.kZ&fojke ;k iz'u okpd u yxkus ij vk/kh v'kqf¼ fxusa vkSj bls ,d 'kwU; (0) ls izdV djsaA
dqy v'kqf¼;ka = iw.kZ v'kqf¼;ka + + ½ (vk/h v'kqf¼;ka) (v/wjh la[;k dks NksM+sa)

vc fof'k"V lw=k ds vuqlkj vad nsaA

dqy v'kqf¼;ka = naMkad (10 x 20)

izkIrkad = fu/kZfjr vad & $\frac{\text{Lohdk;Z v'kq}}{\text{20}} = 30 - \frac{\text{\_\_\_\_\_}}{\text{\_\_\_\_\_}} = 20$

2- izR;sd v'kqf¼ ds fy, ,d vad dkVsaA i=kys[ku esa lqanj izLrqrhdj.k ds fu;eksa dh v'kqf¼;ksa dks Hkh fxudj vad dkVsaA naM Lo:i dkVs x, vad 15 esa ls ?kVkdj vad iznku djsaA

3- izR;sd v'kqf¼ ds fy, ,d vad dkVsa vkSj dqy dkVs x, vad 15 esa ls ?kVkdj vad iznku djsaA

4- okf"kZd dk;Z dk ewY;kadu ijh{kd ,@ch@lh Js.kh nsdj ozQe'k% 9@6@3 vad nsxkA

uksV % ;g ewY;kadu i¼fr 33 izfr'kr vad izkIr djus okys izf'k{kkFkhZ dks mRrh.kZ ?kksf"kr djus ds vk/kkj ij rS;kj dh xbZ gSA lHkh dk;ks± ds izkIrkadksa ds vk/kkj ij ghs izf'k{kkFkhZ mRrh.kZ@vuqRrh.kZ ?kksf"kr fd;k tk,xkA

CLASS–XII
OPTIONAL
OFFICE PROCEDURES & PRACTICES (604)
(Common for Office Secretaryship and Stenography & Computer Application)

(Refer to page 15)

CLASS–XII
GENERAL FOUNDATION COURSE (501)
(Common for Office Secretaryship, Stenography & Computer Application, Accountancy & Taxation, Marketing & Salesmanship, Retail, Financial Market Management and Business Administration)

(Refer to page 24)

LIST OF EQUIPMENTS

1. Typewriter (Hindi/English).
2. Electronic Typewriter Bilingual / Computer.
3. Copy Holder.
4. Stop Watch.
5. Tool Kit.
6. Cassette Recorder and Player (with one dozen cassettes).
7. Blackboard with rulings.
8. Wall clock with centre second.
9. Charts of consonants, Grammalogues.
10. Computer.
11. Printer.
12. Fax Machine.

ACCOUNTANCY & TAXATION

Introduction

The course is designed to enable students to develop conceptual, skill and application skill in the commerce related field. The course will familiarize students with current business process and practices. This will help students in developing capabilities to identify business opportunities, analyze their risk- return possibilities and support business development in socially desirable avenues with strong moral commitment.

CLASS–XI
ELECTIVE
COST ACCOUTING (781)
THEORY

Time: 3 Hours ***Marks: 60***

1.	General Principles.	**12**
2.	Direct Materials.	**12**
3.	Direct Labour and Direct Expenses.	**12**
4.	Overheads General - Classification, Distribution and Control.	**12**
5.	Overheads Distribution.	**12**

1. General Principles **12**

- Meaning and Scope of Cost Accounting.
- Objectives of Cost Accounting.
- Cost Accounting Versus Financial Accounting.
- Importance of Cost Accounting.
- Objections to Cost Accounting.
- Elements of Cost.
- Components of Total Cost.
- Classification of Costs.
- Installation of a Costing System.
- Methods of Costing.
- Techniques of Costing.
- Systems of Costing.

2. Direct Materials — 12

- Materials Control.
- Purchasing of Materials.
- Receiving of Materials.
- Inspection of Materials.
- Storage of Materials.
- Issuing of Materials.
- Maintenance of Inventory Records.
  - (i) Incoming Materials.
  - (ii) Outgoing Materials.

3. Direct Labour and Direct Expenses — 12

- Direct and Indirect Labour.
- Control over Labour Costs.
- Personnel Department.
- Engineering and Works Study Department.
- Time-keeping Department.
- Pay-master's Department.
- Cost Accounting Department.
- Treatment of Holiday Pay, Idle Time, Overtime etc. in Cost Accounts.
- Labour Turnover.
- Direct Expenses.

4. Overheads - Control — 12

- Classification of Overheads.
- Comments on Certain Items of
  - (i) Factory Overheads.
  - (ii) Office and Administrative Overheads.
  - (iii) Selling and Distribution Overheads.

5. Overheads - Distribution — 12

- Overheads Distribution Stages.
- Distribution of Factory Overheads.
- Distribution of Office and Administration Overheads.
- Actual Versus Pre-determined Overhead Rates.
- Over and Under-absorption of Overheads.

PRACTICAL

Time: 2 Hours ***Marks: 40***

(30 marks for report and 10 marks for viva-voice)

The students will be required to prepare reports for an organization in respect of the following:

- Cost sheet of the firm for a selected period.
- Maintenance of Bin Cards.
- Maintenance of Stores Ledger.
- Treatment of Material Losses.
- Recording Attendance Time.
- Recording Job Time.
- Treatment of Material Losses.
- Classification and Codification of Different Items of Overheads.

CLASS–XI
ELECTIVE
TAXATION (782)
THEORY

Time: 3 Hours ***Marks: 60***

Unit-1: Introduction to Income Tax & important Definitions. **10**

Unit-2: Exempted Incomes and Residential Status & Incidence of Tax Liability. **20**

Unit-3: Heads of Income: **30**

(i) Income from Salary.

(ii) Income from House Property.

(iv) Income from Business Profession.

(v) Income from Other Sources.

PRACTICAL

Time: 2 Hours ***Marks: 40***

1. Computation of Income under different heads. **20**
2. Viva-Voce. **20**

CLASS–XI
OPTIONAL
FINANCIAL ACCOUNTING (780)
(Common for Accounting & Taxation and Financial Market Management)

THEORY

Time: 3 Hours ***Marks: 80***

1.	Meaning and Scope of Accounting.	**6**
2.	Accounting Principles.	**6**
3.	Journalizing Transactions.	**6**
4.	Ledger Posting and Trial Balance.	**6**
5.	Sub-Division of Journal.	**6**
6.	Negotiable Instruments.	**6**
7.	Bank Reconciliation Statement.	**6**
8.	Capital and Revenue.	**6**
9.	Final Accounts.	**8**
10.	Rectification of Errors.	**6**
11.	Depreciation Provisions and Reserves.	**6**
12.	Accounts of Non-Profit Making Organizations.	**6**
13.	Single Entry System (Final Accounts from Incomplete Records).	**6**

1. Meaning and Scope of Accounting — 6

- Need for Accounting.
- Development of Accounting.
- Definition and Functions of Accounting.
- Book-keeping and Accounting.
- Is accounting a ‘Science’ or an ‘Art’.
- End Users of Accounting Information.
- Accounting and Other Disciplines.
- Role of Accountants.
- Branches of Accounting.
- Objectives of Accounting.
- Outsourcing of Accounting Function.
- Accounting as an Information System.

2. Accounting Principles — 6

- Meaning of Accounting Principles.
- Accounting Standards and International Accounting Standards Committee/Board.
- Accounting Principles and the Institute of Chartered Accountants of India.
- IFRS - Convergence in India.

- Systems of Book-Keeping.
- Systems of Accounting.

3. Journalising Transactions — 6

- Journal.
- Rules of Debit and Credit.
- Compound Journal Entry.
- Opening Entry.

4. Ledger Posting and Trial Balance — 6

- Ledger.
- Posting.
- Relationship between Journal and Ledger.
- Rules regarding Posting.
- Trial Balance.
- Voucher System.

5. Sub-division of Journal — 6

- Cash Journal.
- Petty Cash Book.
- Purchases Journal.
- Sales Journal.
- Sales Returns Journal.
- Purchases Returns Journal.

6. Negotiable Instruments — 6

- Promissory Note.
- Bill of Exchange.
- Cheque.
- Accounting Entries.
- Bills Sent for Collection.
- Accommodation Bills.
- Bills Receivable and Payable Books.

7. Bank Reconciliation Statement — 6

- Advantages of Keeping a Bank Account.
- Causes of Difference.
- Meaning and Objective of Bank Reconciliation Statement.
- Importance of Bank Reconciliation Statement.
- Technique of preparing Bank Reconciliation Statement.
- Where Causes of Differences are given.

- Where Cash Book Balance has to be Adjusted.
- Where Abstracts from Cash Book and Pass Book are Given.

8. Capital and Revenue — 6

- Classification of Income.
- Classification of Expenditure.
- Classification of Receipts.

9. Final Accounts — 8

- Trading Account.
- Profit and Loss Account.
- Manufacturing Account.
- Balance Sheet.
- Adjustment Entries.
- Work Sheet.

10. Rectification of Errors — 6

- Learning Objectives.
- Classification of Errors.
- Location of Errors.
- Suspense Account.
- Rectifying Accounting Entries.
- Effect on Profit.

11. Depreciation, Provisions and Reserves — 6

- Concept of Depreciation.
- Causes of Depreciation.
- Basic Features of Depreciation.
- Depreciation, Depletion, Amortization and Dilapidations.
- Meaning of Depreciation Accounting.
- Objectives of Providing Depreciation.
- Fixation of Depreciation Amount.
- Methods of Recording Depreciation.
- Methods for Providing Depreciation.
  - (i) Fixed Installment Method.
  - (ii) Diminishing Balance Method.
  - (iii) Change of Method of Depreciation.
- Disposal of Asset.
- Provisions and Reserves.

12. Accounts of Non-Profit Making Organisations — 6

- Receipts and Payments Account.

- Income and Expenditure Account.
- Balance Sheet.
- Items Peculiar to Non-Trading Concerns.
- Preparation of Income and Expenditure Account and Balance Sheet from Receipts and Payments Account.
- Preparation of Balance Sheet from Receipts and Payments Account and Income and Expenditure Account.

13. Single Entry System (Final Accounts from Incomplete Records) **6**

- Meaning.
- Salient Features.
- Disadvantages.
- Computation of Profit.
- Net Worth Method.
- Conversion Method.

PRACTICAL

Time: 1 Hour ***Marks: 20***

Visit a Sole Proprietary Firm and Present Reports Regarding:

1. Preparing & Posting Vouchers through Tally Software. **5**
2. Preparation of its Bank Reconciliation Statement. **5**
3. Preparation of its Final Accounts for a particular period. **10**

CLASS–XI
GENERAL FOUNDATION COURSE (501)

(Common for Office Secretaryship, Stenography & Computer Application, Accountancy & Taxation, Marketing & Salesmanship, Retail, Financial Market Management and Business Administration)

(Refer to page 14)

CLASS–XII
ELECTIVE
COST ACCOUNTING (781)
THEORY

Time: 3 Hours ***Marks: 60***

1. Single or Output Costing. **10**
2. Job Costing and Batch Costing. **10**
3. Contract Costing. **10**
4. Process Costing. **10**
5. Operating Costing or Service Costing. **10**
6. Reconciliation of Cost and Financial Accounts. **10**

1. Single or Output Costing **10**

- Components of Cost for Output Costing.
- Cost Sheet.
- Production Account.
- Treatment of Stock and Scrap.

2. Job and Batch Costing — 10

- Job Costing.
- Objectives.
- Procedure.
- Batch Costing.
- Nature and Use of Batch Costing.
- Determination of Economic Batch Quantity.

3. Contract Costing — 10

- Specific aspects of Contract Costing.
- Profit on Incomplete Contracts.
- Profit on Completed Contracts.

4. Process Costing — 10

- General Principles.
- Process Losses and Wastage.
- By-Products and Joint-Products.

5. Operating or Service Costing — 10

- Meaning of Operating Costing.
- Determination of Unit of Cost.
- Transport Costing.
- Power House Costing.
- Canteen Costing.

6. Reconciliation of Cost and Financial Accounts — 10

- Causes of Difference.
- Preparation of Reconciliation Statement or
- Memorandum Reconciliation Account.

PRACTICAL

Time: 2 Hours ***Marks: 40***

(30 marks for report and 10 marks for viva-voice)

I. Prepare a Project Report on Operating Costing or Service Costing of any organization viz., transport, hotel, canteen or any other service organization.

II. Visit a Manufacturing Organization to report based on actual data.

- Treatment of Process Losses.

- Reconciliation of Costing and Financial Profit.

LIST OF RECOMMENDED BOOKS

1. Maheshwari & Mittal: Cost Accounting – Theory and Problems – Shri Mahavir Book Depot.
2. Shukla & Grewal: Cost Accounting – S. Chand & Sons.

CLASS–XII
ELECTIVE
TAXATION (782)
THEORY

Time: 3 Hours ***Marks: 60***

Unit-1: Deductions from Gross Total Income. **10**

Unit-2: Computation of Tax Liability of an Individual. **20**

Unit-3: TDS and Advance Payment of Tax. **10**

Unit-4: Introduction to Indirect Taxes.

Meaning and Classification:

I. VAT/CST - Scope, Interstate and Intrastate Sales, Objectives, Benefits, Limitations, Various Forms under CST. **10**

II. Service Tax. **10**

- Background.
- Nature of Service Tax.
- Service Provider and Receiver.
- Value of Service.
- Negative List under Service Tax.
- Procedure.
  - (i) Registration.
  - (ii) Billing.
  - (iii) Payment.
  - (iv) Returns.

PRACTICAL

Time: 2 Hours ***Marks: 40***

1. Filling of Income Tax Returns. **10**
2. Filling of Service Tax Returns. **10**
3. Viva. **20**

CLASS–XII
OPTIONAL
FINANCIAL ACCOUNTING (780)
(Common for Accounting & Taxation and Financial Market Management)

THEORY

Time: 3 Hours *Marks: 80*

1.	Fundamentals.	**7**
2.	Reconstitution of Partnership Firms-I.	**8**
3.	Reconstitution of Partnership Firms-II.	**8**
4.	Dissolution of a Partnership Firm.	**8**
5.	The Joint Stock Company.	**7**
6.	Shares and Share Capital.	**7**
7.	Debentures.	**7**
8.	Company Final Accounts.	**7**
9.	Financial Statements: Analysis and Interpretation.	**7**
10.	Funds Flow Statement.	**7**
11.	Cash Flow Statement.	**7**

SECTION – I: PARTNERSHIP ACCOUNTS

1. Fundamentals — 7

- Meaning of Partnership.
- Essential Characteristics of Partnership.
- Partnership Deed.
- Final Accounts.
- Adjustments after Closing Accounts.
- Fixed and Fluctuating Capitals.
- Good will.
- Joint Life Policy.
- Change in Profit Sharing Ratio.

2. Reconstitution of Partnership Firms – I — 8

- Admission of a Partner.
- Accounting Problems.

3. Reconstitution of Partnership Firms – II (Retirement, Death and Amalgamation) — 8

- Retirement of a Partner.
- Death of a Partner.
- Amalgamation of Partnership Firms.

4. Dissolution of a Partnership — 8

- Distinction between Dissolution of Partnership and Dissolution of a firm.
- Modes of Dissolution of a Firm.
- Settlement of Accounts.
- Accounting Entries.
- Insolvency of Partners.

SECTION – II: COMPANY ACCOUNTS

5. The Joint Stock Company — 7

- Introduction.
- Meaning and Definition of a Company.
- Essential Characteristics of a Company.
- Kinds of Companies.
- Difference between Company and Partnership.
- Distinction between Private and Public Limited Companies.
- Formation of Company.
- Allotment of Shares.

6. Shares and Share Capital — 7

- Shares.
- Share Capital.
- Accounting Entries.
  - (i) Full Subscription.
  - (ii) Under subscription.
  - (iii) Oversubscription.
- Calls in Advance.
- Calls in Arrears.
- Issue of Shares at Premium.
- Issue of Shares at Discount.
- Forfeiture of Shares.
- Surrender of Shares.
- Issue of Two Classes of Shares.

7. Debentures — 7

- Classification of Debentures.
- Issue of Debentures.
- Different Terms of Issue of Debentures.
- Writing Off Loss on Issue of Debentures.

8. Company Final Accounts — 7

- Books of Account.
- Introduction to Company Final Accounts.
- Formats of Financial Statements: Schedule III (Companies Act 2013).
- Familiarity with the Items of Financial Statements.

  (Preparation of Company Financial Statements is not required).

9. Financial Statements: Analysis and Interpretation — 7

- Meaning and Types of Financial Statements.

- Nature of Financial Statements.
- Limitations of Financial Statements.
- Analysis and Interpretation of Financial Statements.
- Steps involved in the Financial Statement Analysis.
  - (i) Methodical Classification.
  - (ii) Ratio Analysis.
- Advantages of Ratio Analysis.
- Limitations of Ratio Analysis.

10. Funds Flow Statement 7

- Meaning of Funds Flow Statement.
- Uses of Funds Flow Statement.
- Funds Flow Statement vs Income Statement.
- Treatment of Provision for Taxation and Proposed Dividends.

11. Cash Flow Statement 7

- Meaning of Cash Flow Statement.
- Uses of Funds Flow Statement.
- Treatment of Provision for Taxation and Proposed Dividends.

PRACTICAL

Time: 1 Hour ***Marks: 20***

Visit a Sole Proprietary Firm and present Reports regarding:

Collect and go through.

- A Partnership Deed. **5**
- Share Certificate & Debenture Certificate of a Company. **5**
- Annual Accounts of a Company. **10**

CLASS–XII
GENERAL FOUNDATION COURSE (501)

(Common for Office Secretaryship, Stenography & Computer Application, Accountancy & Taxation, Marketing & Salesmanship, Retail, Financial Market Management and Business Administration)

(Refer to page 24)

LIST OF EQUIPMENTS AND SOFTWARE

1. **Computers:** One per two students.
2. **Printer:** Laser Printer One for twenty students.
3. **Software:** Tally / ERP / SAP - Preference for SAP & Multi-user Licence.
4. **Manual for Various Software / Assorted Reference Books:** One for ten students.
5. **Demonstration Stand:** One for ten students.

6. **Computer Consumable Stationery:** (i) A-4 Size twenty sheets per students.

(ii) Toner for one laser printer for printing 1,000 pages.

7. **LCD Projector:** One for a class of twenty students.

MARKETING AND SALESMANSHIP

CLASS–XI
ELECTIVE
MARKETING (783)
THEORY

Time: 3 Hours ***Marks: 60***

S. No.	Unit	Session	Marks Allotted
1.	**Introduction to Marketing**	) Meaning, Nature, Objectives, Scope & Importance of Marketing.) Difference between Marketing & Selling.) Marketing Philosophies.	**12**
2.	**Marketing Environment**	) Meaning and Importance.) Macro Environment Factors.) Micro Environment Factors.	**10**
3.	**Marketing Segmentation, Targeting & Positioning**	) Meaning & Importance of Segmentation.) Bases of Market Segmentation.) Meaning and Need for Targeting.) Types of Targeting.) Meaning & Need for Positioning.) Positioning Strategies.	**13**
4.	**Fundamentals of Marketing Mix**	) Meaning and Importance of Marketing Mix.) Marketing Mix Components – Service Sector & Consumer Goods.	**10**
5.	**Consumer Behaviour**	) Meaning and Importance of Consumer Behaviour.	**15**

		⟩ Factors Affecting Consumer Buying Behaviour. ⟩ Roles of Buying Behaviour. ⟩ Stages of Buying Behaviour.	

PRACTICAL

Time: 2 Hours ***Marks: 40***

(Any three of the following)

1. Visit to retail and wholesale stores located nearby and prepare report on the Frequency and volume of sale of selected products of different categories to Customers classified by age and sex.
2. Ascertain from the local market of selected consumer goods to what extent Economic, Social and Cultural factors affect the demand for particular goods, Prepare report.
3. Conduct household or market survey and report on the buying motive of Consumers as regards to price and quality, consumers being classified by Age, sex and income, given certain selected products.
4. Survey of demand for selected products available under different brand names through household enquiries in the local area.
5. Taking any two brands of your choice, collect the following market information.
   (a) Segments for which they are made.
   (b) Competitors brands.
   (c) Marketing mix information – information about its price, ways of promotion, ways of distribution.

CLASS–XI
ELECTIVE
SALESMANSHIP (784)
THEORY

Time: 3 Hours ***Marks: 60***

S. No.	Unit	Sessions	Marks Allotted
1.	**Salesmanship**	⟩ Meaning & Importance of Personal Selling. ⟩ Function & Types of Personal Selling. ⟩ Introduction to Salesmanship. ⟩ Qualities of effective Sales person.	**15**
2.	**Essentials of Sales**	⟩ Knowledge of Industry and Company. ⟩ Knowledge of Products. ⟩ Knowledge of Customer.	**12**
3.	**Preliminary Stages of Personal Selling Process**	⟩ Prospecting: Meaning, Importance, Characteristics for qualifying as a prospects and methods of prospecting. ⟩ Pre-approach: Meaning, Importance and sources of information. ⟩ Approach: Meaning, Importance & Methods.	**15**

4.	**Advance Stages of Personal Selling Process**	) Demonstration & Presentation: Concepts & Essential features of Good Presentation and Demostration.) Objection Handling: Understanding Objections, Procedure for Handling Objections.) Closing Sale: Features and methods of Closing Sale.) After sale Services: Concepts and importance of after Sale Service.	**18**

PRACTICAL

Time: 2 Hours ***Marks: 40***

1. Identify from newspaper column's the jobs of salesman advertised and the qualification desired.
2. Interview managers of organizations located nearby and ascertain the qualities of salesmen considered for appointment. Prepare reports.

CLASS–XI
GENERAL FOUNDATION COURSE (501)

(Common for Office Secretaryship, Stenography & Computer Application, Accountancy & Taxation, Marketing & Salesmanship, Retail, Financial Market Management and Business Administration)

(Refer to page 14)

CLASS–XII
ELECTIVE
MARKETING (783)

THEORY

Time: 3 Hours ***Marks: 60***

S. No.	Unit	Sessions	Marks Allotted
1.	**Product**	) Meaning & Importance of Product.) Classification of Product.) Product Life Cycle – Concept & Stages.) Role of Packaging & Labeling.	**10**
2.	**Price Decision**	) Meaning and Importance of Price.) Factors Affecting Pricing.) Types of Pricing.	**10**
3.	**Place Decision: Channels of Distribution**	) Meaning & Importance of Place.) Types of Distribution.) Factors affecting the choice of Channels of Distribution.) Functions of intermediaries.	**16**
4.	**Promotion**	) Meaning & Need of Promotion.	**12**

		) Elements of Promotion Mix.) Factors affecting the selection of Promotion.	
5.	**Emerging Trends in Marketing**	) Service Marketing.) Online Marketing.) Social Media Marketing.	**12**

PRACTICAL

Time: 2 Hours ***Marks: 40***

Note: Unit No. 4 is compulsory and any two units out of Unit No.1, 2 and 3 may be allotted for practical. In total only three units are to be allotted to a student.

1. Market survey of selected consumer products on the basis of brand name and package. Collection of data and preparing report on the popularity of different brands and popularity and quality of packages of the products, and reasons thereof.
2. Making enquiries from wholesalers and retailers to study and report on the channels of Distribution of selected products.
3. Visiting Departmental store/retail, shop or consumer co-operative store located nearby to Study and report on the functioning of the store or shop.
4. Screening advertisements in newspapers/magazines, and through radio and TV Programmes and reporting on the differences in appeal of different media of advertising.

CLASS–XII
ELECTIVE
SALESMANSHIP (784)
THEORY

Time: 3 Hours ***Marks: 60***

S. No.	Unit	Sessions	Marks Allotted
1.	**Sales Organization**	) Introduction to Sales Organization.) Functions and Factors affecting Sales Structure.) Classification of Sales Organization.	**10**
2.	**Inside Selling / Store Based Selling**	) Understanding In-store Selling Environment.) Types of Stores.) Salesman as a Facilitator.) Sales Career In-store Based Selling.	**15**
3.	**Field Selling**	) Sales Territories: Purpose and Design of Territories.) Sales Quotas: Need and Types of Sales Quotas.) Activities in Field Selling.) Sales Career in Field Selling.	**20**

4.	**Motivation & Compensation for Salesperson**	⟩ Components of Motivation. ⟩ Compensation Rewards. ⟩ Non-Compensation Rewards.	**15**

PRACTICAL

Time: 2 Hours ***Marks: 40***

1. Role playing by each student as salesman with some other student playing the role of customer. Teacher concerned to assess the performance and external examiner to give his award on the basis of oral questions.
2. Preparation of sales presentation plan by each student on the basis of selected products to be sold and type of customers to be called upon.
3. Ascertaining through interview of outdoor Salesman (living or working nearby) the important steps which they follow in sales presentation and preparation of report thereon.

CLASS–XII
GENERAL FOUNDATION COURSE (501)

(Common for Office Secretaryship, Stenography & Computer Application, Accountancy & Taxation, Marketing & Salesmanship, Retail, Financial Market Management and Business Administration)

(Refer to page 24)

LIST OF RECOMMENDED BOOKS

1. Text book of salesmanship: Mac Graw Hill Ltd. (Indian Edition).
2. Frederic A, Russell, Frank H. Baach.
3. Selling - The Personal: A Wiley & Hilton publication Authors force in marketing W.J.E. Crissy, William H. Conningham, Isabella C.M. Conningham.
4. Salesmanship and Publicity: Dr. Rustom S. Davar.
5. Progressive Corporation Pvt. Ltd. Bombay.
6. Salesmanship: D.B. Taraporevala Sons & Co. Pvt. Ltd. Bombay.
7. Salesmanship: M. Satyanarayan.
8. Sales Management and Vara & Co. Publ. Bombay Advertising.
9. Principles of Marketing: J.C. Sinha & Salesmanship R. Chand & C. Delhi.
10. Marketing & Salemanship: S. A. Sherleka Himalaya Publishing House.
11. Marketing: N. Rajan Nair.
12. Sultan Chand & Sons - Delhi.
13. Salesmanship and Publicity: J.S.K. Patel, Sultan Chand & Sons - Delhi.
14. Marketing, Salesmanship: C.N. Santakki and R.G. Deshpande and Advertising Ravi Chandra Publication.
15. Salesmanship: Grant Master.
16. Modern Principles & Practice. Hall, New Delhi.

LIST OF EQUIPMENTS AND SOFTWARE

1. Computers.

2. Printers.
3. Software.
4. Manual for Various Software / Assorted Reference Books.
5. Demonstration Stand.
6. Computer Consumable Stationery.
7. LCD Projector and Screen.

BANKING & INSURANCE

CLASS–XI
ELECTIVE
BANKING (785)
THEORY

Time: 3 Hours ***Marks: 60***

Unit-1: Introduction **10**

- Definition of Bank - Basic functions of Banker.
- Banking System in India.
  - (i) Commercial Banks.
  - (ii) Private Sector Banks.
  - (iii) Public Sector Banks.
  - (iv) Foreign Banks.
  - (v) Regional Rural Banks.
  - (vi) Co-operative Banks.
- Reserve Bank of India.

Unit-2: Banker and Customer **15**

- Relationship between Banker and Customer.
- Special Types of Customers.
- Retail & Wholesale Banking.
- Deposit Accounts – Savings Accounts, Current Accounts, Fixed Deposit Accounts.
- Opening and operation of Accounts.
- Nomination.
- KYC requirements.

- Pass Book.
- Minors.
- Partnerships & Companies.

Unit-3: Employment of Bank Funds 15

- Liquid Assets-Cash in Hand, Cash with RBI & Cash with other Banks.
- Investment in securities.
- Advances - Secured and Unsecured.
- Loans.
- Term Loans.
- Cash Credit.
- Overdraft.
- Discounting of Bills of Exchange.
- Modes of creating charge on Securities.
- Types of Securities.

Unit-4: Negotiable Instruments 10

- Definition & Characteristics of Cheques.
- Bills of Exchange & Promissory Notes.
- Crossings.
- Endorsements.
- Collection and payment of Cheques.
- Liabilities of Parties.

Unit-5: Communication Skills 10

- Elements of Communication
  - (i) Introduce and greet in a proper way.
  - (ii) Framing of question and sentence.
  - (iii) Dealing with customers while they are shopping for goods.
  - (iv) Identify elements of communication cycle.
- Forms of Communication & Communication Equipment
  - (i) Demonstrate effective use of verbal and non verbal communication skills.
  - (ii) Identify the types of communication.
  - (iii) Operate the communication media and equipment properly.
  - (iv) Select the Strategies for Overcome barriers in communication.
- Elements of Business communication
  - (i) Describe the importance of organizational culture in business communication.
  - (ii) Communicate Effectively with Customers.
  - (iii) Describe the qualities that the team member should possess.
- Preparation of Project Report

(i) Describe Project Work/ Assignment.

(ii) Outline the preparation of project report.

PRACTICAL

Time: 2 Hours ***Marks: 40***

1. Visit the Websites of Five Different Commercial Banks **10**

(a) (Three Public Sector and Two Private Sector Banks) offering Retail Banking Products.

(b) Get details of the various Retail Banking Products offered by them.

2. Prepare a Comprehensive Report for each of these Banks Covering the following **5x4 = 20**

(a) Retail Banking products (one Asset Product and one Liability Product) best suited for people in different stages of life cycle.

(b) Five client categories to be selected:

- A young executive who has just joined the job after studies.
- A young housewife with 1 small child.
- A middle aged middle level Senior Executive in a Private Firm having two school going children and dependant parents.
- A elderly lady staying alone with no dependents, and
- A member of the armed forces in mid 30s.

(c) Based on the data which you give in the above, justify your selections for each of them.

(d) List the documents to be submitted by the customers for applying for each product. You can obtain sample forms from any of the banks as you think appropriate.

(e) Explain the operational details for each of the products.

3. Viva **10**

CLASS–XI
ELECTIVE
INSURANCE (786)
THEORY

Time: 3 Hours ***Marks: 60***

Unit-1: Introduction **20**

- Concept of Insurance.
- Need for Insurance.
- Brief history of Insurance industry in India.

(i) Enactment of Insurance Act, 1938.

(ii) Nationalization of Life Insurance Companies in 1955.

(iii) Nationalization of General insurance Companies in 1972.

(iv) Malhotra Committee Report – Opening up of Insurance sector to Private Companies in 2000.

(v) Setting up of Insurance Regulatory and Development Authority in 1999.

Unit-2: Life Insurance 20

- Present Organizational set-up of Insurance Companies in India – L.I.C. and Private Companies with foreign joint ventures, selling Insurance through Agents and Banks.
- Objectives of Life Insurance – Protection and Investment.
- Different types of Life Insurance Policies – Chief characteristics and similarity.
- Basic Pre-requites for Life Insurance – Insurable Interest and utmost Good Faith.
- Procedure for taking a policy.
  - (i) Selection of the Plan.
  - (ii) Consultation of Premium tables.
  - (iii) Filling up of Proposal Form.
  - (iv) Document regarding proof of age.
  - (v) Important clauses of the Policy – eg. Suicide Clause.
  - (vi) Nomination

Unit-3: Annuities and Unit Linked Policies 10

- Concept of Annuity.
- Objectives of Annuity.
- Procedure followed for obtaining Annuities.
- Meaning of Unit Linked Insurance Policies.
- Procedure for obtaining Unit linked insurance Policies.

Unit-4: Post - Issue Matters 10

- Lapse of the Policy due to Non-Payment of Premium.
- Revival of the Lapsed Policies.
- Surrender of the Policy – Payment of surrender value.
- Assignment of the Policies.
- Settlement of claims – Procedure to be followed.

PRACTICAL

Time: 2 Hours ***Marks: 40***

1. Visit the Websites of five different Insurance Companies Offering Life Insurance. Get details on the Various Policies Offered by them. **10**

2. Prepare a Comprehensive Report for each of these Companies Covering the following: **20**

(a) Insurance products best suited for the different life stages – take five examples like young executive having joined job after studies, young married woman with one small child, middle aged man having two school going children and one dependent parent, Elderly lady staying alone with no dependents, member of the armed forces in mid 30s.

(b) From the chart above, recommend the best suited life insurance policy to each of them.

(c) List the documents to be submitted for applying for each type of insurance and help them fill out the application form. You can obtain sample application forms from the relevant insurance company.

(d) Explain the claims procedure along with requirements for claiming insurance at the time of occurrence of the insured event.

3. Viva **10**

CLASS–XI
GENERAL FOUNDATION COURSE (501)

Time: 3 Hours *Marks: 100*

Part–I: (Compulsory to all Vocational Courses) *Marks: 50*

A. Business Management and Entrepreneurship 30

(a) **Entrepreneurship Orientation** **5**
Importance and relevance in real life: Emphasis on self employment.

(b) **Entrepreneurship Values and Attitudes** **5**
Innovativeness, Independence, Risk Taking, Analytical ability.

(c) **Entrepreneurial Motivation** **5**
Achievement Planning, personal efficacy, entrepreneurial goal setting.

(d) **Launching of a Business Venture** **15**
Identification of project, steps in setting up a business, information about various institutions providing assistance, project formulation.

B. Computational Skills 10

(a) Percentage, ratio & proportion, profit & loss, discount, simple and compound interest, population growth and depreciation of value of articles using logarithm. **6**

(b) Area and volume: rectangle, parallelogram, circle, cube, cone, cylinder & sphere. **4**

C. Environmental Education 5

(a) Environment and the society.

(b) Environment properties risks in different economic enterprises, in use of raw materials, in processing / manufacturing and designing.

(c) Poverty and environment.

D. Rural Development 5

(a) Agriculture, the back bone of Indian Economy.

(b) Rural development projects in India including Integrated rural development programme.

(c) Agro based rural industries.

(d) Community approach to rural development.

Part–II *Marks: 50*

1. Economic Environment or Business 8

Product of pricing, market & market economy, foundation of market system. The role of price mechanism in a market economy. Functions of price mechanism, limitations of market mechanism.

2. Emerging Social Structure 8

Basic principles underlying all economic activity, the unequal growth, the capitalist economy - Its characteristics - its strength & weaknesses - the Indian experience - the International Scene - its Role in Socio/economic scence.

3. Planning & Budgeting 8

Steps in planning - Need for budgeting - Budgets and Forecast, Preparing the Budget - The starting Point, the targets - Administration & review of budgets - follow up process - Benefits and limits of budgeting. A note of zero base budgeting – Planning in India - National Planning affects all.

4. Financial Institutions & Capital Markets — 8

Capital market - Need for capital formation, need for capital formation in India, Unit Trust of India - Financial Institutions - Money Lending & Banking - Different Classification of Banks. Functions of Commercial Banks, Specialised Banks. The Reserve Bank of India, Other financial institutions, The IDBI, IFC, ICICI, LIC, UTI & GIC Mutual Funds.

5. Risk and Risk Management — 5

Chance, Risk, Probability - How to deal with risk, sharing the risk.

6. Office Management — 5

Office - Location, space, type of business, principles of Office layout, Functions of office inward / outward / filling. Methods of filling - indexing - mioxchines & office appliances - computers.

7. Management Concepts — 8

Management functions, Management - Kept to prosperity - planning - its nature - types of plans - steps in planning - The planning period. Objectives - management on objectives - its benefits and limitations. Strategic planning process - sales forecasts - methods-decision making - organising - division - span of management departmentation - strategic business units - line staff authority. Decentralisation of authority. Delegation of authority. Advantages and limitation. Groups in managing - characteristics - functions. Advantages and disadvantages of groups selection - The process its limitations - training or new employees, assessment of performance communication.

CLASS–XII
ELECTIVE
BANKING (785)
THEORY

Time: 3 Hours ***Marks: 60***

1. Ancillary Services of Banks — 10

- Safe custody of valuables.
- Lockers.
- Remittances – RTGS/NEFT/Drafts.
- Fee based services- Issuing Guarantees and letters of credit.
- Selling Third Party Products- Insurance and Mutual fund units.
- Credit Cards, Debit Cards.
- Brokerage and Demit Services.

2. Innovations in Banking Technology — 10

- Bank Computerization.
- Core Banking.
- Online Banking.
- Mobile Banking.

- Internet Banking.
- ATMs.

3. Organization of a Bank Branch **10**

- Bank Branch Set up, Strong Room.
- Front Office, Back Office.
- Security Arrangements in Bank.
- Clearing Houses.

4. Basics of Business Mathematics **10**

- Calculation of simple interest and Compound Interest.
- Calculations of interest on fixed rate and Floating rate.
- Calculation of EMIs.
- Calculations of interest on Savings Accounts.
- Calculations of date of maturity of bills of exchange.

5. Reserve Bank of India Regulations on Banks **10**

- Cash Reserve Ratio.
- Statutory Liquidity Ratio.
- Bank Rate.
- Repo Rate.
- Reverse Repo Rate.
- Base Rate.

6. Performa of Final Accounts of Banking Companies **10**

- Profit & Loss Account and Balance Sheet.

PRACTICAL

Time: 2 Hours ***Marks: 40***

1. Visit any nearest Bank branches which is nearer to your residence.

(a) Collect details of different modes of transferring funds from one person to another. Collect samples documents forms for each of such modes of transfer. **10**

(b) Tabulate the advantages and disadvantages of each mode of the payment system. **10**

2. Download the Balance Sheets of a Public Sector Bank and a Private Sector Bank as on 31st March of the current year from their websites.

(a) Compare the composition of their Deposits - Percentage of demand deposits to the total deposits, and percentage of Time Deposits to the total deposits, cost of deposits in % in both the banks and comment which bank is better managed from profit point of view. **10**

(b) Composition of their loans, total interest earned on loans and comment on the profitability of the banks.

3. Viva **10**

CLASS–XII
ELECTIVE
INSURANCE (786)
THEORY

Time: 3 Hours ***Marks: 60***

Unit-1: General Insurance — 15

- Meaning and importance of General Importance.
- Different types of General Insurance.
  - (i) Fire Insurance.
  - (ii) Marine Insurance.
  - (iii) Motor Vehicle Insurance.
  - (iv) Medi-Claim Insurance.
  - (v) Accident Insurance.
  - (vi) Burglary and Theft Insurance.
  - (vii) Present Organizational set up of General Insurance companies in India - GICI - its subsidiaries, Private Companies.
  - (viii) Principles of General Insurance - Insurable Interest, Indemnity, subrogation, good faith.

Unit-2: Fire Insurance — 10

- Types of Fire insurance Polices - Their main features and clauses.
- Meaning & Significance of Average Clause.
- Procedure for taking Fire Insurance Policies and settlement of claims.

Unit-3: Marine Insurance — 10

- Three types of Marine insurance - Cargo Insurance, Hull Insurance and Freight Insurance.
- Types of Policies.
- Clauses of a Marine Insurance Policy.
- Marine losses.

Unit-4: Motor Vehicle Insurance — 10

- Types of Polices and Risks Covered therein.
- Procedure for obtaining motor Insurance Policy.
- Settlement of claims.

Unit-5: Medi-Claim and Accident Insurance — 5

- Important conditions of such Polices and Benefits available therein, Procedure for claims.

Unit-6: Burglary and Theft Insurance — 10

- Need for such Insurance.
- Information to be furnished and procedure to be follow.
- Recovering the claims.

PRACTICAL

Time: 2 Hours *Marks: 40*

1. **Create detailed profiles of five of your neighbours and friends, in terms of their demographics, risk appetite and insurance requirements.** **10**

2. **Prepare a comprehensive report for each of these individuals covering the following:**

   (a) Insurance products best suited for their requirements and give the rationale for the same.

   (b) Detail the regulatory aspects of each of the recommended types of insurance from an investor protection point of view.

   (c) List the documents to be submitted for applying for each type of insurance and help them fill out the application form. You can obtain sample application forms from the websites of any of the leading general insurance providers in India.

   (d) Explain the procedure along with requirements for claiming insurance at the time of occurrence of the insured event. **20**

3. **Viva** **10**

CLASS–XII
GENERAL FOUNDATION COURSE (501)

Time: 3 Hours *Marks: 100*

Part–I: (Compulsory to all Vocational Courses) *Marks: 50*

A. Business Management and Entrepreneurship **30**

Management of Business

Elementary treatment/exposure to basic conceptual frame work of the topic listed below:

(a)= Basic Function. **6**

(b) Marketing Management. **6**

(c) Financial Management. **6**

(d) Production Management. **6**

(e) Personnel Management. **6**

B. Computational Skills **10**

1. (a) Solution of linear equations and their application to problem of commercial mathematics. **5**

   (b) System of linear equations and in equation in two variables. Applications in formation of simple linear programming problems.

2. Statistics: Raw data, bar charts and Histogram; Frequency Tables; Frequency Polygon; Ogive; Menu, Median and Mode of ungrouped and grouped data; Standard Deviation; Introduction to Mortality tables; Price Index etc. Introduction to Computers. **5**

C. Environmental Education & Rural Development **10**

1. **Environmental Education** **5**

   (a) Modernisation of agriculture and environment, irrigation, water logging, use of fertilisers, pesticides, soil erosion, land degradation (desertification and deforestation), silting and drying of water resources.

   (b) Rational utilisation, conservation and regeneration of environmental resources (soil, air, water, plant, energy, minerals).

2. **Rural Development** **5**

Principles and goals of rural development, major problems/constraints in rural development in India.

Part–II

Marks: 50

1. Sales Administration **7**

Organisation of sales department - selection training, supervision, compensation of the sales force.

2. Publicity & Public Relations **7**

Advertising Programmes - Techniques, media and methods of advertising, coordination with sales organisation.

3. Salesmanship **7**

Art of salesmanship - creation of consumer desire, aiding customers in buying, characteristics of an efficient salesman buying motive and selling techniques.

4. Business Policy **7**

Integration information of accounting finance, marketing, law production, about for meeting top management requirements.

5. Special Aspects and Marketing **7**

Marketing of agricultural produce - regulated markets, international marketing fairs and exhibitions, marketing products of small scale industries.

6. Business and Trade Association **5**

Structure, functions, problems and prospects.

7. Administrative Environment of Business **5**

Business industrial relations, industrial policy.

8. Social Environment of Business **5**

Significance of business ethics - rules of competition, standard for fair service, fair price, fair wage.

LIST OF EQUIPMENTS AND SOFTWARE

1. Calculators.
2. Computers.
3. Printers.
4. Software like MS-Excel etc.
5. Computer Stationery.
6. Smart boards to make the subject more interesting.
7. Demonstration stand.

RETAIL

Introduction

The main objectives of introducing 'Retail' course in CBSE schools are:

1. To enable the students get jobs in organised Retail sector.
2. To facilitate the students to be industry ready and to meet the employability criteria set by different companies.
3. To prepare a skilled workforce at entry level in Retail industry by equipping them with thorough understanding of Customer Service areas and equipment handling.

CLASS–XI
ELECTIVE
RETAIL OPERATIONS (743)
THEORY & PRACTICAL

Time: 3 Hours + 2 Hours ***Marks: 100 (Theory 60 + Practical 40)***

Unit-1: Fundamentals of Retailing

- Introduction, Basics of Retailing, Retail Formats, Functions of Retailers, Trends in Retailing. **10+6**

Unit-2: Retail Marketing Mix

- Introduction, Product Mix, Price Mix, Promotion Mix, Place Mix, Process People and Physical Evidence.

10+8

Unit-3: Merchandising Management

- Introduction, Source of Merchandise, Functions of Merchandising, Handling of Merchandising, Duties and Responsibilities of Merchandiser. **10+7**

Unit-4: Retail Store Layout Design

- Introduction, Types of Retail Location, Store Layout, Design Decision, Functions of Retail Store Associate. **10+7**

Unit-5: Health, Safety and Hygiene in Retailing

- Introduction, Health Care, Personal Grooming, Hazards at Workplace, Safety Measures at Workplace.**10+7**

Supplementary Reading Material

Unit-6: Steps in Retail Planning

- Introduction, Retail Planning Process, Steps in Retail Planning, Types of Retail Plan, Problems in Retail Planning, Problem Solving, Building Retail Sales Capacity, Summary. **5+2**

Unit-7: Retail Branding

- Introduction, Retail Branding, Steps in Branding, Retail Marketing - Tips to Promote a Retail Brand, Significance of Brands, Need of Brand Identity system, Summary. **5+3**

CLASS–XI
ELECTIVE
RETAIL SERVICES (744)
THEORY & PRACTICAL

Time: 3 Hours + 2 Hours ***Marks: 100 (Theory 60 + Practical 40)***

Unit-1: Retail Selling Skills

- Selling Methods, Selling Process Salesmanship (Duties of Sales Personnel), Qualities of Goods Sales Person for Handling Queries. **15+8**

Unit-2: Business Communications

- Elements of Communication, Forms of Communication and Communication Equipment's, Element of Business Communication, Preparation of Project Report. **15+8**

Unit-3: Customer Relationship Management

- CRM Process, Duties and Responsibilities of Customer Services Associate, Customer Retention Strategies, Handling Customer Grievances. **15+9**

Supplementary Material

Unit-4: Introduction to Retail Services

- Introduction, Meaning and Scope of Retail Services, Role of Retail Services, Characteristics of Retail Services, Factor Affecting Retail Services, Recent Trends in Retail Services Summary. **5+5**

Unit-5: Retail Customer Services

- Introduction, Meaning of Customer Service, Classification of Customer Service, Limitation of Customer Service, Summary. **5+5**

Unit-6: Customer Service Associate Profile

- Introduction, Customer Service Associate, Skills Required to be Good CSA, Duties and Responsibilities of CSA, Summary. **5+5**

CLASS–XI
GENERAL FOUNDATION COURSE (501)

(Common for Office Secretaryship, Stenography & Computer Application, Accountancy & Taxation, Marketing & Salesmanship, Retail, Financial Market Management and Business Administration)

(Refer to page 14)

CLASS–XII
ELECTIVE
RETAIL OPERATIONS (743)
THEORY & PRACTICAL

Time: 3 Hours + 2 Hours ***Marks: 100 (Theory 60 + Practical 40)***

Unit-1: Inventory Management in Retailing

- Types in Inventory, Inventory Management, Inventory Management, Inventory Control System, Stock Valuation and Recording. **11+8**

Unit-2: Security & Housekeeping Supervision in Retail Sector

- Functions and Points if Security, Safety and Surveillance Equipment, Handling of Material and Equipments in Housekeeping, Duties and Responsibilities of Supervisor. **11+8**

Unit-3: Supply Chain Management in Retailing

- Introduction to SCM, Principles of SCM, Participants in the Process of SCM, Step in SCM. **11+8**

Unit-4: Billing and Accounting Procedures in Retailing

- Billing Procedure, Fundamentals of Accounting, Journal, Ledger and subsidiary Books, Trading, Profit & Loss Account and Balance Sheet. **11+8**

Supplementary Reading Material

Unit-5: Retail Supply Chain

- Characterizing the types of Retail Supply Chain. **8+4**

Unit-6: Inventory Handling

- Introduction, Understanding the Basics of Inventory Handling, Understanding the Process of Inventory Handling-I, Understanding the Process of Inventory Handling-II. **8+4**

CLASS–XII
ELECTIVE
RETAIL SERVICES (744)
THEORY & PRACTICAL

Time: 3 Hours + 2 Hours ***Marks: 100 (Theory 60 + Practical 40)***

Unit-1: Advances in Retailing

- Retail Organizational Structure, Retail Research, Retail Strategy, Retail Consumer Behaviour. **11+7**

Unit-2: Display of Products and Satisfy Customer Needs

- Display or Products and Satisfy Customer Needs, Sale and Delivery of Products, Maintenance of Store Areas and Communicate Effectively with Stakeholders, Duties & Responsibilities of State Supervisor. **12+8**

Unit-3: Non-store Retailing

- E-Retailing Logistics, E-Marketing, Telemarketing, Internet Business. **10+8**

Unit-4: Event Management in Retailing

- Understanding Event Management, Documentation for Conducting Events, Logistics and Standard Operating Procedures (SOP), Supervising Events. **12+8**

Supplementary Material

Unit-5: Visual Merchandise

- Visual Merchandise - Ideas, Understanding Store Fixtures. **5+3**

Unit-6: Retail Pont-of-Sale: An Overview

- Understanding Components of Point-of-Sales, Understanding the Process of Point-of-Sale, Learning Point-of-Sale Marketing. **5+3**

Unit-7: Retail Information Systems (RIS)

- Knowing the Retail Information System, Understanding IT Application in Retail: Data mining & Warehousing. **5+3**

CLASS–XII

GENERAL FOUNDATION COURSE (501)

(Common for Office Secretaryship, Stenography & Computer Application, Accountancy & Taxation, Marketing & Salesmanship, Retail, Financial Market Management and Business Administration)

(Refer to page 24)

LIST OF RECOMMENDED BOOKS

1. Dynamics of Retailing, Students Handbook, Class X, Published by CBSE.
2. Retail Operations–I, Students Handbook, Class XI, Published by CBSE.
3. Retail Operations–II, Students Handbook, Class XII, Published by CBSE.
4. Retail in Detail by McGraw-Hill.
5. Start Your Own Successful Retail Business by McGraw-Hill.
6. Retail Success by Willoughby.
7. Retail Management: A Strategic Approach by Prentice Hall.
8. Retail Management by McGraw-Hill.

SUGGESTED LIST OF EQUIPMENTS

1. Shelves for Stacking Products.
2. Shopping Cart.
3. Signage Board.
4. Offer Signages.
5. End Cap Table (POS), Chair (POS), Poster (POS).
6. Card Swiping Machine.
7. Mannequins.

8. Gondolas.
9. Display Photographs.
10. Products.
11. Danglers.
12. Coupons and Vouchers.
13. Credit Notes.
14. Currency notes of different Denominations.
15. Carry Bags.
16. Neck, Locks for Carry Bags.
17. Physical Bill Copy.
18. Photography of Stacked Notes.

FINANCIAL MARKET MANAGEMENT

Introduction

Mr. Y. Reddy, the Governor of Reserve Bank of India while inaugurating an International Conference on Financial Education has stated "Present day school pass outs need to be lot more financially literate than their parents were. Financial Education can make a difference not only in the quality of life that individuals can afford but also the integrity and quality of markets. In U. K. and U. S. A. the Financial Education starts from Class VI onwards. The CBSE is taking a revolutionary step by introducing Professional Competency Education or Occupation Oriented Education in Financial Markets for the first time in India at 10+2 level.

India is one of the best emerging markets in the world with 2 crores investors. The Bombay Stock Exchange's (BSE) Sensex and National Stock Exchange (NSE) appreciated by 73.7 percent and 67.1 percent respectively over March 31, 2005. The Market capitalization of NSE and BSE are Rs. 2,777,401 crores and Rs. 2,993,779 crores respectively. The market capitalization to GDP ratio was 85.6% as on 31 March 2006.

Public at large has shown tremendous faith in the mutual funds. In 2005-06. The mutual funds industry mobilized highest ever amount of Rs. 52,779 crores. The total money under the mutual funds management is Rs. 307,107 crores. The Number of brokers and sub brokers registered with SEBI are 9335.

A large number of Foreign Institutional Investors (FIIs) are investing heavily in India and the investment amount was Rs. 48,801 crores in 2006. The total number of FIIs registered with Securities Exchange Board of India (SEBI) are 882.

There is huge employment potential in Financial Market. As per industry estimates there is shortage of more than 50,000 professionals in stock and commodity markets. This shortage is projected as one lakh by 2008-09.

The BPO (Business Process Outsourcing) Industry is slated to touch revenues of Rs. 155604 crores by the end of 2006 as per NASSCOM. The total direct employment in the Indian IT-ITES sector is estimated to have grown by over a million, from 284,000 in FY 1999-2000 to a projected 1,287,000 in the current fiscal (2005-06). In addition to nearly 1.3 million – strong workforce employed directly in the industry, Indian IT-ITES is estimated to have helped create an additional 3 million job opportunities through indirect and induced employment. Therefore, in ITES (BPO) alone there is acute shortage of trained manpower, coupled with high degree of attrition.

Computerized accounting and finance in organized and unorganized sectors is another area of employment for the youth.

Hon'ble Prime Minister of India Dr. Manmohan Singh announced on the Independence day that the Scheme of Vocational Education and Training will be implemented in a mission mode to provide employment to a large number of youth in the county. India being young nation, around 28 million youth are added every years looking for employment. To fulfill the training needs of the huge target groups, emerging employment opportunities in various sectors of economy need to be explored.

At this juncture, it is more appropriate for developing course on Financial Market Management under professional Competency Education where much emphasis is given for Competency Based Curriculum, Competency Based Training and Competency Based Assessment and Competency Based industry joint certification with NSE. The curriculum would be revised periodically as per the changes of the market demand.

The CBSE has appointed a Curriculum Development Committee under the chairmanship of Shri. G. C. Sharma, Director, BLB Institute of Financial Markets (An Education arm of BLB Group) as a representative of ASSOCHAM.

PSS Central Institute of Vocational Education, NCERT has provided all necessary support for development of curriculum and other teaching learning material for the course.

It is hoped that the present curriculum would help a large number of youth to acquire employable skills and to enter world of work for their decent livelihoods and for economic growth of the country.

EMPLOYMENT OPPORTUNITIES

Trading

- Dealer, Cash and Futures Market.
- Arbitrageurs, Cash and Futures Market.

Marketing

- Executive, Client Acquisition.
- Executive, Client Conversion and Retention.
- Sales Executive.
- Management Trainees.
- Customer Care, E-broking.
- Telemarketers/Telecallers.
- Executive, Market Research.

Back-Office

- Accounting and Finance Executive.
- Executive, Depository Participant.
- Executive, Payment Collection.
- Executive Investor's grievance.

IT

- Executive, Finance Technology.
- Executive, Web Developer.

Finance and Audit Companies

- Account Manager.
- Commercial Assistant.
- Junior Accounts Executive.

- Finance Coordinator.
- Taxation Assistant.
- Accounts & Finance Executive.
- Assistant in Trust companies and other financial institutions.
- Computer Operator in Financial and other companies.

CLASS–XI
ELECTIVE
FOUNDATIONS OF FINANCIAL MARKETS (793)
THEORY

Time: 3 Hours ***Marks: 60***

Chapter-1: Investment Basics — 10

Investment.

Reasons to Invest.

Time to Invest.

Precautions to be take while investing.

Meaning of Interest.

Factors that determine interest rates.

Options available for investment.

Short-term financial options available for investment.

Long-term financial options available for investment.

Stock Exchange.

Equity/Share.

Debt Instrument.

Derivative.

Mutual Fund.

Index.

Depository.

Dematerialization.

Chapter-2: Securities — 6

Securities.

Function of Securities Market.

Types of Securities.

2.1 Regulator.

Need for Regulators.

Types of Regulators.

SEBI and its role.

2.2 Participants.

Participants in the Securities Market.

Necessity to transact through an intermediary.

Segments of Securities Market.

Chapter-3: Primary Market 6

Role of the 'Primary Market'.

Face Value of a share/debenture.

Premium and Discount in a Security Market.

3.1 Issue of Shares.

Public Issue.

Different kinds of issues.

Issue price.

Market Capitalisation.

Difference between public issue and private placement.

Initial Public Offer (IPO).

Pricing of an issue.

Price discovery through Book Building Process.

Difference between offer to shares through book building and offer of shares through normal public issue.

Cut-off Price.

Floor price in case of book building.

Price Band in a book built IPO.

Deciding the Price Band.

Minimum number of days for which a bid should remain open during book building.

System to be used for book building.

Allotment to be used for book building.

Allotment of shares.

Time frame to get the shares listed after issue.

Role of a 'Register' to an issue.

Role of NSE to facilitate IPO.

Prospectus.

Draft Offer document.

Abridged Prospectus.

Role of Merchant Bankers.

Lock-in.

Listing of Securities.

Listing Agreement.

Delisting of securities.

Procedure for filling an Issue by the company.

Role of SEBI in an issue.

Investor duty.

3.2 Foreign Capital Issuance.

Foreign currency resources.

American Depository Receipt.

Global Depository Receipts.

Chapter-4: Secondary Market 5

4.1 Introduction.

Secondary market.

Role of the Secondary Market.

Difference between the Primary Market and the Secondary Market.

4.1.1 Stock Exchange

Role of a Stock Exchange in buying and selling shares.

Demutalisation of stock exchanges.

Difference between demutualised exchange different from a mutual exchange.

4.1.2 Stock Trading

Screen Based Trading.

NEAT.

Placing orders with the broker.

Access to internet based trading facility Contract Note.

Details are required on the contract note issued by the stock broker.

Maximum brokerage that a broker can charge.

Reasons to trade on a recognized stock exchange.

Registration of broker or sub broker.

Precautions to be taken before investing in the stock markets.

Do's and Don'ts while investing in the stock markets.

4.2 Products in the Secondary Markets.

Types of products dealt in the Secondary Markets.

4.2.1 Equity Investment

Reasons to invest in equities.

Average return on Equities in India.

Factors that influence the price of a stock.

Meaning of the terms Growth Stock / Value Stock.

Process to acquire equity shares.

Bid and Ask Price.

Portfolio.

Diversification.

Advantages of having a diversified portfolio.

4.2.2 Debt Investment

Debt Instrument.

Features of debt instruments.

Interest payable by a debenture or a bond.

Segments of the Debt Market in India.

Participant in the Debt Market.

Credit rating of bonds.

Acquire securities in the debt market.

Chapter-5: Derivatives **5**

Types of derivatives.

Option premium.

Commodity exchange.

Meaning of commodity.

Commodity derivatives market.

Difference between commodity and financial derivatives.

Chapter-6: Depository **5**

Role of depository similar to a bank.

Types of depositories in India.

Benefits of participation in a depository.

Depository participant (DP).

Minimum balance requirement with DP.

ISIN.

Custodian.

Dematerialisation.

Dematerialisation of odd lot shares.

Features of dematerialised shares.

Rematerialisation.

Dematerialisation of debt instruments, mutual fund units and government securities.

Chapter-7: Mutual Funds **5**

Regulatory body for Mutual Funds.

Benefits of investing in Mutual Funds.

NAV.

Risks involved in investing in Mutual Funds.

Different types of Mutual Funds.

Different investment plans that Mutual Funds offer.

The rights that are avlaible to a Mutual Funds holder in India.

Fund Offer document.

Active fund management.

Passive Fund Management.

ETF.

Chapter-8: Miscellaneous 4

8.1 Corporate Actions.

Corporate Actions.

Dividend.

Divided yield.

Stock Split.

Reasons for Stock Split.

Buyback of Shares.

8.2 Index.

The Nifty Index.

8.3 Clearing & Settlement and Redressal.

Clearing Corporation.

Rolling Settlement.

Pay-in and Pay-out.

Auction.

Book-closure/Record date.

No-delivery period.

Ex-dividend date.

Ex-date.

Resources available to investor/client for redressing his grievances.

Arbitration.

Investor Protection Fund.

Chapter-9: Concepts & Modes of Analysis 10

Simple Interest.

Compound Interest.

Time Value of Money.

Computation of Time Value of Money.

Effective Annual Return.

Systematically analyzing a company.

Annual Report.

Features of an Annual Report.

Difference between Balance Sheet and Profit and Loss Account Statements Sources of Funds.

Difference between Equity shareholders and Preferential shareholders.

Difference between secured and unsecured loans under Loan Funds.

Application of Funds.

Meaning of 'Gross block', 'Depreciation', Net Block' and 'Capital-Work in Progress' Current Liabiilties and Provisions and Net Current Assets in the balance sheet.

Summarizing balance sheet.

Components of Profit and Loss Account statement.

Check points for a Profit and Loss Account.

Chapter-10: Ratio Analysis **4**

CLASS–XI
ELECTIVE
MUTUAL FUNDS (794)
THEORY

Time: 3 Hours

Part – A

Chapter-1: Mutual Funds **5**

1.1 Introduction.

1.2 Mutual Funds: Structure in India.

1.3 Who manages Investor's Money.

1.4 Who is a custodian.

1.5 What is the role of the AMC.

1.6 What is an NFO.

1.7 What is the role of a Registrar and Transfer Agents.

1.8 What is the procedure for investing in an NFO.

1.9 What are the investor's rights and obligations.

Chapter-2: Mutual Funds Products and Features – Equity Funds **5**

2.1 What are open ended and close ended Funds.

2.2 What are Equity Funds.

2.3 What is an Index Funds.

2.4 What are diversified Large Cap Funds.

2.5 What are Midcap Funds.

2.6 What are Sectoral Funds.

2.7 Other Equity Schemes.

2.8 What is an Entry Load.

2.9 What is Expense Ratio.

2.10 What is Portfolio Turnover.

2.11 How does AUM affect Portfolio Turnover.

2.12 How to analyse cash level in Portfolios.

2.13 What are Exit Loads.

Chapter-3: Gold ETFs **4**

3.1 Introduction to Exchange Traded Funds.

3.2 Salient Features.

3.3 Working.

3.4 Market Making by APs.

3.5 Creation Units, Portfolio Deposit and cash component (An example).

Chapter-4: Debt Funds **3**

4.1 Salient Features.

4.2 What is interest rate risk.

4.3 What is credit risk.

4.4 How is a Debt instrument priced.

Chapter-5: Liquid Funds **3**

5.1 Salient Features.

5.2 Floating Rate Scheme.

5.3 What is portfolio churning in liquid funds.

Chapter-6: Taxation **2**

6.1 Capital Gains Taxation.

6.2 Indexation Benefit.

6.3 Why FMPs are popular.

Chapter-7: Regulations **4**

7.1 Overview.

7.2 What is the name of industry association for the mutual fund industry.

7.3 What are the objectives of AMFI.

7.4 Advantages of Mutual Funds.

7.5 What is a Systematic Investment Plan (SIP).

7.6 What is a Systematic Transfer Plan (STP).

7.7 What is Systematic Withdrawal Plan (SWP).

7.8 Choosing between dividend payout, dividend re-investment and growth options – which one is better for the investor.

Part – B

Chapter-1: Mutual Funds in Perspective **3**

1.1 Mutual Funds.

1.2 Portfolio Management Schemes (PMS).

1.3 Hedge Funds.
1.4 Venture Capital Funds & Private Equity Funds.

Chapter-2: Investments by Mutual Fund Schemes Equity **4**

2.1 Equity.
2.2 Debt.
2.3 Derivatives.
2.4 Gold.
2.5 Real Estate.
2.6 International Investments.

Chapter-3: Valuation of Investments by Mutual Fund Schemes Equity **3**

3.1 Equity.
3.2 Debt.
3.3 Gold.
3.4 Real Estate.

Chapter-4: Mutual Fund Accounting **3**

4.1 Accounting for Income, Gains & Losses from Investments.
4.2 Accounting for Expenses.
4.3 Determining the NAV.
4.4 Accounting for Load.
4.5 Distributable Reserves.

Chapter-5: Novel Portfolio Structures in Mutual Fund Schemes **4**

5.1 Index Funds.
5.2 Exchange Traded Funds (ETFs).
5.3 Arbitrage Funds.
5.4 Monthly Income Plans (MIP).
5.5 Fix Maturity Plans (FMP).
5.6 Capital Protection Oriented Schemes.

Chapter-6: Quantitative Evaluation of Mutual Fund Schemes **3**

6.1 Returns.
6.2 Risk.
6.3 Risk Adjusted Returns.

Chapter-7: Cut-off Time Regularations & Time Stamping **3**

7.1 Cut off Timing.
7.2 Official Points of Acceptance (POA).
7.3 Time Stamping Requirements.

Chapter-8: Investment in Mutual Funds through NSE **2**

8.1 Listed Schemes.

8.2 Exchange trade Funds (ETFs).

8.3 Mutual Find Service System (MFSS).

Chapter-9: Non-Residential Investment in Indian MF Schemes **2**

9.1 Investment by NRIs/PIOs.

9.2 Investment by Foreign Institutional Investors.

9.3 Investment by Qualified Foreign Investors.

Chapter-10: Investment by Indians in International MF Schemes **3**

10.1 Foreign Direct Investment and Portfolio Investment.

10.2 Investing in International Mutual Fund Schemes.

10.3 Why invest abroad.

10.4 International Fund of Funds.

Chapter-11: Mutual Fund Taxation **2**

11.1 Mutual Fund Tax Provisions.

11.2 Compounding Wealth, Gross of Tax.

11.3 Dividend Payout and Growth Options within Schemes.

11.4 Double Indexation.

11.5 Setting of & Carry Forward of Losses.

11.6 Dividend Stripping.

Chapter-12: SID, SAI, KIM & Fact Sheets **2**

12.1 Scheme Information Document (SID).

12.2 Statement of Additional Information (SAI).

12.3 Key Information Memorandum (KIM).

12.4 Fund Account Statements / Consolidated Statement of Accounts.

12.5 Fact Sheets.

CLASS–XI
OPTIONAL
FINANCIAL ACCOUNTING (780)

(Common for Accounting & Taxation and Financial Market Management)

(Refer to page 41)

CLASS–XI
GENERAL FOUNDATION COURSE (501)

(Common for Office Secretaryship, Stenography & Computer Application, Accountancy & Taxation, Marketing & Salesmanship, Retail, Financial Market Management and Business Administration)

(Refer to page 14)

CLASS–XII
ELECTIVE
CAPITAL MARKET OPERATIONS (793)
THEORY

Time: 3 Hours ***Mar***

Chapter-1: An Overview of the Indian Securities Market 10

1.1 Market Segments.
1.2 Key Indicators Of Securities Market.
1.3 Products and Participants.
1.4 Market Segments and their Products.
1.5 Reforms in Indian Securities Markets.

Chapter-2: Trading Membership 15

2.1 Stock Brokers.
2.2 NSE Membership.
2.3 Surrender of Trading Membership.
2.4 Suspension & Expulsion of Membership.
2.5 Declaration of Defaulter.
2.6 Authorised Persons.
2.7 Sub-Brokers.
2.8 Broker-Clients Relations.
2.9 Sub-Broker-Clients Relations.
2.10 Investor Service Cell And Arbitration.
2.11 Code of Advertisement.

Chapter-3: Trading 15

3.1 Introduction.
3.2 Neat System.
3.3 Market Types.
3.4 Trading System Users Hierarchy.
3.5 Local Database.
3.6 Market Phases.
3.7 Logging On.
3.8 Log Off/Exit from the Application.
3.9 NEAT Screen.
3.10 Invoking an inquiry Screen.
3.11 Order Management.
3.12 Trade Management.
3.13 Auction.

3.14 Limited Physical Market.

3.15 Block Trading Session.

3.16 Retail Debt Market (RDM).

3.17 Trading Information downloaded to Members.

3.18 Internet Broking.

3.19 Co-location.

3.20 Wireless Application Protocol (WAP).

Chapter-4: Clearing, Settlement and Risk Management **10**

4.1 Introduction.

4.2 Key Terminologies used in Clearing and Settlement Process.

4.3 Transaction Cycle.

4.4 Settlement Agencies.

4.5 Clearing and Settlement Process.

4.6 Securities and Funds Settlement.

4.7 Shortages Handling.

4.8 Risks in Settlement.

4.9 Risk Management.

4.10 International Securities Identification Number.

4.11 Data and Report Downloads.

Chapter-5: Legal Framework **7**

5.1 SEBI (Intermediaries) Regulations, 2008.

5.2 SEBI (Prohibition of Insider Trading) Regulations, 1992.

5.3 SEBI (Prohibition of Fraudulent And Unfair Trade Practices Relating to Securities Market)

5.4 Regulations, 2003.

5.5 The Depositories Act, 1996.

5.6 Indian Contract Act, 1872.

5.7 Income Tax Act, 1961.

Chapter-6: Fundamental Valuation Concepts **3**

6.1 Time value of Money.

6.2 Understanding Financial Statements.

CLASS–XII
ELECTIVE
DERIVATIVE MARKET OPERATIONS (794)
THEORY

Time: 3 Hours ***Mar***

Chapter-1: Introduction to Derivatives **5**

1.1 Types of Derivative Contracts.
1.2 History of Financial Derivatives Markets.
1.3 Participants in a Derivative Market.
1.4 Economic Function of the Derivative Market.

Chapter-2: Understanding Interest Rates and Stock Indices **5**

2.1 Understanding Interest rates.
2.2 Understanding the Stock Index.
2.3 Economic Significance of Index Movements.
2.4 Index Construction Issues.
2.5 Desirable Attributes of an Index.
2.6 Applications of Index.

Chapter-3: Futures Contracts, Mechanism and Pricing **5**

3.1 Forward Contracts.
3.2 Limitations of Forward markets.
3.3 Introduction to Futures.
3.4 Distinction between Futures and Forwards Contracts.
3.5 Futures Terminology.
3.6 Trading Underlying vs. Trading Single Stock Futures.
3.7 Futures Payoffs.
3.8 Pricing Futures.
3.9 Pricing Stock Futures.

Chapter-4: Application of Future Contracts **5**

4.1 Understanding Beta (β),
4.2 Numerical illustration of Applications of Stock Futures,
4.3 Hedging using Stock Index Futures,

Chapter-5: Options Contracts, Mechanism and Applications **5**

5.1 Option Terminology.
5.2 Comparison between Futures and Options.
5.3 Options Payoffs.
5.4 Application of Options.

Chapter-6: Pricing of Options Contracts and Greek Letters **5**

6.1 Variables affecting Option Pricing.
6.2 The Black Scholes Merton Model for Option Pricing (BSO).
6.3 The Greeks.

Chapter-7: Trading Of Derivatives Contracts **10**

7.1 Futures and Options Trading System.
7.2 The Trader Workstation.

7.3 Futures and Options Market Instruments.

7.4 Criteria for Stocks and Index Eligibility for Trading.

7.5 Charges.

Chapter-8: Clearing and Settlement **10**

8.1 Clearing Entities.

8.2 Clearing Mechanism.

8.3 Settlement Procedure.

8.4 Risk Management.

8.5 Margining System.

Chapter-9: Regulatory Framework **5**

9.1 Securities Contracts (Regulation) Act, 1956.

9.2 Securities and Exchange Board of India Act, 1992.

9.3 Regulation for Derivatives Trading.

9.4 Adjustments for Corporate Actions.

Chapter-10: Accounting for Derivatives **5**

10.1 Accounting for futures.

10.2 Accounting for options.

10.3 Taxation of Derivative Transaction in Securities.

PRACTICAL

Time: 2 Hours ***Marks: 40***

To develop the practical skills of students they will also practice on various modules of NSE to Learn to Trade Software as per details given below.

S. No.	Name of NSE - NLT Module	Class
1.	Numeric Speed Accelerator (NSA).	XI
2.	Function Key Accelerator (FKA).	XI
3.	Trading Skill Accelerator (TSA).	XI
4.	Now Simulation Mutual Fund Service System (NSM).	XI
5.	Arithmetic Skill Accelerator (ASA).	XII
6.	Now Simulation Equity Shares (NSS).	XII
7.	Now Simulation Equity Derivatives (NSD).	XII

CLASS–XII
OPTIONAL
FINANCIAL ACCOUNTING (780)

(Common for Accounting & Taxation and Financial Market Management)

(Refer to page 47)

CLASS–XII

GENERAL FOUNDATION COURSE (501)

(Common for Office Secretaryship, Stenography & Computer Application, Accountancy & Taxation, Marketing & Salesmanship, Retail, Financial Market Management and Business Administration)

(Refer to page 24)

LIST OF RECOMMENDED BOOKS

1. Foundations of Financial Markets, Students Handbook, Class XI, Published by CBSE.
2. Mutual Funds, Students Handbook, Class XI, Published by CBSE.
3. Capital Market Operations, Students Handbook, Class XII, Published by CBSE.
4. Derivative Market Operations, Students Handbook, Class XII, Published by CBSE.

LIST OF EQUIPMENTS AND SOFTWARE

1. Computers.
2. Printer.
3. Software.
4. Manual for Various Software / Assorted Reference Books.
5. Demonstration Stand.
6. Computer Consumable Stationery.
7. LCD Projector.
8. NSE – NLT Module.

LIBRARY AND INFORMATION SCIENCES

Introduction

This course aims at training basic theories and principles of administration for effective management of public, academic, special libraries and information centers. Practical and theoretical understanding of and basic competencies required in evaluating, selecting and organizing information sources will be taught. Learning of the professional attitudes and the interpersonal and interdisciplinary skills needed to communicate and collaborate with the colleagues and the information users and to understand the above goals within the perspective of prevailing and emerging technologies.

CLASS–XI
ELECTIVE
LIBRARY, INFORMATION & SOCIETY (747)
THEORY

Time: 3 Hours ***Marks: 60***

- Library, Information & Society - its objectives, functions and the role of library in the development of modern society. **8**
- Types of libraries - Public, academic, special and national library - their objectives, role and functions, Categories of libraries - Traditional, digital, virtual and hybrid library. **12**
- Laws of library science and their implications. **5**
- Information communication and barriers - data, information & knowledge, characteristics, nature and value of information, communication - channels and barriers. **10**
- Traditional sources of information - documentary and non-documentary Sources of information. **10**
- Trends and future of library and information services. **5**
- Career and growth in the field of library science/Scope of library and information science and avenues of higher studies, professional associations and organizations. **10**

PRACTICAL

Time: 2 Hours ***Marks: 40***

- Study Tour to the various types of libraries and documentation centers and prepares their reports. **10**
- Make practical file of structural charts, logos, slogans and quotations, etc. **8**
- Essay/Debates on library activities. **6**
- Visit to book fairs, exhibitions and publishing industries. **10**
- Preparing practical diary on emerging trends in library services. **6**

CLASS–XI
ELECTIVE
LIBRARY CLASSIFICATION & CATALOGUING (748)
THEORY

Time: 3 Hours ***Marks: 60***

- Library Cataloguing – Introduction, need and purpose. **10**

- Cataloguing Methods and Formats (AACR-II), MARC 21. **10**
- Indexing & Subject Heading, Types of subject headings – Library of Congress Subject Headings, Sears List. **10**
- Library Classification – Introduction and Purpose. **10**
- Library Classification – DDC, Concept of main classes, PMEST. **10**
- Technical Processing – Physical processing, records maintenance, call number and its components - class number, book number, collection number. **10**

PRACTICAL

Time: 2 Hours ***Marks: 40***

- Identification of entry elements in the name of personal and corporate author (AACR-II) and Creating catalogue entries using AACR – II by assigning subject headings. **10**
- Creating data sheet using MARC 21. **8**
- Determination of specific subject the headings and creation of Index. **6**
- Classification of documents using DDC. **10**
- Preparing diary for catalogues and classification. **6**

CLASS–XI
GENERAL FOUNDATION COURSE (501)

Time: 3 Hours ***Marks: 100***

Part–I: (Compulsory to all Vocational Courses) *Marks: 50*

A. Business Management and Entrepreneurship **30**

(a) **Entrepreneurship Orientation** **5**
Importance and relevance in real life: Emphasis on self employment.

(b) **Entrepreneurship Values and Attitudes** **5**
Innovativeness, Independence, Risk Taking, Analytical ability.

(c) **Entrepreneurial Motivation** **5**
Achievement Planning, personal efficacy, entrepreneurial goal setting.

(d) **Launching of a Business Venture** **15**
Identification of project, steps in setting up a business, information about various institutions providing assistance, project formulation.

B. Computational Skills **10**

(a) Percentage, ratio & proportion, profit & loss, discount, simple and compound interest, population growth and depreciation of value of articles using logarithm. **6**

(b) Area and volume: rectangle, parallelogram, circle, cube, cone, cylinder & sphere. **4**

C. Environmental Education **5**

(a) Environment and the society.

(b) Environment properties risks in different economic enterprises, in use of raw materials, in processing / manufacturing and designing.

(c) Poverty and environment.

D. Rural Development **5**

(a) Agriculture, the back bone of Indian Economy.

(b) Rural development projects in India including Integrated rural development programme.

(c) Agro based rural industries.

(d) Community approach to rural development.

Part–II *Marks: 50*

1.	Concept of Library.	**8**
2.	Laws of Library Science.	**8**
3.	Library Movement in India.	**8**
4.	Library Association: ILA, IASLILC.	**8**
5.	Educational and Social Functions of Library.	**8**
6.	Reading Habit.	**5**
7.	Library Use.	**5**

CLASS–XII
ELECTIVE
LIBRARY SYSTEMS AND RESOURCE MANAGEMENT (747)
THEORY

Time: 3 Hours *Marks: 60*

- Library Governance, Security, Finance & Budget. **10**
- Infrastructure of Library - Physical Infrastructure, Library space, Computing Infrastructure. **10**
- Acquisition - Policies, Type of materials – books, non - book, non-print, digital selection criteria, methods of acquisition (traditional, online), accessioning, records maintenance. **10**
- Serials Management - Policies, selection criteria, methods of subscription and procurement, e-journals, binding of periodicals, access to back volumes of e-journals, records maintenance. **10**
- Circulation-policies, issue/return systems, reservation. **10**
- Storage and Maintenance - Binding, Preservation – Electronic preservation, Inventory control, Stock Verification, and Weeding out. **10**

PRACTICAL

Time: 2 Hours *Marks: 40*

- Online Procurement of books and periodicals. **10**
- Book Accessioning. **10**
- Registering the periodical issues and sending reminders for missing issues. **10**
- Do's and Don'ts for Preservation of Library Materials. **5**
- Preparing practical diary. **5**

CLASS–XII
ELECTIVE
INFORMATION STORAGE AND RETRIEVAL (748)

THEORY

Time: 3 Hours *Marks: 60*

Unit-1: Library Automation: Planning and Implementing **10**

- Understanding Library Automation.
- Library Automation Planning.
- Implementing Library Automation.

Unit-2: Library Automation Software **10**

- Understanding Concepts of Software.
- Library Automation Software.
- Function of LAS.
- Types/Kinds of Library Automation Software Packages.
- KOHA: A Library Automation Software.

Unit-3: Introduction to Networking **10**

- Understanding Networking.
- Types of Networking and Utility.
- Understanding Server.
- Networking and Communication Protocols.
- Networking Topology.

Unit-4: E-Resources **10**

- Introduction.
- Categories of E-resources.
- Advantages of E-resources.
- Disadvantage of E-resources.

Unit-5: Information Retrieval System **10**

- Information Retrieval System: Concept.
- Search Strategy: The Action Plan.
- Search Query Formulation Process for Information Retrieval in Internet.
- Search Technique and Methods Used.

Unit-6: Web Tools used for Promoting Library Services **10**

- Web Tools: The Concept.
- Web 2.0/(Library 2.0): Concept and Characteristic.
- Web Tools and their Applications.
- Information Access Devices.

PRACTICAL

Time: 2 Hours *Marks: 40*

- Prepare a project of library automation specially planning and implementation using KOHA. **12**

- Hands on practice on blogging, social networking, etc. **8**
- Preparing specifications for Ipad, Ipod, Book Kindle, using Internet and other resources. **6**
- Collection of information on specific topic using various search engines. **8**
- Preparing practical diary on E-resources. **6**

CLASS–XII
GENERAL FOUNDATION COURSE (501)

Time: 3 Hours ***Marks: 100***

Part–I: (Compulsory to all Vocational Courses) *Marks: 50*

A. Business Management and Entrepreneurship **30**

Management of Business

Elementary treatment/exposure to basic conceptual frame work of the topic listed below:

(a)= Basic Function. **6**

(b) Marketing Management. **6**

(c) Financial Management. **6**

(d) Production Management. **6**

(e) Personnel Management. **6**

B. Computational Skills **10**

1. (a) Solution of linear equations and their application to problem of commercial mathematics. **5**

   (b) System of linear equations and in equation in two variables. Applications in formation of simple linear programming problems.

2. Statistics: Raw data, bar charts and Histogram; Frequency Tables; Frequency Polygon; Ogive; Menu, Median and Mode of ungrouped and grouped data; Standard Deviation; Introduction to Mortality tables; Price Index etc. Introduction to Computers. **5**

C. Environmental Education & Rural Development **10**

1. **Environmental Education** **5**

   (a) Modernisation of agriculture and environment, irrigation, water logging, use of fertilisers, pesticides, soil erosion, land degradation (desertification and deforestation), silting and drying of water resources.

   (b) Rational utilisation, conservation and regeneration of environmental resources (soil, air, water, plant, energy, minerals).

2. **Rural Development** **5**

   Principles and goals of rural development, major problems/constraints in rural development in India.

Part–II *Marks: 50*

1. Types of Libraries. **8**
2. Organisational set-up of libraries. **8**
3. Library Extension Activities. **8**
4. Book Clubs. **5**
5. Library Cooperation, library network. **8**

6. Library professional ethics. **8**

7. Qualities and qualification of librarian. **5**

LIST OF RECOMMENDED BOOKS

1. Library, Information and Society, Students Handbook, Class–XI, Published by CBSE.
2. Library Classification and Cataloguing, Students Handbook, Class–XI, Published by CBSE.
3. Library and Information Science, D.K. Pandey.
4. A Comprehensive Course in Library and Information Science: T. Nasirudheen, S.S.
5. A Guide to Library and Information Science Jobs: Mahendra Kumar Seth and Abhijeet.
6. A Handbook of Special Libraries and Librarianship: Anil Kumar Dhiman.
7. A Manual of Library Automation and Networking: N.R. Satyanarayana.

SUGGESTED RESOURCES/EQUIPMENTS

1. A Library should be there as, library will act as lab also.
2. Resources for classification
   (a) DDC book.
   (b) SLSH book.
   (c) Dictionaries, of five different publishing houses.
   (d) Encyclopaedia of five different types.
   (e) Year Book.
   (f) Sample of catalogue cards.
   (g) Accession register.
   (h) Recommendation slips and other stationeries used in library.
3. Computer Lab (normal) with software – Koha, an open source library management software works on linux environment.
4. Internet connection for browsing and searching.

BUSINESS ADMINISTRATION

CLASS–XI
ELECTIVE
BUSINESS OPERATION & ADMINISTRATION (766)
THEORY

Time: 3 Hours ***Marks: 60***

Content	Topics	Marks
1. Introduction to Business Operations	1.1 Concept and definition of Business Operations. 1.2 Types of Business Operations. 1.3 Management of Business Operations.	**5**
2. Business Environment	2.1 Understanding Business Environment. 2.2 Internal and External Factors of Business Environment.	**5**
3. Products and Services	3.1 Concept, Definition and Features of Product. 3.2 Classification of Products. 3.3 Concept, Definition and Features of Services. 3.4 Difference between Product and Service. 3.5 Meaning of Consumer, Identifying Consumer Needs, Classification of Consumers.	**8**
4. Types of Organisation	4.1 Meaning and Definition of Organisation. 4.2 Characteristics and Significance of Organisation. 4.3 Types of Organisation.	**5**
5. Formation of Partnership Firm and Joint Stock Company	5.1 Introduction to Partnership Firm. 5.2 Steps in Formation of a Partnership Firm. 5.3 Meaning, Definition and Characteristics of Joint Stock Company. 5.4 Types of Companies. 5.5 Formation of a Joint Stock Company.	**10**
6. Business Correspondence	6.1 Meaning and Significance of Business Correspondence. 6.2 Rules of Good Business Communication. 6.3 Principles of Business Correspondence. 6.4 Forms and Types of Common Business Letters.	**7**
7. Functional Areas of Management	7.1 Production Management. 7.2 Financial Management. 7.3 Marketing Management. 7.4 Human Resource Management. 7.5 Information Technology.	**10**
8. Organisational Behaviour	8.1 Meaning, Definition and Importance of Organisational Behaviour. 8.2 Characteristics of Organisational Behaviour.	**10**

	8.3 Groups, formation of groups and group dynamics.	

PRACTICAL

Time: 2 Hours ***Marks: 40***

1. Prepare a chart on different types of joint stock companies with examples. **10**
2. Visit nearby business enterprises / companies and prepare a report on the following: **10**
   a) Nature and Type of business being run by them.
   b) Products and Services provided by them.
3. Role play on understanding the concept of Formal and Informal Communication. **10**
4. Viva **10**

CLASS–XI
GENERAL FOUNDATION COURSE (501)

(Common for Office Secretaryship, Stenography & Computer Application, Accountancy & Taxation, Marketing & Salesmanship, Retail, Financial Market Management and Business Administration)

(Refer to page 14)

CLASS–XII
ELECTIVE
BUSINESS OPERATION & ADMINISTRATION (766)

THEORY

Time: 3 Hours ***Marks: 60***

Content	Topics	Marks
1. Introduction to Management	1.1 Meaning and Definition of Management. 1.2 Importance of Management. 1.3 Characteristics of Management. 1.4 Functions of Management. 1.5 Difference between Management and Administration.	**10**
2. Concept of Management	2.1 Principles of Management. 2.2 Nature of Management. 2.3 Concepts and Thoughts of Management. 2.4 Classical, Neo Classical and Scientific Management.	**8**
3. Functions of Management	3.1 Meaning and Significance of Functions of Management. 3.2 Planning. 3.3 Organising. 3.4 Staffing. 3.5 Directing. 3.6 Coordinating. 3.7 Controlling.	**10**

4. Communication	4.1 Meaning and Definition of Communication. 4.2 Significance of Communication. 4.3 Types of Communication. 4.4 Features of Effective Communication. 4.5 Hurdles of Communication.	**5**
5. Motivation	5.1 Meaning, Definition and Significance of Motivation. 5.2 Types of Motivation. 5.3 Motivational Theories. 5.4 Difference between Motivation and Inspiration.	**8**
6. Leadership	6.1 Meaning, Definition and Importance of Leadership. 6.2 Types of Leaders. 6.3 Characteristics of a Good Leader. 6.4 Leadership Styles.	**7**
7. Social Responsibility of Business	7.1 Business and Society. 7.2 Concept of Social Responsibility. 7.3 Importance of Social Responsiblity. 7.4 Corporate Social Responsibility.	**5**
8. Information Technology and Business	8.1 Meaning, Definition and Importance of Information Technology. 8.2 Information Technology in Functional Areas of Business. 8.3 Meaning and Scope of E-business. 8.4 Merits and Demerits of E-business	**7**

PRACTICAL

Time: 2 Hours ***Marks: 40***

1. Prepare a project report on the online retail business firms in India. **10**
2. List out in detail the environment hazards caused by the firms in your nearby/local areas. **10**
3. Role play on comprehending the concept of Motivation based on a case study. **10**
4. Viva **10**

CLASS–XII

GENERAL FOUNDATION COURSE (501)

(Common for Office Secretaryship, Stenography & Computer Application, Accountancy & Taxation, Marketing & Salesmanship, Retail, Financial Market Management and Business Administration)

(Refer to page 24)

LIST OF EQUIPMENTS AND SOFTWARE

1. Computers.
2. Printers.
3. Software like MS-Excel etc.
4. Computer Stationery.

5. Smart Boards to make the subject more interesting.
6. LCD Projector and Screen.

Annexure–1

APPLICATION FORMAT FOR OFFERING VOCATIONAL SUBJECT / COURSES AT SENIOR SECONDARY LEVEL

1. Name of the Course(s) applied for: .....
(with subject codes) .....
.....
.....

2. Name of the School (Complete address) .....
(Also provide Website address if available) .....
.....
.....

3. Affiliation No. .....

4. School ID. .....

5. Name of the Principal .....

- Phone No. .....
- Mobile No. .....
- E-mail .....

6. Infrastructure .....

No. of Students .....
No. of Teachers .....
Student-Teacher Ratio .....
No. of Classrooms .....
Books in Library .....
Total Computers in Computers Labs .....
Specification of Computers .....
Details of Constructed area for .....
Establishing Laboratories .....

7. Name of Teachers for Vocational Course .....
(Qualifications) .....
.....
.....

8. Details of Draft (in favour of **Secretary, CBSE,** Payable at Delhi)

DD No.: ..... Date: ..... **Amount** (in Digits)
.....

Bank Issues: ..... **Amount** (in Words)
.....

Signature & Seal of the Principal

Note: The document complete in all respects may be sent to: **The Director (Vocational Education), Central Board of Secondary Education 2, Community Center, Preet Vihar, New Delhi-110092.**

SENIOR SCHOOL

CURRICULUM

2016-17

VOLUME-IV
(PART-2)

Engineering and
Technology Based Courses

CENTRAL BOARD OF SECONDARY EDUCATION
"SHIKSHA KENDRA", 2, COMMUNITY CENTRE, PREET VIHAR, DELHI – 110 301"

ENGINEERING AND TECHNOLOGY BASED COURSES

1. ELECTRICAL TECHNOLOGY
2. AUTOMOBILE TECHNOLOGY
3. CIVIL ENGINEERING
4. AIR CONDITIONING AND REFRIGERATION TECHNOLOGY
5. ELECTRONICS TECHNOLOGY
6. GEOSPATIAL TECHNOLOGY
7. FOUNDRY TECHNOLOGY
8. TRANSPORT SYSTEMS AND LOGISTIC MANAGEMENT
9. IT APPLICATION

ELECTRICAL TECHNOLOGY

Introduction

After successfully completing the two years of Senior Secondary Vocational Course the student would have acquired relevant appropriate and adequate technical knowledge together with professional skills and competencies in the field of Electrical Technology so that he/she is properly equipped to take up gainful employment in this vocation.

Thus he/she should have acquired:

A. Understanding of

(a) The relevant basic concepts and principles in basic science subjects (Physics, Chemistry and Mathematics) so that he/she is able to understand the different vocational subjects.

(b) The basic concepts in engineering drawing.

(c) The concepts, principles of working, maintenance, constructional details and functions of electrical motors, electrical appliances, measuring and testing instruments and electrical circuits.

(d) Testing, installation, fault identification and repairing of electrical motors, appliances and instruments.

(e) Different types of electrical wiring.

B. Adequate Professional Skills and Competencies in

(a) Testing, installation, commissioning, fault location, repairing, servicing and major repairs of electrical motors, appliances and instruments.

(b) Undertaking complete house wiring jobs, testing, location of faults and repairing of house wiring.

C. A Healthy and Professional Attitude so that He/She has

(a) An analytical approach while working on a job.

(b) An open mind while locating/rectifying faults.

(c) Respect for working with his/her own hands.

(d) Respect for honesty, punctuality and truthfulness.

CLASS–XI
ELECTIVE
BASIC ELECTRICITY (787)
THEORY

Time: 2 Hours ***Marks: 40***

1. Current Electricity 4

Electricity as a source of energy, Definition of Resistance, Voltage, Current, Power, Energy and their units, Relation between electrical, mechanical and thermal units, Factors affecting resistance of a conductor, Temperature co-efficient of resistance, Difference between AC and DC voltage and current.

2. D.C. Circuits 5

Ohm's Law, Series – parallel resistance circuits, calculation of equivalent resistance, Kirchhoff's Laws and their applications.

3. Electric Cells 5

Primary cell, wet cell, dry cell, battery, series and parallel connections of cells, Secondary cells, Lead Acid Cell, Discharging and recharging of cells, common charging methods, preparation of electrolyte, care and maintenance of secondary cells.

4. Heating and Lighting Effects of Current 5

Joule's Law of electric heating and its domestic applications, heating efficiency, lighting effect of electric current, filaments used in lamps, and gaseous discharge lamps, their working and applications.

5. Capacitors 5

Capacitor and its capacity, Concept of charging and Discharging of capacitors, Types of Capacitors and their use in circuits, Series and parallel connection of capacitors, Energy stored in a capacitor.

6. Electromagnetic Effects 7

Permanent magnets and Electromagnets, their construction and use, Polarities of an electromagnet and rules for finding them.

Faraday's Laws of Electromagnetic Induction, Dynamically induced e.m.f., its magnitude and induction, Static induction, self-induced e.m.f., its magnitude and direction, inductance and its unit. Mutually induced e.m.f., its magnitude and direction, Energy stored in an inductance.

Force acting on a current carrying conductor in magnetic field, its magnitude and direction, Torque produced on a current carrying coil in a magnetic field, Principles and construction of dynamo.

7. A.C Circuits 9

Generation of A.C. voltage, its generation and wave shape. Cycle, frequency, peak value (maximum value), average value, instantaneous value , R.M.S. value, form factor, crest factor, phase, phase difference, power and power factor, A.C. Series Circuits with (i) resistance and inductance (ii) resistance and capacitance and (iii) resistance inductance and capacitance, Q factor of R.L.C. series circuits.

PRACTICAL

Time: 3 Hours ***Marks: 60***

1. Verify that resistance of conductor is directly proportional to resistivity and length and inversely proportional to cross- sectional area of the conductor.
2. Verification of Ohm's Law.
3. Verification of temperature co-efficient of resistance:
   (i) Positive for Tungsten and Nichrome and
   (ii) Negative for carbon.
4. Study of series resistive circuits.
5. Study of parallel resistive circuits.
6. Study of series and parallel connection of cells in circuits.
7. Preparation of Electrolyte for lead acid battery and its charging and measurement of Specific gravity with the help of hydrometer.
8. To find heat efficiency of an electric kettle.
9. Charging and Discharging of a capacitor.
10. Verification of magnetic field of a Solenoid with .
    (i) Iron core and
    (ii) Air core.
11. Verification of Faraday's Laws of electromagnetic induction.

12. Verification of Torque development in a current carrying coil in magnetic field.
13. Study of R.L. series circuit and measurement of power and power factor.
14. Study of R.C. series circuit and measurement of power and power factor.
15. Study of R.L.C. series circuit and measurement of power and power factor.
16. Study of R.L.C. series circuit for calculation of inductive reactance, capacitive reactance, impedance and Q-Factor.

PRACTICAL GUIDELINES

Parameters	Marks
Project / Practical Activities.	15
Viva Based on Project.	10
Practical File / Report or Portfolio.	10
Demonstration of skill Competency in Lab Activities.	25
Total	**60**

CLASS–XI
ELECTIVE
ENGINEERING SCIENCE (788)
THEORY

Time: 2 Hours ***Marks: 40***

1. Dimensioning Techniques — 4

Necessity of techniques, methods and principles, dimensioning of chamfered portions, hatched figures, countersunk holes, irregular figures, scales.

2. Principles of Projections – I — 5

Third angle projections – principles of orthographic projections, three views of given object, six views, exercise in auxiliary views, centre line and extension line.

3. Sections — 4

Importance, methods of representing, conventional sections of various materials, classification of sections, conventions.

4. Pictorial and Isometric Views — 5

Isometric axis, oblique drawing axonometric views, pictorial view from two or three views, isometric views (introduction) and exercise, conical projections, tracing, blue printing and ammonia printing.

5. Working Drawing/ Details and Assembly — 4

Principles of detailed and assembly drawing, detailed working drawing by actual measurement of a job already prepared practical exercise in drawing from detailed assembly and vice versa using actual job prepared in workshop.

6. Soldering and Brazing — 4

General characteristics of soldering, brazing joints, processes and their characteristics, brief description of soldering and brazing tools equipment, types of solders and fluxes and their uses, soldering defects and their remedies, brazing materials, advantages and disadvantages of soldering and brazing.

7. Measuring Instruments — 6

Construction and working principles of moving iron and moving coil voltmeters and ammeters, dynamometer type wattmeter, ohm meter, megger and induction type energy meter- their circuit connection and application for measurement of electrical quantities.

8. Electrical Engineering Drawing 4

Schematic and wiring diagram for domestic simple wiring, symbols used for different electrical devices and equipments.

9. Electrical wiring 4

Types of wiring – cleat wiring, casing and capping, C.T.S./T.R.S. wiring, metal sheath wiring, conduit wiring and concealed wiring – their procedure.

Factors of selection of a particular wiring system, importance of switch, fuse and earthing of wiring system, types of faults, their causes and remedies.

Types of earthing- plate earthing and Pipe earthing, their procedure and application.

Methods of finding numbers of circuits and circuit distribution by distribution board system, loop in system of wiring connections IE rules related to wiring.

BIS regulations, recommendations and NE pertaining to wiring installation IE regulation related to Earthing.

PRACTICAL

Time: 3 Hours ***Marks: 60***

1. Fitting Shop: Introduction to tools and measuring instruments, their safe keeping, safety precautions, practical exercises involving sawing, fitting, marking, squareness, chipping.
2. Description of work bench, work holding devices, care and maintenance of various tools used in fitting, fitting practice, checking by straight edge and tri square, specifications of files, precautions while filing, jobs on drilling and tapping.
3. Sheet Metal Shop: Description of tools and operations involved in sheet metal fabrication such as shearing, bending, joining (locked groves, joint, riveting, soldering, brazing, exercise) like tray mug, funnel etc.
4. Measurement of resistance by ammeter and voltmeter method and Ohm meter.
5. Dismantling and reassembly of dynamo.
6. Calibration of ammeter, voltmeter and wattmeter with the help of standard meters.
7. Calibration of single phase energy meter with the help of standard wattmeter and stop watch.
8. Controlling lamps in series, parallel and series parallel.
9. Controlling lamps for two or three places.
10. Drawing schematic diagram to give supply to consumers.
11. Practice on casing and capping wiring.
12. Practice on cleat wiring.
13. Practice on CTS/TRS wiring.
14. Practice on metal sheet weather proof rigid PVC wiring.
15. Practice on conduit wiring.
16. Practice on concealed wiring.
17. Measurement of insulation resistance of wiring installation by megger.
18. Polarity test of wiring installation.
19. Testing of wiring installation.
20. Installation of pipe earthing for wiring installation.
21. Installation of plate earthing for wiring installation.

PRACTICAL GUIDELINES

Parameters	Marks
Project / Practical Activities.	15
Viva Based on Project.	10
Practical File / Report or Portfolio.	10
Demonstration of skill Competency in Lab Activities.	25
Total	**60**

CLASS–XI

GENERAL FOUNDATION COURSE (501)

(Common for Engineering & Technology Based Courses)

Time: 3 Hours ***Marks: 100***

Part–I: (Compulsory to all Vocational Courses) *Marks: 50*

A. Business Management and Entrepreneurship 30

(a) **Entrepreneurship Orientation** **5**
Importance and relevance in real life: Emphasis on self employment.

(b) **Entrepreneurship Values and Attitudes** **5**
Innovativeness, Independence, Risk Taking, Analytical ability.

(c) **Entrepreneurial Motivation** **5**
Achievement Planning, personal efficacy, entrepreneurial goal setting.

(d) **Launching of a Business Venture** **15**
Identification of project, steps in setting up a business, information about various institutions providing assistance, project formulation.

B. Computational Skills 10

(a) Percentage, ratio & proportion, profit & loss, discount, simple and compound interest, population growth and depreciation of value of articles using logarithm. **6**

(b) Area and volume: rectangle, parallelogram, circle, cube, cone, cylinder & sphere. **4**

C. Environmental Education 5

(a) Environment and the society.

(b) Environment properties risks in different economic enterprises, in use of raw materials, in processing / manufacturing and designing.

(c) Poverty and environment.

D. Rural Development 5

(a) Agriculture, the back bone of Indian Economy.

(b) Rural development projects in India including Integrated rural development programme.

(c) Agro based rural industries.

(d) Community approach to rural development.

Part–II: Applied Physics *Marks: 30*

1. **Units & Dimensions:** M.K.S. fundamentals & derived units, S.I. base units supplementary units and derived units, Dimensions of various physical quantities, uses of dimensional analysis. **2**

2. **Surface Tension and Viscosity:** molecular forces, molecular theory of surface tension, surface energy, capillary action, concept of viscosity, coefficient of viscosity, principle and construction of viscometers. **2**

3. **Vibrations:** Vibration as simple spring mass system, elementary and qualitative concept of free and forced vibrations, resonance. Effects of vibrations on building bridges and machines members. **3**

4. **Heat:** Temperature and its measurement, thermoelectric, platinum resistance thermometers and pyrometers. Conduction through compound media and laws of radiations. **3**

5. **Ultrasonics:** Productions of ultrasonic waves by magnetostriction and piezo-electric effect, application of ultrasonics in industry. **3**

6. **Optics:** Nature of light, reflection and refraction of a wave from a plane surface. Overhead projector and Epidiascope. **3**

7. **Electrostatics:** Coloumb's law, electric field, potential, electric flux, gauss theorem and the electric field, around a charged sphere, a long straight conductor and plane charged sheet, potential difference, and potential of a charged sphere and a point charge, principle of capacitor, capacitance of a parallel plate capacitor having a number of media, energy stored in capacitor and combination of capacitor. **4**

8. **Electromagnetism:** Magnetic field around a current carrying conductor and its direction, concept of B & H and permeability, force experienced by a moving charge and current carrying conductor placed in a magnetic field. Magnetic field at the centre of a circular coil, straight conductor and solenoid. **4**

9. **Nuclear Physics:** Nuclear fission and fusion, use of radio isotopes, the application of nuclear fission in nuclear power station, nuclear fuels, radiation hazard. **3**

10. **Basic Electronics:** Semi conductors and their resistivity. Atomic structure of Ge & Si, P & N type materials, formation of P-N and N-P junctions, forward and backward raising working of semiconductor diode, and its application in half wave and full wave rectifiers, P-N-P and N-P-N transistors and their principles of working. **3**

PRACTICAL

Time: 1 Hour ***Marks: 20***

1. To determine the surface tension of a liquid by rise in capillary.
2. To determine the viscosity of a given liquid.
3. To determine the frequency of tuning fork using a sonometer.
4. To determine the frequency of AC main using sonometer.
5. Draw forward and reverse characteristics of P & N junctions.
6. To find resistivity of a given metal by using metere-bridge.
7. To compare e.m.f. of two cells by using a potentiometer.
8. To determine 'K' of a bad conductor.
9. To determine 'K' of a good conductor.
10. Time period of a cantilever.

CLASS–XII
ELECTIVE
ELECTRICAL MACHINES (787)
THEORY

Time: 2 Hours ***Marks: 40***

1. **Single-Phase Transformer** **8**

Types of transformer - step-up and step-down transformer, voltage and current transformer, auto-transformer. Construction, working principles and applications of different types of transformers, rewinding of transformers, cooling of transformers.

2. D.C. Motors **12**

Types of motor - series, shunt, compound and universal, construction, working principles, characteristics, winding details and applications of different types of motors including fractional horse power, starting and starters for D.C. motors. Installation of D.C. motor and testing, speed reversal and speed control of D.C. motors, common faults, their causes, testing and repairs.

3. Three Phase Induction Motors: Principle, working & starting of three phase induction motor. **4**

4. Single Phase A.C. Motor **12**

Types of A.C. Motors – induction motor (Split phase and repulsion start), capacitor motor, shaded pole motor, universal motor, construction, working principles, special characteristics, winding details and applications of different types of fractional horse power motors. Starting and starters for different motors. Speed reversal and speed control of A.C. Motors, installation of A.C. motor and testing, common faults, their causes, testing and repairs, rewinding of fractional h.p. motors.

5. Electrical Solders: Types of Solders, flux and methods, techniques of soldering. **4**

PRACTICAL

Time: 3 Hours ***Marks: 60***

1. To test and repair a defective cycle dynamo.
2. Dismantling, study and reassembling of a D.C. motor.
3. Measurement of resistance of series, shunt field and armature of a given D.C. motor and identification of terminals by multimeter.
4. Measurement of insulation resistance of armature and field.
5. Testing, fault finding and repair of a D.C. motor.
6. Overhauling of a D.C. motor.
7. Dismantling, study and reassembling of a D.C. motor starter.
8. To study D.C. series motor, its running, speed control and reversing rotation and measurement of current, voltage and speed.
9. To study D.C. shunt motor, its running, speed control and reversing rotation and measurement of current, voltage and speed.
10. To study D.C. compound motor, its running, speed control and reversing rotation and measurement of current, voltage and speed.
11. To study D.C. universal motor, its running, speed control and reversing rotation and measurement of current, voltage and speed.
12. Identification of semi-conductor devices.
13. To draw forward & reverse characteristics of given semiconductor diode.
14. Study of transistor circuits: (i) Common Base, (ii) Common Emitter, and (iii) Common Collector.
15. Study of a half-wave rectifier circuit with and without filter.
16. Study of a full-wave rectifier circuit with centre tap transformer with and without filter.
17. Study of bridge rectifier circuit with and without filter.

18. Study of transistor amplifier circuits: (i) Common Base, (ii) Common Emitter and (iii) Common Collector.
19. Study of (i) Voltage Transformer, (ii) Current Transformer and (iii) Auto-Transformer.
20. To rewind the given 230/12 v transformer.
21. Dismantling, study and reassembling of an A.C. motor.
22. Overhauling of an A.C. motor.
23. Dismantling, study and reassembling of an A.C. motor starter.
24. Testing, fault finding and repair of an A.C. motor starter.
25. Connecting, starting, running and reversing of a three phase squirrel cage induction motor.
26. Connecting, starting, running of a shaded pole motor.
27. Connecting, starting, running and reversing of a capacitor start/run motor.
28. Connecting, starting, running and reversing of an A.C. Universal motor.
29. Installation of D.C. motor.
30. Installation of A.C. motor.
31. Study of DOL starter for starting three phase induction motor.

MARKING SCHEME

Marks: 60

Note:

1. The marks for sessional work will be awarded by the teacher concerned and included in the final award.
2. Students may be asked to perform any one of the experiments listed above.

DISTRIBUTION OF MARKS

1. Sessional Work **10**

(a) All listed practical performed.

(b) Maintenance of proper records pertaining to sessional and On-Job-Training.

2. Experiment(s) **40**

(a) List of material/tools/equipment.

(b) Circuit/connection diagram (wherever diagram is not applicable then these marks should be clubbed with performance of experiments).

(c) Performance of experiment(s).

3. Viva Vioce **10**

(a) Question related to the experiment assigned.

(b) Question related to the remaining experiments.

CLASS–XII
ELECTIVE
ELECTRICAL APPLIANCES (788)
THEORY

Time: 2 Hours ***Marks: 40***

1. Electric Room Heater: 2

Construction and working principle of reflector type room heater, common defects, testing and repairs.

2. Electric Iron 2

Types of electric iron – ordinary type and automatic / thermostat control type – construction and working principles of electric irons. Common defects testing and repairs.

3. Electric Stove 3

Types of electric stoves- coiled type, covered type, hot plate, grill/oven, cooking range – construction and working principle of electric stoves, common defects, testing and repairs, induction heater, OTG & microwave oven.

4. Electric Toaster 3

Types of toasters – ordinary and automatic. Construction and working principle of electric toasters. Common defects, testing and repairs.

5. Immersion Heater and Geyser 2

Construction, working principle and use of immersion heater. Common faults – their causes, testing and repairs. Construction, working principles and use of geyser and thermostat, common defects, their causes, testing and repairs. Testing and installation of geyser. Precautions in using immersion heater and geyser.

6. Electric Kettle and Coffee Percolator 2

Working principle and use of electric kettle (all types) and coffee percolator. Common faults, their causes, testing and repair.

7. Electric Room Heater 2

Construction and working principle of blower type room heater. Heat convector – common defects, their causes, testing and repair.

8. Electric Fans 2

Types of fans – ceiling fan, pedestal fan, table fan, bracket fan, exhaust fan, construction, working principles. Characteristics and applications of electric fans. Common faults, their causes testing and repairs, installation of all purpose fan and exhaust fan.

9. Electric Mixer, Grinder and Blender 3

Construction, working principles, characteristics and applications of electric mixer, grinder and blender. Common faults, their causes, testing and repairs, servicing, maintenance and over.

10. Electric Washing Machine 2

Construction, working principles, special features and applications of washing machine, Common faults, their causes, testing and repair, repairing, servicing, maintenance and overhauling of washing machine.

11. Hair Dryer/Curler 2

Construction and working principles of hair dryer/curler, Common faults, their causes testing and repair.

12. Room Cooler 2

Construction and working details of room cooler, desert cooler, Common cooler faults, their causes, testing and repair, Installation of room cooler/desert cooler.

13. Vacuum Cleaner 2

Construction and working principles of vacuum cleaner, common faults, their causes, testing and repair.

14. Emergency Light and Voltage Stabilizer 3

Construction and working principles of emergency light and voltage stabilizer (manual and automatic), Common faults – their causes, testing and repair.

15. Electric Hand Drill 2

Construction and working principles of electric hand drill, common faults, their causes, testing and repair.

16. Electric Motor Used in Domestic Appliances 4

Split phase, capacitor start, capacitor-run, shaded-pole motors, two speed motors, reverse motors, universal motors, components testing, trouble shooting, and servicing.

17. Basic Occupational and Safety Practices 2

Safety signs, lighting and handling loads, moving heavy equipments, Electrical safety- safety practices- first aid, Practice safe methods- lifting and handling of heavy objects, Rescue a person from live wire, Artificial respiration- Nelson's arm and Schafer's Method.

PRACTICAL

Time: 3 Hours ***Marks: 60***

1. Dismantling reassembling of reflector type room heater.
2. Testing and repair of reflector type room heater.
3. Dismantling and reassembling of electric iron (i) ordinary type and (ii) automatic thermostat control type.
4. Testing and repair of electric iron (i) ordinary type and (ii) automatic / thermostat control type.
5. Dismantling and reassembling of electric stove (i) coiled type, (ii) covered type- (a) hot plate, (b) grill or hot case.
6. Testing and repair of electric stove (i) coiled type, (ii) covered type – (a) hot plate, (b) grill or hot case.
7. Dismantling and reassembling of cooking range/oven.
8. Testing and repair of cooking range/oven.
9. Dismantling and reassembling of electric toaster:
   (i) Ordinary, (ii) semi automatic, (iii) automatic with thermostat.
10. Testing and repair of electric toaster:
    (i) Ordinary, (ii) semi automatic, (iii) automatic.
11. Dismantling and reassembling of geyser: (i) instant, (ii) storage.
12. Testing and repair of geyser: (i) storage, (ii) instant.
13. Dismantling and reassembling of electric kettles (all types) and coffee percolator.
14. Testing and repair of: (i) electric kettle (all types) and (ii) coffee percolator.
15. Connection of fluorescent tube-lamp circuit.
16. Testing and repair of: (i) table lamp, (ii) night lamp, (iii) fluorescent tube light.
17. Testing and repair of: (i) electric bell, (ii) buzzer, and (iii) door chimes.
18. Controlling lamp from two or three place.
    (Stair case wiring and godown wiring)
19. To control one lamp with one switch on batton/conduit wiring.
20. To control one lamp and one socket with separate switches on batton/conduit wiring.
21. To prepare series/parallel testing board.
22. To connect fan regulator with a ceiling fan.
23. To fit MCB in a circuit in place of fuse.

24. Measurement of insulation resistance of wiring installation by meggar.
25. Polarity test of installation.
26. Earth testing and measurement of earth resistance.
27. Identification of faults of wiring, installation and rectification.
28. Testing, fault finding, repair and overhauling of blower type room heater and heat connector.
29. Testing, fault finding, repair and overhauling of electrical fans.
30. Testing, fault finding, repair and overhauling (i) electric mixer, (ii) grinder, and (iii) blender.
31. Testing, fault finding, repair and overhauling of washing machine.
32. Testing, fault finding, repair and overhauling of hair dryer.
33. Testing, fault finding, repair and overhauling of room cooler/desert cooler.
34. Testing, fault finding, repair and overhauling of vacuum cleaner.
35. Testing, fault finding, repair of emergency light and voltage stabilizer (manual and automatic).
36. Testing, fault finding, repair and overhauling of electric hand drill machine.
37. Testing, fault finding, repair and overhauling of motors used in domestic appliances.
38. Winding/re-winding of electrical motor used in domestic appliances.
39. To test the given fan with the help of Meggar insulation resistance tester for:
    (i) Insulation resistance between body of the fan and winding.
    (ii) Continuity of windings – starting and running.
40. To study emergency light circuit.

PRACTICAL GUIDELINES

Parameters	Marks
Project / Practical Activities.	15
Viva Based on Project.	10
Practical File / Report or Portfolio.	10
Demonstration of skill Competency in Lab Activities.	25
Total	**60**

CLASS–XII

GENERAL FOUNDATION COURSE (501)

(Common for Engineering & Technology Based Courses)

Time: 3 Hours ***Marks: 100***

Part–I: (Compulsory to all Vocational Courses) *Marks: 50*

A. Business Management and Entrepreneurship 30

Management of Business

Elementary treatment/exposure to basic conceptual frame work of the topic listed below:

(a)= Basic Function. **6**
(b) Marketing Management. **6**
(c) Financial Management. **6**
(d) Production Management. **6**

(e) Personnel Management. **6**

B. Computational Skills **10**

1. (a) Solution of linear equations and their application to problem of commercial mathematics. **5**

   (b) System of linear equations and in equation in two variables. Applications in formation of simple linear programming problems.

2. Statistics: Raw data, bar charts and Histogram; Frequency Tables; Frequency Polygon; Ogive; Menu, Median and Mode of ungrouped and grouped data; Standard Deviation; Introduction to Mortality tables; Price Index etc. Introduction to Computers. **5**

C. Environmental Education & Rural Development **10**

1. **Environmental Education** **5**

   (a) Modernisation of agriculture and environment, irrigation, water logging, use of fertilisers, pesticides, soil erosion, land degradation (desertification and deforestation), silting and drying of water resources.

   (b) Rational utilisation, conservation and regeneration of environmental resources (soil, air, water, plant, energy, minerals).

2. **Rural Development** **5**

   Principles and goals of rural development, major problems/constraints in rural development in India.

Part–II: Applied Chemistry *Marks: 30*

1. **Structure of Atom:** Rutherford model of the structure of atom, Bohr's theory of electrons, quantum numbers and their significance, de-Broglie equation and uncertainty principle, electronic configuration of 1 to 30 elements. **3**

2. **Periodic Properties of Elements:** Periodic law, periodic table, periodicity in properties like atomic radii and volume, ionic radii, ionization energy and electron affinity. Division of elements into s.p.d. and f blocks. **3**

3. **Chemical Bonds:** Electrovalent, covalent and coordinate bond and their properties. Metallic bonding (electron cloud mode) and properties (like texture, conductance, luster, ductility and malleability). **3**

4. **Fuel and their Classification:** Definition, characteristics, classification into solid, liquid and gaseous fuel. petroleum and brief idea of refining into various factions and their characteristics and uses. Calorific value of fuel, Gaseous fuels- preparation, properties, composition and use of producer gas, water and oil gas. **3**

5. **Water:** Impurities in water, methods of their removal, hardness of water, its types, causes and removal, disadvantages of hard water in boilers, pH value and its determination by calorimetric method. **3**

6. Problems based on Gravimetric and Volumetric Analysis. **3**

7. **Metals:** Cast iron and its properties, effect of sulphur, silicon and phosphorus as impurities in cast iron. Elementary knowledge of heat treatment of steels - hardening tempering annealing, normalizing and case hardening. **3**

8. **Alloys:** Definition, classification and necessity for making alloys. Composition, properties and uses of following alloys: Brass, Bronze, Gun-metal and Duralumin. Effect of carbon, nickel, chromium, manganese on steel. **3**

9. **Corrosion:** Its meaning, theory of corrosion, prevention of corrosion by various methods using metallic and non-metallic coatings. **3**

10. **Plastic and Polymers:** Plastic-thermo-plastic and thermo-setting. Introduction of Polythene. P.V.C. Nylon, synthetic rubber and phenol-formal-dehyde resin, their application in industry. **3**

PRACTICAL

Time: 1 Hour ***Marks: 20***

1. To find the strength in grams per litre of the given solution of sodium hydroxide with the help of standard oxalic acid solution.

2. Find the strength in grams per litre of given sodium hydroxide solution with the help of standard sodium-carbonate solution and intermediate solution of an acid.
3. Determine the strength of oxalic acid solution in grams per litre using standard oxalic acid and intermediate solution of potassium permanganate.
4. Determine the total alkalinity in ppm in the given sample of water using standard sulphuric acid.
5. To find the amount of chloride ions present in water using silver nitrate solution (potassium chromate as indicator).
6. Estimate the amount of copper in the given sample of copper sulphate or copper alloy solution using a standard solution of sodium thiosulphate.
7. Estimate the amount of ash in the given sample or coal or coke or charcoal.
8. Estimate the amount of moisture in the given sample coal or coke.
9. Study the reaction of dilute and concentrated acid with any two metals (irons, copper, zinic, magnesium).
10. To arrange Mg, Zn, Fe, Fb, Sn, Cu according to their activity by studding the interaction of these metals with their salt solutions.
11. To determine the pH value of water.

LIST OF EQUIPMENTS, TOOLS AND INSTRUMENTS

1. Work Bench 1.8 m × 1.2 m and 1.5 m × 1.5 m, Heavy duty legs 7.5 cm × 7.5 cm with one 2.5 cm thick top of Shisham and hard wood with spirit polish.
2. Bench Vice – 1 No. 2 No. 3 No. 4 No. Size
   6 each 6 each 2 each 2 each
3. Pipe Vice : 2 Nos., size - 1 No.
4. Hammers Ball Pien, 100 gms. 6 each
   Ball Pien, 0.25 kg. 6 each
   Ball Pien, 0.5 kg. 4 each
   Ball Pien, 1 kg. 2 each
   Ball Pien, 2.5 kg. 1 No.
5. Mallets of wood different size. 6 each
6. Hammers of Plastic head (Plastic Mallets) of different size. 3 each size
7. Micrometer 0 to 25 mm Japanese Mitutoyo. 2 No.
8. Inside Micrometer 5 to 30 mm Japanese Mitutoyo. 2 No.
9. Depth gauge 20 cm Mitutoyo. 1 No.
10. Try Square 15 cm Japanese or English. 6 No.
11. Marking Blocks Adjustable. 2 sets
12. V. Block 7.5 cm one set with clamp. 2 sets
13. Surface plate 45 cm × 45 cm. 1 No.
14. Centre Punch 10 cm length. 10 No.
15. Wire gauge SWG. 1 No.
16. Files of different length, grade and shapes Length (10 cm to 30 cm), Grade Bastered, smooth dead smooth. Shapes flat, Round, Half round, Triangular, Square, knife edge, Mill file, wooden file (Rasp file). 6 each
    Needle files of different shapes. 3 each
17. Cold Chiesel 15 cm to 20 cm. 6 Nos.
    Taparia/Jhalani or other standard make.

18.	Drills High speed steel 0.5 mm to 6 mm, 1/6.	3 + 3 set
	I.T. Make 6 mm to 18 mm, $1/4^3$ to $3./4^3$.	1 + 1 set
19.	Crimping Tools.	2 No.
20.	Diamond Tip Glass Cutter.	2 No.
21.	Hand Reamers 20 mm or other required size.	1 No.
22.	Tap sets with handle $1/8^3$ to $3/8^3$ BSW.	1 Set
	Tap set with handle $3/16^3$ to $3/8^3$ BSF.	1 Set
	Tap sets with handle 0^3 to 10^3 BA.	1 Set
23.	Dies sets with stocks $1/8^3$ to $3/8^3$ BSW.	1 Set
	Dies sets with stocks $3/16^3$ to $3/8^3$ BSF.	1 Set
	Dies sets with stocks 0^3 to 10^3 BA.	1 Set
24.	Screw Driver Non breakable handle Assorted.	2 Set
25.	Philips Head Screw Driver – Set of 10 Nos.	2 Sets
26.	Pliers – Combination Insulated 15 cm, Long Nose, 15 cm, Side Cutting,	
	Pliers 15 cm, Flat Nose 15 cm, Round Nose 15 cm.	10 Nos. each
	Bend Nose 15 cm.	2 No
27.	Round Nose Seal Remover Pliers 20 cm.	2 No.
28.	Adjustable Wrench 25 cm – 30 cm.	2 each
29.	Pipe Wrench 25 cm – 2.5 cm.	2 Nos. each
30.	Pipe type spanner set of 8 – Spanners – SURA make.	1 Set
31.	Double End open spanner set of 12 spanners.	2 Sets
32.	Ring Spanners set of 24 spanners.	1 Set
	Make Jhalani / Taparia.	
33.	Box Spanner – set of 24 spanners.	1 Set
	Make Jhalani / Taparia or imported.	
34.	T. spanner set from 4 No. to 13 No.	2 Set
35.	Allen Key set – Set of 12 pcs.	1 Set
36.	Bearing/Pulley Puller.	1 No.
37.	Grease Gun manual Operated.	1 No.
38.	Oil cane.	1 No.
39.	Oil Stove.	1 No.
40.	Blower Stove	. 2 No
41.	Scissor 20 cm.	6 Nos.
42.	Sheet cutter 25 cm Blade length.	2 Nos.
43.	Rawl Plugs.	5 Sets
44.	Wooden saw 30 cm to 45 cm.	10 Nos.
45.	Adjustable Hacksaw.	10 Nos.
46.	Fix Hacksaw.	10 Nos.
47.	Junior Saw.	2 Nos.
48.	Wooden Chisels (Sathari)/(Chaursi).	10 each
49.	Electrician Knife.	20 Nos.

50.	Photo cutter (9^3 and 1^3).	1 each
51.	Poker.	20 N
52.	Scale 15 cm and 30 cm stainless steel Japanese make.	10 each
53.	Wooden Planer Wood.	10 Nos.
	Steel Planer (Anant Make).	5 Nos.
54.	Wooden Planner for Design for one sided for groove with accessories.	2 Sets
55.	Phase or Neon tester (Taparia).	20 Nos.
56.	Morce Taper Socket 2.3 for drill machine.	1 No
57.	Soldering Iron 35 Watts to 120 Watts, 35 Watts and 65 Watts (make Raj/Toni).	10 Nos. each
	120 Watts (Raj/Toni make).	2 Nos.
	15 WAtts.	10 Nos.
58.	Thermocouple prone type for temp.control.	2 Nos.
	Thermocouple rod type for temp.control.	2 Nos.
59.	Bimetallic relay (Faridge and other relays).	2 Nos.
60.	Thermostat for refrigerator, for Geyser, for Hot case.	2 Nos. each
61.	Dynamo D.C. small (Cycle Dynamo).	5 Nos.
62.	Universal motor – 1/4 HP and 1/2 HP.	1 No. each
63.	Soldering Iron stand.	20 Nos.
64.	Demonstrational Transformer Ratio 1 : 1.	
	230/230 V with 25%, 50%, 85.6% voltage tapping on both side.	3 Nos.
65.	Air Break Contractor.	2 Nos.
66.	Voltage Transformer 440 V/110 V.	2 Nos.
67.	Current transformer 5/100 amps.	2 Nos.
68.	Auto Transformer 0 to 270 V 15 amps.single phase AE.	2 Nos
69.	Electrical Sprayer Pilot – make 800 gram capacity.	1 No.
70.	D.O.L. Starter – Make GEC, Cromptom, Kirlosker, ABB upto 5 HP 3.	3 Nos.
71.	Star Delta Starter – Manually operated upto 15 HP.	2 Nos.
72.	Star Delta Starter – Semi Automatic upto 15 HP.	2 Nos.
73.	Star Delta Starter – Fully automatic with additional accessories upto 10 HP.	2 Nos.
74.	Torch of 4 cells portable.	2 Nos.
75.	Flourescent Tube Fixture with choke and starter complete.	10 Nos.
76.	Heating Element of different types used in industrial closed type Heating elements as Round Kettle and type other shapes.	2 ea
77.	3 Phase Reversing switch L & T, other best make.	2 each type
78.	Rotary Switches of different types as AGI make R 416, R 316, R 216, 216 K, 216 KF, RT 415, R 415 F, R 415 D.	2 Nos. each
79.	I.C.T.P. and I.C.D.P. Main switches.	4 each
80.	Distribution Boards.	2 Nos.
81.	Bus Bar.	2 Nos.
82.	Old Ceiling fan with complete parts.	4 Nos.
83.	Old Table fan with complete parts.	4 Nos.

84. Exhaust fan with complete parts. 4 Nos.

85. Old Shaded pole Motor 1/2 HP. 4 Nos

86. Different types of Centrifugal Switch Assembly complete make Cromptom/GEC etc. 4 Nos. each

87. Single Phase capacitor start capacitor run Motor. 2 Nos.

88. Single Phase 1440 RPM old motor with complete parts. 2 Nos.

89. A.C. Induction squirrel cage 3 phase motor 1440 RPM old with complete parts. 2 Nos.

90. Hand drill Machine 6 mm capacity. 10 Nos.

91. Electrical Gun drill machine-portable 6 mm max. capacity High speed with accessories 1 No.

92. Electrical Gun drill machine portable 12 mm capacity low speed with accessories. 1 No.

93. Bench Drill machine pillar type capacity upto 12 mm or 18 mm Taper Drill and 9 mm Drill chuck capacity with all accessories and Drill chuck with key with motor single phase or 3 phase 1 HP as per facility of electricity available in the lab. 1 No

94. Bench Grinder 1 HP 220 V, Single Phase, Three Phase power 2880 RPM with one smooth and one medium grinding wheel of Carborundum. 1 No.

95. Electrical Welding machine upto 250 AMp.capacity single phase 250 Volt AC supply oil filled tank type or air cooled type with all accessories as screen, welding lead and holder, earth clamp etc. 1 Set

96. Winding Machine for Motor coil winding Hand operated. 2 Nos.

97. Winding Machine for Transformer winding hand operated single coil. 1 No.

98. D.C. Motor series – 1 HP, D.C. Motor Shunt-1 HP RMP 1500. 1 No.

D.C. Motor Compound – 1 HP RMP 1500. 1 No.

99. A.C. Motor, Single Phase, condenser Start Motor 1/2 HP and 1 HP. 1 each

100. Single phase condenser run motor Fractional H.P. 3 Nos.

101. Three Phase Induction Motor 2 HP, 410 V, 1450 RMP. 1 No.

102. Shade Pole Motor 1/2 HP, 1/4 HP or small. 2 each

103. Demonstrational AC Single phase Squirrel cage induction conden Run F.H.P. Motor all terminal of Motors. Condenser mounted on Bakelite plate of 12 mm thickness fitted with motor on separate Mild Steel Channels.2 Nos.

104. Demonstrational type A.C. Single phase squirrel cage inducation condenser start Motor 1/2 HP terminals of running winding, starting winding, condenser and centrifugal switches, mounted on bakelite 12 mm thick plate fitted with motor on separate mild steel channels. 2 Nos.

105. Demonstrational Model for study of Transistor circuits (circuit fitted on sun mica 3 mm board with proper terminals I. common base, II. common emitter, III. common collector. 2 Nos.

106. Demonstrational Model for study of Transistor Amplifier circuit I common base II common Emitter III common collector. Circuit fitted on sun mica board with proper Terminals. 2 Nos.

107. Solenoid coil of copper wire (HTP) Highly insulated bobin (Formula R of coil) made of mica and bakelite operating on 220 V. Copper Wire 29 SWG, length of coil at least 10 cm with two terminals mounted on side of coil. Coil will be fixed on 12 mm ply and sunmica table or 2 mm sunmica Board with 50 cm wooden or plastic rule and Core Material Free Cutting Grade Steel, Cost Iron, Copper, Brass, Aluminium, Carbon Steel one each.2 Nos.

108. Apparatus for comparison of Aluminium and copper conductivity, resistivity and magnetic field strength. Design-table bedsize 45 cm × 30 cm of 12 mm ply with sunmica/bakelite sheet 3 mm fitted with identical coils (one copper coil wounded and one coil aluminium wounded gauge and turn of wire will be same operating on 220 V one metre rule of wood or plastic will be fitted with screws on both side of coil. Both coils having two terminals on side for connection, core will be permanently fitted inside the coil, core material wrought iron/free cutting grade of steel.

2 Nos.

109. Two heating coils wounded on china clay or procelain rod one coil Ureka/Constantan and one Nichrome wire of same gauge and same wire of length fitted on 30 cm × 38 cm board of bakelite and asbestos sheet fitted on 12 mm Ply board with brass terminal insulated for connection. 2 Nos.

110. Half wave rectification model with filer circuit condenser 25 V 1000 MFD transformer 12–0–12 V I amp. output, one 50 VAC Diode 5408 and 6 terminals, fitted on sunmica board with lead and plug. 2 Nos.

111. Full wave rectification model with center gap earth and filter circuit. Condenser 25 V/1000 Mfd., Transformer 12–0–12 V Amp. output, two Diode 5408–50 VAC, 6 Terminal fitted on Sunmica Board with lead and plug.

112. Full wave rectification model with full wave rectifier bridge (Bridge of 4 Diode) and II Filter Circuit Transformer 12–0–12 V 1 Amp.output, 4 Diode (No. 5408) 50 VAC Condensor 25 V/1000 Mfd. II Filter Circuit with two condensor and choke of 1 Amp. capacity 6 terminal fitted on Sunmica Board with lead and plug.

B. Measuring Instruments

1.	Ammeter MI type 0–5–10 Amps.	4 Nos.
2.	Ammeter MC type 0–1–5 Amps.	2 Nos.
3.	Voltmeter MI type 0–300 Volts.	4 Nos.
4.	Voltmeter MI type 0–600 volts	2 Nos.
5.	Voltmeter MC type 0–300 volts.	2 Nos.
6.	Voltmeter MC type 0–15 volts.	4 Nos.
7.	Watt metreDynameter type 0–300 5 amp./10 amp.	2 Nos.
8.	Energy meter 230 V, 5 amps.	2 Nos.
9.	Insulation megger – 500 volts.	2 Nos.
10.	Earth tester.	1 No.
11.	Neon tester.	2 Nos.
12.	Multimeter.	2 Nos.
13.	Clip on meter.	2 Nos.
14.	Growler inside and outside.	1 No.
15.	Phase sequence indicator.	2 Nos.
16.	Frequency meter Pointer type.	1 No.
17.	Frequency meter digital type.	1 No.
18.	Power factor meter.	1 No. each
	(i) Dimmerstat 230/0–270 V 4 amp.	
	(ii) Rheostat (a) 1 amp. 50 ohm, (b) 10 amp. 8 ohm.	
	(iii) Variable Single Phase Inducter 5/10 amps.	
	(iv) Capacitor 50 MF, 400 Volts.	
19.	Conduct Pipe Tee.	6 Nos.
20.	Bulbs 60 Watts.	1 Dozen

C. Consumable Material

1.	P.V.C. wire 3/22.	4 coils
2.	Wooden Batten 12 mm × 18 mm.	100 meter each size
3.	Casing Copping (Standard Size).	100 meter
4.	Link Clips Standard size.	2 Gross
5.	Nail Standard size 12 mm.	1 Kg

6.	Wooden screws standard size.	4 Dozen each size
7.	Round Blocks standard size.	1 Gross
8.	Wooden Board standard size.	2 Dozen each size
9.	Insulation Tape.	1 Dozen
10.	5 Amps Switch.	2 Dozen
11.	15 Amps Switch.	1 Dozen
12.	Batton Holder.	2 Dozen
13.	Pendant Holder.	1 Dozen
14.	Angle Holder.	1 Dozen
15.	5 Amps 2 way switch.	1 Dozen
16.	Intermediate Switch.	6 Nos.
17.	5 Amps 3 pin plug.	2 Dozen
18.	15 Amps 3 pin plug.	1 Dozen
19.	5 Amps 3 pin shoe.	1 Dozen
20.	15 Amps 3 pin shoe.	1 Dozen
21.	Electric Press Connector.	6 Nos.
22.	Piano Type Switch Saps.	1 Dozen
23.	Conduit Pipe 18 mm, 25 mm.	50 each
24.	Junction Box	. 6 No
25.	Conduit Pipe Tee.	6 M Nos.
26.	Bulbs 60 Watts.	1 Dozen
27.	Grease.	2 Kg.
28.	Lubricating Oil.	5 Litre
29.	Insulating Varnish.	

AUTOMOBILE TECHNOLOGY

Introduction

The present course curriculum intends to educate the students about the initial level of automobile service sector while fulfilling the needs and requirements of the students who are willing to learn activities relating to automobile service sector. It is designed in a way so that the students can begin their study of the design, construction, service, maintenance, and repair of the modern automobile.

This course will develop an interest amongst the students on various aspects of the automobile sector and will simultaneously enable the students to get a general look into the major auto systems, which includes cooling, engine, steering and suspension, transmission, electrical and braking systems. It will also enable the students to perform maintenance and minor repairs to engines, transmissions, rear axles, brakes, tires, cooling and electrical systems, and perform new vehicle preparation. The present course is developed to identify the potential future career opportunities, shop safety, certifications and environmental issues which would enhance the effectiveness of the students in the field.

COURSE OBJECTIVES

After successfully completing the two year of senior secondary vocational course, the student would have acquired relevant appropriate and adequate technical knowledge together with professional skills and competencies in the field of Automobile Engineering, so that he/she is properly equipped to take up gainful employment in this vocation.

Thus he should have acquired

A. Understanding of

(a) The relevant basic concepts and principles in basic science subjects (Physics, Chemistry and Mathematics) so that he/she is able to understand the different vocational subjects.

(b) The basic concepts in engineering drawing.

(c) The concepts, principles of working, constructional details, and functions of major components, assemblies, and sub-assemblies of automobiles, buses, trucks, motor cycles, and scooters.

(d) The proper method of using various tools and measuring equipment commonly used in garrage.

(e) Importance and procedures of preventive, operating and break-down maintenance.

(f) Preparing estimate of repair jobs.

(g) Garrage procedure.

(h) Major vehicle rules.

(i) Specifications of vehicles and their components.

B. Adequate Professional Skill and Competencies in

(a) Use of hand tools, instruments, and garrage equipments.

(b) Dismantling, repair and assembly of different components of vehicles.

(c) Servicing and maintenance of vehicles.

(d) Testing of sub-assemblies and vehicles – before as well as after repairs.

(e) Organising and looking after a repair shop.

(f) Implementing of manufacturers repair and maintenance.

C. A Healthy and Professional Attitude so that He/She has

(a) An analytical approach while working on a vehicle, motor cycle or scooter.

(b) An open mind while locating/rectifying faults in vehicles, motor cycles or scooters.

(c) Respect for working with his own hands.

(d) Respect for honesty, punctuality and truthfulness.

CLASS–XI
ELECTIVE
AUTO ENGINEERING (627)
THEORY

Time: 2.5 Hours+2.5 Hours ***Theory: 50***
Practical: 50

1. Introduction to Automobile **6**

- Introduction to Automobile, classification of vehicles on the basis of load, wheels, final drive, fuel, axles, position of engine, transmission, body.
- Layout of an automobile, function of major components of vehicle and introduction to their different system.

2. Automobile Engine **15**

- Introduction to engine terminology, classification of automobile engines, thermodynamic cycles-Otto cycle, Diesel cycle, four stroke/two stroke petrol and diesel engine (working & comparison), value timing diagrams. Fuel supply system of petrol engine, air filter, fuel tank, fuel filter; A.C. Fuel pump and electric fuel pump, Carburettor - types function and working principle of simple carburettor, different circuits, trouble shooting.
- Fuel supply system of diesel engine, air cleaner/filter, fuel tank, fuel filter, fuel feed pump fuel injection and fuel injector.

3. Transmission System — 12

- Function of clutch, types, working of single plate (helical spring & diaphragm spring types) and multi plate clutch used in cars / Motor Cycles / Scooters etc. trouble shooting.
- Gear box assembly – function, need of gear box, working of a constant mesh and Synchromesh gear box, selector mechanism.

4. Braking System — 10

- Function and principle of braking system, classification, braking systems-constructional details and working of mechanical brake, hydraulic brake, drum brake, disc brakes, servo brake air brake and parking brake.

5. Wheel and Tyres — 7

- Classification of wheel rims, constructional details. Classification, constructional features, function of different types of tyres (tubed & tubeless), Tyres specifications, Causes of tyre wear and their remedies, Tyre maintenance, tyre pressure (over inflation, under inflation, correct) and their effects on vehicle performance.

Note: Practical will be based on aforesaid theory paper.

CLASS–XI
ELECTIVE
AUTO SHOP REPAIR & PRACTICE (628)
THEORY

Time: 2.5 Hours+2.5 Hours — ***Theory: 50*** / ***Practical: 50***

1. Regular Maintenance of an Engine — 15

- Inspection of an engine.
- Washing of an engine.
- Tuning fuel system of an engine.
- Tuning of the ignition system of an engine.
- Tuning engine lubrication system.
- Tuning engine cooling system.
- Checking other engine components (Mechanical Setting).
- Engine Timing and engine sound test after setting.

2. Regular Maintenance of Transmission System — 10

- Transmission system.
- Clutch maintenance.
- Clutch adjustments.

- Overhauling of clutch.

3. Regular Maintenance of Gear **8**

- Lubrication of gear box.
- Setting of gears.

4. Service of Wheels **7**

- Importance of wheels.
- Importance of hub greasing and bearing play adjustments.

5. Regular Maintenance of Tubes and Tyres **5**

- Tyre and its maintenance.
- Tyre puncture.

6. Regular Maintenance of Brakes **5**

- Brakes and maintenance.
- Brakes and adjustment.

Note: Practical will be based on aforesaid theory paper.

CLASS–XI
OPTIONAL
ENGINEERING SCIENCE (622)
(Common for Automobile Technology and Airconditioning & Refrigeration Technology)

THEORY

Time: 3 Hours ***Marks: 70***

A. Engineering Drawing **40**

Drawing, characteristics and types, Drawing instruments, their use and care. IS specifications, Layout and fixing of drawing sheets according to ISI. Free hand sketching and lettering of various sizes and types. **4**

1. **Conventions & Symbols and Materials** **4**
   - Conventional of lines, types, centre of focus line, various types of lines and their use.
   - Conventions for materials.
   - Civil Engineering Sanitary fitting symbols.
   - Electrical fittings symbols and domestic installations.
   - Building plan drawing with electrical and civil Engineering symbols.

2. **Lettering Techniques and Practice** **4**
   - Requirements of good lettering. Freehand printing and numerical in 3, 5 8 and 12 mm sizes vertical and inclined at 75 degrees, General composition of alphabets.
   - Instrumental lettering in single and double stroke in 12 mm.

3. **Dimensioning Techniques** **4**
   - Necessity of techniques, methods and principles, dimensioning of chamfered portions, hatched figures,
     countersunk holes, irregular figures, scales.

4. **Principles of Projections – I** **5**

- Third angle Projections – Principles of orthographic Projections.
- Three views of given object.
- Six views.
- Exercise in auxiliary views.
- Centre Line and extension lines.

5. **Sections** **4**

- Importance, methods of representing, conventional sections of various materials, classification and sections, conventions.

6. **Pictorial and Isometric Views** **5**

- Isometric axis, oblique drawing axonometric views.
- Pectoral views from two or three views.
- Isometric view (introduction) and exercise.
- Conical projections.
- Tracing, blue printing and ammonia printing.

7. **Working Drawing/Details and Assembly** **5**

- Principle of detailed and assembly drawings.
- Detailed working drawing by actual measurement of a job already prepared.
- Practical exercise in drawing from detailed assembly and vice versa using actual job prepared in workshop.

8. **Rivets, Riveted Joints and Welded Joints** **5**

- Nuts and bolts, proportioning and views.
- Types of rivet heads, riveted joints, spigot and socket joints.
- Welded joints, IS welding symbols, butt joints, lap joints, corner joints, T-joints.

B. Workshop Technology **30**

- **Pipes and Pipe Fittings:** Classification of pipes according to their material and use. ISI specifications of pipes. Various types of pipe fittings and their application. Pipe Vice, Pipe threads and thread cutting. **9**
- **Metal Sawing:** Power Hack and Band Saw, their applications, specifications of blades used in above machines. **6**
- **Drilling:** Introduction, types of drills, portable and bench type drilling machines, drilling speed and feeds; Drill, Chucks and other accessories used in drilling machines. **7**
- **Soldering & Brazing:** General characteristics of soldering, brazing joints, processes and their characteristics. Brief description of soldering and brazing tools equipment. Types of solders and fluxes and their uses. Soldering defects and their remedies. Brazig materials. Advantages and disadvantages of soldering & brazing. **8**

PRACTICAL

Time: 2 Hours ***Marks: 30***

1. **Carpentary Shop:** Identification of wood, introduction of tools, safety precautions. Practical exercises involving practice of sawing, planning, chiselling, joining various joints. To make some utility jobs such as brackets,

office
tray. **7**

2. **Fitting Shop:** Introduction to tools and measuring instruments, their safe keeping, safety precautions, practical exercises involving sawing, filing, marking, squareness, chipping. **8**

   Description of work bench, work holding devices, care and maintenance of various tools used in fitting.

   Fitting Practice, checking by straight edge and tri square.

   Specifications of files, Precautions while filing.

   Jobs on Drilling and Tapping.

3. **Forging Shop**: Introduction and demonstration of tools, equipment and operations used in smithy and forging. **8**

   Upsetting operation, production of a blank for a bolt from a round bar.

   Exercise on drawing down operation.

   Exercise involving use of Power Hammer.

   Exercise in the making of D.E. Spanner/Hook.

4. **Sheet Metal Shop:** Description of tools and operations involved in Sheet metal fabrication such as shearing, bending, joining (locked groves joint, Riveting, soldering Brazing) Exercise like tray, Mug, Funnel etc. **7**

CLASS–XI
OPTIONAL
APPLIED MECHANICS (626)
THEORY

Time: 3 Hours ***Marks: 60***

1. **Introduction:** Concept and explanation of mechanics and applied mechanics, its importance and necessity giving suitable examples laws of motion. Explanation of branches of this subject, concept of rigid bodies. **6**

2. **Laws of Forces:** Force and its effect, units and measurement of force, characteristics of force, vector representation. Bows notation graphical method to find stressed in simple trusses.

   Types of forces-action and reaction, tension, thrust and shear force. Force action and reaction, tension, thrust and shear force. Force systems, Coplanar and space force systems. Coplanar concurrent and non-concurrent forces body diagram.

   Resultant and components of forces. Concept of equilibrium, Axioms in statics, parallelogram laws of forces. Equilibrium of two forces, superimposition and transmissibility of forces, triangle of forces, different cases of concurrent coplanar two force system, extension of parallelogram law and triangle law to many forces acting at one point, polygon law of forces, method of resolution into resolution into orthogonal components for finding the resultant, graphical methods, special case of three concurrent Coplanar forces Lami's theorem. **8**

3. **Moments:** Concept of moment, variants theorem (Statement only) Principle of moments – application of moments to simple mechanisms. Parallel forces like and unlike, calculation of their resultant. Concept of couple properties and effect. Moving a force parallel to its line of action. General cases of coplanar force system. General conditions of equilibrium of bodies under coplanar forces. **7**

4. **Friction:** Concept of friction, laws of friction, limiting friction and co-efficient of friction, sliding friction and rolling friction, angle of friction. **6**

5. **Concept of Gravity:** Concept of gravity, gravitational force, centroid and centre of gravity, centriod of regular lamina and centre of gravity of regular solids. Position of centre of gravity of compound bodies and centriod of composite centre of gravity of areas with portions removed. **7**

6. **Laws of Motion:** Concept of momentum. Newton's law of motion, their application derivation of force equation from second law of motion. Numerical problems on second law of motion. Piles, lifts, bodies tied with strings. Conservation of moments, impulse and impulsive force. **7**

7. **Work Power Energy:** Review of concept of the work power energy. Types of energy Conservation of energy. Horse power. Work done against gravity and work done against friction. **6**

8. **Circular Motion:** Circular motion, angular velocity and acceleration, relation between angular and rectilinear motion. Centrifugal and centripetal forces, uniform motion of a vehicle in a circular path. **6**

9. **Simple Machine:** Concept of machine, MA, VR, efficiency and their relationship. Reversibility of a machine and self locking law of machine. Simple machine, lever included plane, wheel and axle (simple and differential) Screw jack, Winch crabs pulleys fixed and moveable systems, certain differential pulley and work. **7**

PRACTICAL

Time: 2 Hours ***Marks: 40***

1. To verify the law of parallelogram of forces and triangle law of forces.
2. To verify the law of polygon of forces.
3. To verify the principle of moments.
4. To verify the coefficient of friction (M) between wood, steel, copper and glass (horizontal and inclined plane).
5. To find the mechanical advantage, velocity ratio, co-efficient of simple machine (wheel and axle Weston's differential pulley, screw jack)
6. To determine moment of inertia by flywheel.
7. To find the reaction at supports of beam, simply supported at the ends carrying concentrated load at one or more points.
8. To find out the forces in the jib and tie of a jib crane.
9. To establish law of a given machine.

CLASS–XI
GENERAL FOUNDATION COURSE (501)
(Common for Engineering & Technology Based Courses)

(Refer to page 7)

CLASS–XII
ELECTIVE
AUTO ENGINEERING (627)
THEORY

Time: 2.5 Hours+2.5 Hours ***Theory: 50***
Practical: 50

1. Service Equipment 10

- Construction, working and application of – air compressor, hydraulic hoist, car washer, oil dispenser, grease dispenser, tyre inflator, spark plug cleaner and tester, wheel balance (Dynamic), brake efficiency tester.
- Preventive, operative and breakdown maintenance schedules.

2. Automobile Lubrication and Cooling System 8

- Necessity of lubrication, different type of lubricants and their grades (SAE Number), type of lubrication system, function and working of different components (oil pump, oil filter) used in lubrication system, trouble shooting and remedies.
- Necessity of cooling system, different type of cooling system (water and oil cooling), their merits and demerits, function and working of different components (water pump, radiator, radiator pressure cap, thermostat valve etc.) used in cooling system, trouble shooting and remedies.

3. Final Drive System 6

- Function, type and working of universal joints, propeller shafts.
- Principle and working of differential, rear axle.

4. Front Axle and Steering 6

- Function, type and operational details of front axles and stub axles: Ackermann's principle of steering, toe-in, toe-out, castor, camber, king pin inclination (steering axis inclination), steering gear box (rack and pinion, worm and nut with re-circulating balls) and steering linkages, power steering, trouble shooting and remedies.

5. Frame and Suspension 6

- Frame and frameless construction, description of suspension system, leaf springs, coil springs and torsion bar. Function and working of different types of shock absorbers, trouble shooting and remedies.

6. Automobile Electrical System 7

- Battery (lead acid type) – construction, charging and discharging action, maintenance of batteries concept of maintenance free batteries, different circuit diagrams (Charging circuit, starting circuit, lighting circuit, horn circuit, wiper circuit), Wiring diagram of car, functions of various components used in electrical circuits of automobile. Function and working principle of dynamo alternator, self-starter and three GC unit regulators.
- Ignition system (battery ignition and magneto ignition), Spark plug – classification, ignition timing.

7. Motor Vehicle Act 1983 and Rules 7

- Provision regarding issue of driving licence, registration, insurance, transfer of ownership, fitness certificate, traffic signs, hand signals used by driver and traffic personnel.
- Emission, control, sources of emission/pollutants, Emission Norms in India.

Note: Practical will be based on aforesaid theory paper.

CLASS–XII
ELECTIVE
AUTO SHOP REPAIR & PRACTICE (628)
THEORY

Time: 2.5 Hours+2.5 Hours | *Theory: 50* | *Practical: 50*

1. Service Manual — 2

- Reading of service manual.

2. Inspection and Repairs of the Fasteners — 4

- Identification of fasteners used in a vehicle.
- Various procedure used for removal of fasteners from the unit.

3. Measuring Equipments — 10

- Handling and Use of dial gauge, telescopic gauge and bore gauge.
- Handling and Use of Vernier caliper and tyre depth gauge.
- Handling and Use of micrometer.
- Handling and Use of hydrometer and bevel gauge.
- Handling and Use of torque wrench and filler gauge.
- Usage of various gauges in a dashboard in vehicle.

4. Suspension System — 10

- Maintenance of suspension system.
- Service and replacement of leafs, cambering of leaf springs, shackle, shackle pin and centre bolt.
- Replacement of strut/shock absorbers, inspection of steering linkages.
- Manual and Power steering systems, Air suspension system.
- Steering system adjustments.

5. Serviceability, Replacement or Repair of Components — 10

- Reconditioning of valve mechanism.
- Inspection and replacement of piston rings.
- Inspection and replacement of connecting rod and engine bearing.
- Testing of cooling system and replacement of defective component.
- Regular servicing of MPFI system.
- Servicing of CRDI / Non-CRDI system.

6. Transmission System — 6

- Servicing of propeller/drive shaft, universal and slip joints.
- Servicing of differential unit and adjustments.
- Introduction to automatic transmission system.

7. Auto Electrical System 8

- Reading of electrical symbol, circuit diagrams, colour codes and specification of cables and wiring hardness.
- Multi meter, timing light (stroboscope) and oscilloscope and its application.
- Battery and its maintenance.
- Circuit diagram for battery charging.
- Checking of electrical connections and lights in a vehicle.
- Lighting system, application and replacement of fuses.
- Horn assembly, electrical fuel gauge and fuel pump their application and maintenance.
- Circuit diagram for starter circuit.
- Circuit diagram for ignition circuit.
- Servicing of wiper system.
- Introduction of HVAC System in a vehicle.

Note: Practical will be based on aforesaid theory paper.

CLASS–XII
OPTIONAL
ENGINEERING SCIENCE (622)
(Common for Automobile Technology and Airconditioning & Refrigeration Technology)

THEORY

Time: 3 Hours ***Marks: 70***

A. Engineering Drawing 40

(a) **Section of Solids:** Concepts of sectioning. Projection of sections of poly-Hedron including their true shapes. **9**

(b) **Development of Surfaces:** Development of Poly-Hedron and solids of revolution including their sections. **8**

(c) **Fasteners:** Introduction of temporary and permanent fasteners, riveted joints and welded joints. Types of screw threads, conventional symbols for Internal and External threads, ISI specifications. Drawing of Bolts, Nuts, studs and locking devices. Their application in Engineering field. **9**

(d) **Keys and Cotters:** Different types of keys, sleeve and cotter joints, socket and spigot joints, knuckle joints. **7**

(e) **Couplings:** Solid and split coupling, flanged coupling, simple and protected. **7**

B. Workshop Technology 30

(a) **Welding:** General characteristics of welded joints, Principle of welding, Types of welding processes and their brief description e.g. gas welding and arc welding, high pressure gas welding and low pressure gas welding. DC welding and AC welding, brief description of resistance welding, spot welding, butt welding, seam welding, submerged arc welding, thermit welding, inert gas welding, tungsten inert gas welding, mig. atomic hydrogen welding.

Gas welding and AC welding tools and equipments, selection of electrodes, fluxes, currents, torches and equipments. Specifications of tools, equipment and materials according to BSI. Different types of flames and their application in welding, Defects in welding and their detection. **15**

(b) **Metallic and Non-Metallic Coatings:** Necessity of metallic and non-metallic coatings. Principle and processes of electroplating and galvanising, their applications. Properties and uses of varnishes, paints including primers and enamels. **6**

(c) **Plastics Technology:** Introduction to thermoplastic and thermo-setting plastics, general properties, injection moulding, compression moulding-process and equipment, other plastic moulding methods, Machining plastics. **9**

PRACTICAL

Time: 2 Hours ***Marks: 30***

1. **Welding Shop:** Are welding-introduction to tools and equipments, safety precautions, use of welding transformer/ welding machine, method of selecting current, choice of electrode. Exercise involving surface and edge preparation, making of simple welding joints.

   Gas Welding: Introduction to gas welding equipment, safety precautions, selection of gas pressure, welding toruch type of flame, flux, welding rod and welding technique. Exercise involving job preparation and making Single Joints, Brazing practice of brazing by gas.

2. **Machine Shop:** Introduction to various types of Drilling machine (portable Drilling Machine, Pillar type, Bench type, Radial drilling machine).

   Simple Exercises involving the use of above machines.

   Introduction to Lathe (Job mounting, Tool holding Devices).

   Simple exercises on Lathe (Turning, Facing, Parting, Step Turning, Chamfering, Knurling, Groove cutting by Form tool).

3. **Painting and Polishing:** Introduction to paints and allied materials, exercises on surface, preparation, varnishing, spirit polishing painting-using brush and spray, casual painting.

List of Experiments

Machine Shop

1. Drilling at specified position using a bench drilling machine.
2. Drilling holes upto 40 mm diameter, using a radial drilling machine.
3. Use of pillar type drilling machine for drilling hole upto 25 mm diameter.
4. Mountaning a job on a lathe machine in the four jaw chuck.
5. Setting of various types of cutting tools in tool post of a lathe machine.
6. Facing, centering, plain turning and chamfering on a lathe machine.
7. Step Turning and parting of job on a lathe machine.
8. Knurling and growing of job on a lathe machine with the help of forming tool.

Welding Shop

A. Arc Welding

1. Introduction of tools and welding transformer for electric arc welding.
2. Safety precautions of arc welding.
3. Introduction to various types of electrodes for arc welding and selection of current.
4. Edge preparation and making a Butt-joint.
5. Making a lap joint with the help of arc welding.
6. Making a T-Joint with the help of arc welding.
7. Making a corner-joint with the help of arc welding.

B. Gas Welding

1. Demonstration of gas welding equipment including.
   (i) Selection of gas pressure welding torches.
   (ii) Various types of welding rods, flames and fluxes.
2. Safety precautions in gas welding.
3. Edge preparation and making Butt joint with help of ages welding.
4. Making a lap-joint with the help of gas welding.
5. Making a T-joint with the help of gas welding.
6. Making a Corner-joint with the help of gas welding.
7. Brazing practice with the help of welding-toruch.

Painting and Polishing Practices

1. Filling or putty application.
2. Staining.
3. Sand preparing.
4. Varnish Polishing.
5. Spirit Polishing.
6. Brush Painting.
7. Spray Painting.

Note: Each student should perform all the experiments and Practices during the session.

List of Experiments

1. To test safety and operating controls such as Relay, Thermostat, L.P. cut-out, H.P. cut-out, Over-load protector, solenoid valve, oil pressure, Failure Control etc.
2. To carry out electric wiring of Refrigerator and Bottle Cooler.
3. To carry out electric wiring of window type Air Conditioner.
4. To test compressor for efficiency and earthing etc.
5. To service a window type Air Conditioner.
6. To find fault in Refrigerator and Bottle cooler.
7. To find fault in Air Conditioner.
8. To Check Comfort Conditions such as air, temperature, humidity, Air Motion etc.
9. To adjust the Automatic System.
10. To study compressor capacity control methods.

Note: Each student should perform all the experiments during the session.

CLASS–XII
OPTIONAL
MECHANICAL ENGINEERING (626)
THEORY

Time: 3 Hours ***Marks: 60***

1. **Transmission of Power:** Uses of belts and ropes (without including their materials), pulleys different types of pulleys. Chain drive, its comparison with belt drive. Gear drive, types of gears, simple gear trains and velocity ratio. Description of single plate disc. clutch. **12**

2. **Steam Biolers:** Coch boiler, Lancashire boiler, Bibcock and Wilcox boiler, Baby Vertical boiler, their mountings and accessories. **12**

3. **Turbines:** Classification and application of turbines. Elementary study of different types of turbines-construction and working of D' Level and Parson's turbine, pelton wheel, Francis and Kaplan turbine. **12**

4. **I.C. Engines and Compressors:** Classification and application of I.C. engines commonly used, spark ignition and compression ignition engines, working principles of two stroke and four stroke Petrol and Diesel engines Ignition engines, working principles of two stroke and four stroke Petrol and Diesel engines. Ignition systems in Petrol engines. Construction and working of a simple reciprocating compressors. **12**

5. **Material Handling:** Brief treatment of bulldozer, shovel, road roller, concrete mixer, crane, travelling gantry crane, screw Jack, hydraulic Jack. **12**

PRACTICAL

Time: 2 Hours ***Marks: 40***

1. To study various devices for transmission of power, models of belts, pulleys, gears and chains.
2. To study baby vertical boiler with the help of model.
3. To study Lancashire boiler with the help of model.
4. To study Bibcock and Wilcox boiler with the help of model.
5. To study simple steam turbine with the help of model.
6. To study 4 stroke petrol and diesel engines with the help of model.
7. To study 2 stroke petrol engine with the help of model.
8. To study ignition system of petrol engine.
9. To study cooling system of IC engine.
10. To study simple reciprocating air compressor.
11. To study Hydraulic Jack and screw-Jack.

Guidelines for Examiners

(Common for Practical Paper II & III)

Examiner will evaluate the candidate as per the following guidelines:

1. Systematic approach to the problem.
2. Dismantling, assembling and replacing of components etc.
3. Safety precautions.
4. Initiative taken by individual candidate.
5. Proper use of tools.
6. Special consideration be given for skill, workmanship and finish.
7. Records of on-job-training.

Note: Each student may be allotted two experiments from the list and he/she may perform any one out of the two.

General Instructions to the Students/Candidates

(Common for Practical Paper II & III)

1. It is essential for each student to complete every Practical himself and not merely watch others doing it.

2. The student should make simple line diagram of the assembly components/circuit and note the provisions for important points adjustments therein.
3. After completing the practical exercise, he must write in his Practical note book using the following heading:
   - Title to include objective of Practical exercise.
   - Tools-Equipments and Materials used (if possible, with specifications).
   - Procedure of performing the Practical including any special precautions to be taken during Dismantling or Reassembling.
   - Examination of Parts, noting methods of adjustments and recording reason for service ability of amount of wear.
   - Conclusion: A report on the general condition of the assembly components including a list of new parts fitted/replaced or recommendation to make the component fit for further service.
   - Safety precautions to be taken while performing the Practicals.
4. In case of any difficulty while performing the Practicals, the Examinee must approach his teacher without hesitation.

CLASS–XII
GENERAL FOUNDATION COURSE (501)
(Common for Engineering & Technology Based Courses)

(Refer to page 13)

LIST OF RECOMMENDED BOOKS

S. No.	Title of Book	Authors Name	Publishers/Address
1.	Automobile transmission servicing and overhaul	Staton Abbey	London Pitman Publisher
2.	Practical Automobile Engg.	Staton Abbey	Bombay Asia Publishing House
3.	Automotive Mechanics.	W.H. Crouse	Tata McGraw Hill Publishing Cotte
4.	Automotive tune up	Crouse & Anglin	Tata McGraw Hill Publishing Cotte
5.	Automotive Engg.	G.B.S. Narang	Khanna Publishers
6.	Automotive Engine Repair	Ivan D. Hinerman	Glancee Publishing Co.
7.	Automotive Chasis & Body	P.L. Kohli	–
8.	I.C. Engine	Keswani	–
9.	Automotive Fuel Lubricating & Cooling System	W.H. Crouse	Tata McGraw Hill
10.	Motor Vehicle Tech. and Practical Work (Vol. I and II)	J.D. Dolan	Heinemann Educational Book Ltd., London
11.	Industrial Management	O.P. Khurana	–

12.	Industrial Management	K.K. Ahuja	–
13.	Automotive Engineering	R.K. Rajput	–
14.	Automobile Engineering	Domkundwar	–

LIST OF EQUIPMENTS FOR AUTOMOBILE TECHNOLOGY

A Lab. / Workshop must be set up with following tools, machines and equipments

Measuring & Marking Tools

1. Vernier Calliper (metric system).
2. Micrometer:
   - External – Ranges: 0 – 25 mm, 25 – 50 mm, 50 – 75 mm.
   - Internal
3. Dial gauge (metric system) with magnetic stand, telescopic gauge, bore gauge.
4. Feeler Gauge.
5. Straight Edge.
6. Dividers: Inside & Outside.
7. Torque Wrench.
8. Voltmeter, Multimeter.
9. Hydrometer.
10. Timing Light (stroboscope).
11. Depth gauge, bevel gauge.
12. Various fasteners used in automobile.
13. Electrical fuel gauge.

General Purpose Tools

1. Fix Spanner (Double ended)

   Sizes: 6 X 7mm, 8 X 9mm, 10 X 11mm, 12 X 13mm, 14 X 15mm, 16 X 17mm, 18 X 19mm, 20 X 22mm.
2. Ring Spanner (Double Ended)

   Sizes: 6 X 7mm, 8 X 9mm, 10 X 11mm, 12 X 13mm, 14 X 15 mm, 16 X 17 mm, 18 X 19 mm, 20 X 22 mm.
3. Socket Spanner set with following items:
   - 20 Sockets (sizes 6mm onward).
   - T – handle.
   - 4 inch extension rod.
   - 8 inch extension rod.
   - Ratchet handle.
   - Rotating union (Angular Joint).
4. Pliers:
   - Side Cutting Pliers.

- Round nose Pliers.
- Flat nose Pliers.

5. Hammer – Ball Pane, Cross Pane, Hide Face.
6. Screw Drivers: Straight Tip – 8 inch & 12 inch.
   Philips – 8 inch & 12 inch.
7. Hacksaw Frame with blades.
8. Chisel – 6 inch (Flat).
9. Allen key – 4mm. to 14mm.
10. Oil Cane.
11. Files: Bustard, Rough, Smooth and Rasp cut.
12. Emery Papers / Cloth.

Equipments (For Demonstration)

- Old Chassis frame (Jeep or any heavy vehicle & Car Chassis).
- Old engine / Cut model of any engine.
- Live axle assy. With differential & Final drive / Cut model of same.
- Dead axle assy. with Stub axle.
- Components of Suspension System (at least each one).
- Cut model of shock absorber.
- Components of steering System (at least each one).
- Components of Brake System (at least each one).
  - Mechanical brake assembly.
  - Hydraulic brake assembly.
  - Air brake assembly.
- Components of Automobile Electrical System (at least each one).
- Different coloured automobile cables.
- Cooling System Components: Radiator, Water pump, Cooling Fan, V – belt, Thermostat valve and Hoses.
- Lubrication System Components: Strainer, Oil pump, PRV, etc.
- Compressor (in working condition).
- Gearbox (old) and clutch assembly.

SUGGESTIVE LIST OF MODELS/CHARTS

S. No.	Name of Instrument	Qty. Reqd.
1.	A.C. Fuel pump.	1
2.	Carburettor- solex, cartor.	1
3.	Epicylic gear box.	1
4.	Engine 4 stroke - 2 strokes (Both petrol and diesel).	2 each

5.	Electrical fuel pump.	1
6.	Electric Horn.	1
7.	FIP Model.	1
8.	G/box sliding, constant and synchrometer.	1
9.	Hydraulic Braking system.	1
10.	Oil Pump.	1
11.	Radiator.	1
12.	Steering Assembly.	1
13.	Torque convertor (optional).	1

Other Points to be Implemented

- As far as possible the teacher must demonstrate the parts or equipments simultaneously with the lecture.
- Safety precautions must be properly observed by the students while doing practical work in the workshop (safety first rules also must be taught by the teacher).

CIVIL ENGINEERING

Introduction

In our country more than sixty percent of plan budget goes to construction activities/industry, directly or indirectly. According to the latest information available in various five year plans much of the country's development work, especially in rural and suburban areas, is still pending, awaiting urgent attention. As per the plan document, millions of shelters are required to be constructed, many villages remain in the category of 'No Source' and most of them 'partially covered' villages having safe drinking water supply level less than 40 liters per capital per day. It has also been experienced that we construct good building but in the course of time, they require continuous repair and maintenance. A realization is thus growing and picking up moments, particularly in urban sector for keeping the building and other structures in perfect condition. These and many more potential exist where Civil Engineering vocational students can get wage/self employment.

There is considerable scope of employment of Civil Engineering vocational students in service sector like repair and maintenance of buildings and building services. Marketing of new building material is another potential area of employment. Civil Engineering vocational students should get the exposure of required knowledge and associated skills in the above areas and entrepreneurial support system should provide soft loans and guidance to such students.

There is a need to establish networking with selected number of field organizations for effective implementation of this vocational course in Civil Engineering.

In the times to come, wage employment, particularly in the government sector is likely to dwindle. Civil Engineering vocational students will have to provide guidance and career counselling to the entrants, schools will have to provide guidance and career counselling to the entrants, for promoting undertaking self-employment ventures like sub contractor ship, undertaking repair and maintenance services and installation of sanitary and water supply systems etc. In addition, students need to be counselled for opting their career in technical education, such as Polytechnic and engineering colleges etc.

Thus major employment of vocational students in Civil Engineering is envisaged in the following construction organizations/departments.

1. Construction Industry in Private Sector.
2. Self employed as Civil Engineering Contractor.
3. State and Central Public Works Departments and other Government undertakings (need based employment).

COMPETENCY PROFILE OF VOCATIONAL STUDENTS IN CIVIL ENGINEERING

Based on employment opportunities and activity profile of vocational students in civil engineering, following competency profile is arrived at:

1. Skill in preparing, reading and interpreting drawing pertaining to civil engineering and allied works.
2. Knowledge of various types of construction materials and their characteristics.
3. Knowledge of various construction techniques and ability to supervise various civil works such as buildings, industrial structures etc.
4. Understanding of concepts, principles and practices in making concrete and concreting operations for different types of civil works.
5. Knowledge of the principles and methods of surveying and skills in conducting surveys.
6. Knowledge of behaviour of various types of soils and their use for civil works.

7. Knowledge in the analysis and design of simple structural elements.
8. Competencies in estimating and costing.
9. Skill in managing construction materials.
10. Ability to develop scientific temper and facilitate understanding of technical subjects.
11. Knowledge of interpersonal relations and skills in communication.
12. Knowledge of appropriate attitude and values.
13. Skill in using computers in the field of civil engineering.

CLASS–XI
ELECTIVE
ELEMENTS OF CIVIL ENGINEERING (797)
THEORY

Time: 2.5 Hours ***Marks: 50***

Unit–1: Construction Tools — 10

- Introduction and necessity of tools in construction, Types of tool.
- Hand Tools.
- Power Tools.
- Site Machinery.

Unit–2: Construction Materials — 15

- Basic Structure Material.

  Bricks/Blocks/Stone/Rubble, Sand, Cement, Lime, Aggregate, Steel Bars and Binding wires, Timber, Water.
- Basic supporting Material.

  Admixtures (In Cement, Concrete etc.), Protective Coatings, Bitumen (Type &its uses), Sealing Compounds, Grouting Compounds.
- Basic Finish Material.

  Type of Tiles (Floor, Roof, Cladding & special purpose), Plaster of Paris, Paints (External & Internal), Aluminium Glazing, Doors & Windows, Glass, Sanitary Fittings, Indoor & external paints.

Unit–3: Construction Plants and Equipment — 10

- Static Plant & Equipment.
- Tower Cranes.
- Batching Plants.
- Concert pumps.
- Mobile Plant & Equipment.
- Road Rollers.
- Pavers.

Unit–4: Material Testing — 10

- Lab Testing.
- Test of Cement, Brick, Tiles, Water, Aggregate, Bitumen.

Unit–5: Safety and Precautions in Construction **5**

- Personal Safety.
- Equipment Safety.
- Dos & Don'ts at Site.

PRACTICAL

Time: 2.5 Hours ***Marks: 50***

1. Identification & Uses of Hand Tools.
2. Identification & Uses of Power Tools.
3. Identification of Various Types of Steel.
4. Identification of Various Types of Timber.
5. Identification of Various Types of Glass.
6. Identification of Various Type of Aluminium Section.
7. Cutting of Plywood & Timber pieces.
8. Making Timber Surface Plane.
9. Making of Plywood & Timber Joints.
10. Silt Test for sand.
11. Test of Cement.
12. Test of Water.
13. Test of Brick.
14. Test of Tiles.
15. Test of Aggregate.
16. Test of Bitumen.
17. Thickness Measurement of Materials Using Gauges.

PRACTICAL GUIDELINES

Parameters	Marks
Project / Practical Activities.	10
Viva Based on Project.	10
Practical File / Report or Portfolio.	10
Demonstration of skill Competency in Lab Activities.	20
Total	**50**

CLASS–XI
ELECTIVE
CAD IN ENGINEERING (798)

THEORY

Time: 2.5 Hours *Marks: 50*

Unit–1: Introduction to Computers **10**

- Computer and its types.
- Block diagram of a computer & over view of its working,
- Overview of software and hardware in computer, Input/output devices - interconnections of various peripherals with Computer, Auxiliary storage device.
- Application Vs System software.
- Operating System, Brief introduction to DOS, Bios and MS Windows, Linux, Booting the system.
- Free and Open Source Software.
- Basics of printing, scanning, faxing devices used in industries.
- Web technologies/Introduction and Application to Internet, Search engines, E-mailing.

Unit–2: Familiarization with Microsoft Office tools **5**

- MS Office Word.
- MS Office Excel.
- MS Office PowerPoint.
- MS Office Access.

Unit–3: Introductions to Engineering Drawing **10**

- Drawing instruments & their uses.
- Layout of drawing sheet, Lines, Lettering, Dimensioning.
- Types of scales, plain scale, diagonal scale.
- Dimensioning of Drawing.
- Conventional Representation and symbols.

Unit–4: Projections and Isometric Views **15**

- Principles of projections, methods of projections, orthographic projections, planes of projections, first angle projection, third angle projection, difference between first and third angle projection.
- Simple examples of Projections of point, lines and planes.
- Fundamentals of isometric projections, Isometric views from 2 or 3 given orthographic views.
- Isometric Drawings of Plane Geometrical Figures.

Unit–5: Introduction to CAD **10**

- Fundamental of CAD, Advantages of CAD.
- Geometric Shapes.
- Introduction to AUTOCAD, Basic commands used, Exercises on basic figures.
- Isometric drawing, basic dimensioning, Simple Exercises using basic AutoCAD commands.
- Introduction to Software used in civil engineering and their applications (Names of software and applications only).

PRACTICAL

Time: 2.5 Hours *Marks: 50*

1.	Scanning a picture and to prepare a jpg file	**3**
2.	Collection of some relevant information on current topic with the help of search engines.	**4**
3.	Practice of composing and sending an e-mail.	**2**
4.	Preparation of documents through MS Word	**4**
5.	Practice of inserting commands in MS-Word.	**2**
6.	Preparation of a spread sheet through MS excels.	**4**
7.	Preparation of bar chart/graph/pie-chart through MS excel.	**4**
8.	Preparation of power point presentation on any current topic consisting of minimum 5 slides.	**3**
9.	Preparation of database of class marks of various subjects by MS Access.	**4**
10.	Preparation of drawing sheet for Lettering/Scales.	**3**
11.	Preparation of drawing sheet for various types of lines used in engineering drawings.	**3**
12.	Preparation of drawing sheet for orthographic projections in 1st angle.	**2**
13.	Preparation of drawing sheet for orthographic projections in 3rd angle.	**2**
14.	Preparation of drawing sheet for isometric projections of simple objects.	**2**
15.	Drawing and dimensioning of various Geometrical features using AutoCAD.	**4**
16.	Simple Views.	**2**
17.	Isometric Views.	**2**

CLASS–XI
OPTIONAL
ENGINEERING MECHANICS (799)
THEORY

Time: 2.5 Hours ***Marks: 50***

Unit–1: Introduction **8**

- Concept of mechanics and applied mechanics - Explanation of mechanics and applied Mechanics, its importance and necessity, Rigid body.

Unit–2: Laws of Forces **8**

- Force and its effects, Units and measurements of force. Types of forces, action and reaction, Force systems: Coplanar and space force systems, Coplanar, concurrent and non-concurrent forces. Free body diagrams. Resultant and components of forces; parallelogram law of forces, triangle law of forces, polygon law of forces, Lami's theorem.

Unit–3: Moments **5**

- Concept of moment, Varignon's theorem - statement only, Principle of moments-Parallel forces, like and unlike parallel forces, concept of couple, properties of couple.

Unit–4: Friction **8**

- Concept of friction, laws of friction, limiting friction and coefficient of frictions, sliding friction and rolling frictions.

Unit–5: Centre of Gravity **5**

- Centriod and centre of gravity. Centroid for regular lamina, centriod of composite figures.

Unit–6: Moment of Inertia of Plane Areas **8**

- Concept of Moment of Inertia and second moment of area and Radius of gyration, theorems of parallel axes, second moment of area of common geometrical sections: rectangle, triangle, circle (without derivations). Second moment of area for I., T. and I sections.

Unit–7: Laws of Motion 8

- Concept of momentum, Newton's laws of motion, their application, derivation of force equation from second law of motion, numerical problems on second law of motion. Newton's third law of motion.

PRACTICAL

Time: 2.5 Hours ***Marks: 50***

1.	Verification of the laws of polygon of forces.	**5**
2.	To verify the forces in the different members of a jib crane.	**5**
3.	To verify the reaction at the supports of a simply supported beam.	**5**
4.	To verify the principal of moment using bell crank lever.	**5**
5.	To find out the coefficient of friction between two surfaces (wood and glass) in contact by using horizontal plane.	**5**
6.	To find the mechanical advantage, velocity ratio and efficiency in the case of Screw Jack.	**5**
7.	To find the mechanical advantage, velocity ratio and efficiency in the case of worm and worm wheel.	**5**
8.	To find the mechanical advantage, velocity ratio and efficiency of a single purchase crab.	**5**
9.	To determine the personal horse power by using manual horse power apparatus.	**5**
10.	Determination of mechanical advantage, velocity ratio and efficiency of wheel and differential axle.	**5**

CLASS–XI
GENERAL FOUNDATION COURSE (501)
(Common for Engineering & Technology Based Courses)

(Refer to page 7)

CLASS–XII
ELECTIVE
CONSTRUCTION TECHNOLOGY (797)
THEORY

Time: 2.5 Hours ***Marks: 50***

1. Building Construction 10

- Site Selection for construction, various components of a building (sub structure and super structure with elaboration of technical terms).
- Foundations: Need and function of foundation, different types of foundations and their uses.
- Masonry: General principles of bricks masonry, types of bonds.
- Floors: Types of flooring and their uses.
- Stairs: Need and types of stairs.
- Doors and Windows, Purpose of each and their classification.

2. Concrete Technology 10

- Definition of concrete, different types of concrete and their uses, Ingredients of Concrete.
- Preparation of concrete:

  Batching, Mixing, Transportation, Placement, Compaction, Curing, Finishing.
- Properties of Concrete:

  Properties in plastic stage: workability, segregation, bleeding.
- Properties of hardened concrete: strength, durability.
- Introduction to standard concrete mixes.

3. Formwork, Scaffolding and Steel Fixing **10**

- Introduction and purpose of formwork.
- Timber joints, cutting and drilling of plywood.
- Shuttering for beam, column and slab floor.
- Codal provisions on formwork.
- Introduction and purpose of scaffolding, Component parts, Types of scaffolding.
- Types of ties and their uses.
- Making and placing reinforcement for slab & foundation.
- Codal provision on steel fixing.

4. Services & Utilities **10**

- Introduction to plumbing, plumbing tools and their uses.
- Water distribution system, material for service pipes, service connection, valves.
- Aim and principles of house drainage, Pipes and traps.
- Sanitary fittings.
- House wiring: Types of wires used, tools used for house wiring, Circuit diagram for tube light, bulb, fan and switches & sockets.
- Fire protection: Fire hazards, characteristics of fire resisting materials, general fire safety requirements for buildings, fire alarms, fire extinguishing equipment.

5. Construction Work Supervision **10**

- Roles and responsibilities of construction work supervisor.
- Record keeping: Muster roll, measurement book, register for material receipt and issue, logbook for construction equipment.
- Site Registers: site diary, site order book, inspection register, cement register, steel register, register for approval of other materials, material requisition and issue records.
- Register for scrap material, POL records, register for construction equipment.
- Check list (Dos and Don'ts) for construction work supervision.

PRACTICAL

Time: 2.5 Hours ***Marks: 50***

1. Laying of bricks in different layer using English bond. **5**
2. Laying of bricks in different layer using Flemish bond. **5**
3. To determine workability of concrete by slump test. **5**
4. Test for compressive strength of concrete cubes. **5**

5.	To make T-joint and dove tail joint in timber.	**5**
6.	Cutting of plywood in different patterns.	**5**
7.	Drilling in plywood.	**5**
8.	T- joint in service pipes.	**5**
9.	Wiring from MCB to switch board having a three pin socket, switches for fan and tube light.	**5**
10.	Making entries in the measurement book for small piece of construction work.	**5**

CLASS–XII
ELECTIVE
ESTIMATION IN CIVIL ENGINEERING (798)
THEORY

Time: 2.5 Hours ***Marks: 50***

1. Introduction to Surveying — 10

- Principal of Surveying.
- Purpose of Surveying.
- Surveying Equipment and Accessories.
- Contouring.
- Scale of Map.
- Errors in Surveying.

2. Types of Surveying — 15

(a) **Physical Surveying**

- Chain Surveying.
- Compass Surveying.
- Plane Table Surveying.
- Levelling.

(b) **Equipment Surveying**

- Dumpy Level.
- Theodolite.
- Total Station.

3. Estimation — 15

- Definition & Necessity of Estimation.
- Types of Estimates (including technical terms).
- Units of Measurements.
- Items of Works & Specifications.
- Methods of Measurements.
- Preparation of Detailed Estimate (Simple 1 & 2 room with foundation).
- Abstract of Cost & Bill of Quantity (BOQ).

4. Analysis of Rates — 10

- Introduction & Purpose.
- Method of Analysis of Rates.
- Analysis of Rates of Common Items of Works:
  - (a) Earth Work.
  - (b) Brick Masonry.
  - (c) RCC.

PRACTICAL

Time: 2.5 Hours ***Marks: 50***

1.	Identification of Surveying Equipment and Accessories.	**5**
2.	Chaining and Ranging.	**5**
3.	Compass surveying.	**5**
4.	Plane Table surveying.	**5**
5.	Demonstration of instruments for survey equipment at site. - Auto level/ Theodolite/ Total station.	**5**
6.	Preparation of Estimate of Boundary wall.	**5**
7.	Preparation of Estimate of 1 Room.	**5**
8.	Preparation of Estimate of 2 Room.	**5**
9.	Calculate area and volumes of various geometric figures.	**5**
10.	Exercise on Analysis of Rates of Common Items of Works: (a) Earth Work. (b) Brick Masonry. (c) RCC.	**5**

CLASS–XII
OPTIONAL
ELEMENTARY STRUCTURAL MECHANICS (799)
THEORY

Time: 2.5 Hours ***Marks: 50***

Rationale

This is basic engineering subject. The purpose of the subject is to impart basic knowledge and skill regarding properties of materials, concept of stresses and strains, bending moment and shear force diagrams, second moment of area, bending and shear stresses, slope and deflection and analysis of trusses. The above knowledge will be useful analysis and design of structural components. This subject is very important to develop basic concept and principles related to structural engineering. This subject will also enable the students to continue their further education. **This subject is complimentary to Engineering Mechanics (optional-1 of class 11th). Students are advised to opt for this optional subject in class 12th after studying Engineering Mechanics as optional in class 11th.**

Note: Weightage of each topic for external examination is given in the brackets.

DETAILED CONTENTS

1. Properties of Materials **5**

- Classification of materials, elastic materials, plastic materials, ductile materials, brittle materials.

- Tensile test, compressive test, impact test, fatigue test, torsion test.

2. Simple Stresses and Strains — 10

- Concept of stress, normal and shear stresses, stresses due to torsion.
- Concept of strain, strain and deformation, longitudinal and transverse strain, poison's ratio, volumetric strain.
- Hook's Law, modulus of elasticity and rigidity, Bulk modulus of elasticity, relationship between the elastic constants.
- Stresses and strains in bars subjected to tension and compression. Extension of uniform bar under its own weight, stress produced in compound bars (two or three) due to axial load.
- Stress-Strain diagram for mild steel, mechanical properties, factor of safety.
- Temperature stresses and strains.

3. Bending Moment and Shear Force — 5

- Concept of a beam and supports (Hinges, Roller and Fixed), types of beam: simply supported, cantilever, fixed and continuous beam.
- Types of loads (point, uniformly distributed and varying loads).
- Concept of bending moment and shear force, sign conventions.
- Bending Moment and shear force diagrams for cantilever, simply supported subjected to concentrate, uniformly distributed load (simple numerical may be given).

4. Bending and Shear Stresses — 5

- Theory of simple bending with assumptions.
- Application of the equation M/I = F/Y = E/R (No derivation).
- Moment of resistance, sectional modulus and permissible bending stresses in (c5*) circular, rectangular, I, T, and L sections; Concept of shear stresses in beam, shear stress distribution in rectangular, I, and T section (Formula to be stated, no derivation), (simple numerical may be given).

5. Columns — 10

- Theory of columns, Euler's critical load, empirical design formulae, Rankin's, formulae.

6. Combined Direct and Bending Stresses — 5

- Concentric and eccentric loads, eccentricity.
- Effect of eccentric load on the section, stresses due to eccentric loads, examples in the case of short columns.

7. Analysis of Trusses — 10

- Concept of a frame, redundant and deficient frame, and supports.
- Analysis of determinate trusses by
  - (i) Method of joints.
  - (ii) Methods of sections.

PRACTICAL

Time: 2.5 Hours — ***Marks: 50***

1. Verification of forces in framed structure. **5**
2. Tensile test on bars of Mild steel/Aluminium with universal testing machine. **5**

3. Double shear test on specimen of two different metal wires. **5**
4. Bending tests on a simply supported steel bar or a wooden beam and calculatee young modules of elasticity. **5**
5. Impact test on metals Izod test/ Charpy test. **5**
6. Torsion test on specimens of different metals for determining the angle of twist for a given torque. **5**
7. To determine the stiffness of a helical spring and to plot a graph between load and extension. **5**
8. Hardness test on metal and finding the Brinel and Rockwell hardness. **5**
9. Determination of Young's modulus of elasticity for steel wire with Searl's apparatus. **5**
10. Determination of modulus of rupture of a timber beam. **5**

CLASS–XII

GENERAL FOUNDATION COURSE (501)

(Common for Engineering & Technology Based Courses)

(Refer to page 13)

LIST OF RECOMMENDED BOOKS

S. No.	Title of Book	Publisher by	Author
1.	Engg. Drawing Geometrical and Mechanical Drawing	Charotar (Gujarat)	N.D. Bhatt
2.	Engg. Materials	Vikas	Surender Singh
3.	Materials of Construction	-do-	Ghosh
4.	Engg. Drawing	-do-	Kapur
5.	Introduction to Engg. Materials	-do-	Aggarwal
6.	Material Science & Processes	Dhanpat Rai	Jha
7.	Workshop	S. Chand	G.K. Gupta

LIST OF TOOLS/EQUIPMENTS

1. Work Benches. 4 Nos.
2. Bench Vices 100 mm. 3 Nos.
3. Tools kit which include different types and sizes of files, try square, steel rules, hack-saw frame, hammer centre punches, chisels etc. 4 Sets
4. Surface plates. 2 Nos.
5. Anvil with stand, 50 kgs. 1 Nos.
6. Vernier Calliper. 2 No.
7. Micrometer 0-25 mm. 2 Nos.
8. Gauge . 2 No
9. Dial Gauge set. 2 Nos.
10. Combination set. 2 Nos.
11. Thread Gauge. 2 Nos.
12. Feeler Gauge. 2 Nos.
13. Drilling Machine 12 mm (Pedestal type) with Drill Chuck and key. 1 No.

14. Drills of different sizes. 1 Set

15. Vernier Micrometer.

16. Material required for conducting curriculum experiments.

AIR CONDITIONING AND REFRIGERATION TECHNOLOGY

Course Objectives

After successfully completing the two year of Senior Secondary Vocational Course the student would have acquired relevant appropriate and adequate technical knowledge together with the professional skills and competencies in the field of Airconditioning and Refrigeration Technology so that he/she is properly equipped to take up gainful employment in this vocation.

Thus he should have acquired

A. Understanding of

(a) The relevant basic concepts and principles in basic science subjects (Physics, Chemistry and Mathematics) so that he/she is able to understand the different vocational subjects.

(b) The basic concepts in engineering drawing.

(c) The concepts and principles of working of refrigeration and airconditioning equipment.

(d) The knowledge of testing, faults, identification and repair procedures in respect of refrigeration and air conditioning equipment.

(e) The knowledge to prepare estimates for cost of repair/installation/maintenance/ overhauling jobs.

B. Adequate Professional Skills and Competencies in

(a) testing, fault location and repairing of refrigeration and airconditioning equipment.

(b) Installing and commissioning of refrigeration and airconditioning equipment.

(c) Carrying out preventive maintenance of refrigeration and airconditioning equipment.

(d) dismantling, overhauling and reassembling of refrigeration and airconditioning equipment.

C. A healthy and Professional Attitudes of that He/She has

(a) An analytical approach while working on a refrigeration or airconditioning equipment.

(b) An open mind while locating/rectifying faults in a refrigeration or airconditioning equipment.

(c) Respect for working with his/her own hands.

(d) Respect for honesty, punctuality and truthfulness.

CLASS–XI
ELECTIVE
AIR CONDITIONING AND REFRIGERATION–I (632)
THEORY

Time: 2 Hours *Marks: 40*

1. **Introduction**

   Meaning of Air Conditioning and Refrigeration, Brief history of Air Conditioning and Refrigeration, Application of Refrigeration, Concept of System, its boundary, and surroundings, Principles and processes involved in production of low temperatures expansion of a liquid with flashing, reversible adiabatic expansion of a gas, irreversible adiabatic expansion (throttling) of a real gas, thermo electric cooling, adiabatic demagnetization, Unit of Refrigeration, Energy Balance of a Refrigeration machine–heat energy absorbed from the system, heat rejected to surroundings, and work done, Carnot cycle, and Reverse Carnot Cycle, Coefficient of Performance, Comparison of heat engine, heat pump and refrigeration machine. Comparison of heat pump and electric resistance heater. Rating of Refrigeration Machines. **13**

2. Refrigeration System, Air Refrigeration cycle, applications, and its limitations, Vapour Compression Cycle, Representation of Vapour Compression Cycle on temperature– entropy and pressure– enthalpy diagram, Effect of sub-cooling, Super heating, change in suction pressure and discharge pressure on coefficient of performance, Deviation of actual cycle from the theoretical cycle, Simple mathematical circulation with pressure, enthalpy charts, Energy Balance of basic refrigeration system. **12**

3. Working of a Mechanical Refrigerator, Water Cooler etc., Refrigeration tools and materials, tubing, cutting, bending, flaring, joining, tube, fittings, instruments and gauges, drills, taps, dies, valves, gaskets, refrigerants, cylinders, Human safety.

4. Compressors Pressure–volume diagram of a compressor, Types of compressor–reciprocating (semi-hermetic, hermetic and open types), rotary, centrifugal and crewed type. Working of compressor, Difference between ammonia and freon compressors, Volumetric efficiency. **5**

5. Compressor construction, Valves, pistons, connecting rods, crankshafts, seals, oil circulation, hermetic and semi-hermetic units, Cooling of windings, Mufflers. **5**

PRACTICAL

Time: 3 Hours *Marks: 60*

1. Study of Tools and materials, Instruments and Gauges. **5**
2. To learn proper techniques of cutting, fitting, reaming, bending, flaring of soft and hard copper tubing, swedging, etc. **5**
3. To learn brazing of copper tubing. **5**
4. To understand the construction and functions of reciprocating compressors, condensers, and evaporators. **5**
5. To study a hermetic unit and its testing. **5**
6. To study pressure gauges and testing themina deadweight tester. **5**
7. Saturation pressure and saturation temperature, Measurement of Water and Refrigerants. **5**
8. Measurement of Temperature during throttling expansion of a Gas. **5**
9. Energy Balance of a Refrigeration machine. **5**
10. To study Domestic Refrigerator, Water Cooler, etc. **5**
11. Study of various types of compressors, dismantling and assembling compressor. **5**
12. Testing of reciprocating compressors. **5**

CLASS–XI
ELECTIVE
AIR CONDITIONING AND REFRIGERATION–II (633)
THEORY

Time: 2 Hours ***Marks: 40***

1. Meaning of Alternating Current and Voltages, Wave Shape, Maximum, Average and R.M.S. Values, Phase Difference. **4**
2. Series and parallel circuits, Application of Kirchhoff's Law, Star and Delta connections. **6**

   Measurements of current, voltage and power, Representation of circuit elements by proper symbols, Circuit diagrams.
3. Synchronous Machines. **4**
4. Induction Motors, Principles of working, construction details, and performance of SlipRing Squirrel Cage, Single Phase and Poly phase Induction Motors, Use of Megger for testing. Rewinding of single phase and poly phase motors, Detecting faults, Testing of Motors. **6**
5. Psychometry– Composition of air, moist air, vapours and gases, specific humidity, absolute humidity, degree of saturation, relative humidity, Dry Bulb Temperature, Wet Bulb Temperature, Dew Point Temperature, Wet Bulb Depression, Dew Point Depression, Dalton's Law of Partial Pressures, Enthalpy of moist air, Adiabatic Saturation Temperature, Introduction to Psychrometric Chart and Psychrometers. **8**
6. Human comfort, Concept of effective temperature, Comfort Zone. **4**
7. Applications of Air Conditioning, Comfort, Industrial and Process Air Conditioning, Study of Window – type Air Conditioners, package units, Central Air Conditioning Plants. **4**
8. Measurement of air velocity and flow. **4**

PRACTICAL

Time: 3 Hours ***Marks: 60***

1. Measurement of humidity. **2**
2. Measurement of air-velocity and flow. **3**
3. Study of room air conditioner. **4**
4. Study of Package Units. **5**
5. Performance Testing of Air Conditioner and measurement of capacity. **4**
6. Charging and testing of air-conditioner. **2**
7. Measurement of Volage, Current, Power etc. **4**
8. Series and parallel circuit arrangement and testing. **5**
9. Making Star - Delta Connections. **6**
10. Study of synchronous Machines and Components. **5**
11. Study of single phase and three phase induction motors. **4**
12. Detecting faults in Motors such as short-circuiting between phases, grounding open circuit etc. **6**
13. Testing of motors. **5**
14. Making electric circuit diagrams. **5**

CLASS–XI
OPTIONAL
ENGINEERING SCIENCE (622)
(Common for Automobile Technology and Airconditioning & Refrigeration Technology)

(Refer to page 22)

CLASS–XI
GENERAL FOUNDATION COURSE (501)
(Common for Engineering & Technology Based Courses)

(Refer to page 7)

CLASS–XII
ELECTIVE
AIR CONDITIONING AND REFRIGERATION–III (632)
THEORY

Time: 2 Hours ***Marks: 40***

1. Psychometric Processes- Sensible Cooling and Sensible Heating, Cooling with dehumidification, cooling with adiabatic humidification, chemical dehumidification, heating and humidification, Mixing of air streams, Absorption, Dehumidifiers, Steam injection, Coil and Spray Equipment, Evaporative cooling, Air Washers, By pass Factor. **5**
2. Principles of Load Estimating, Internal and External System Heat Gains, ventilation, air cleaning, Room sensible heat factor, effective room sensible heat factor. **5**
3. Refrigerant controls, Types of expansion devices and sensible heat factor, construction and operation of automatic and thermostatic valves, capillary tubes, low and high pressure side float valves, testing and adjusting thermostatic expansion valves, solenoid valves. **6**
4. Principles of heat transfer, Conduction, convection and radiation, Overall heat transfer coefficient, Use of fans, Effect of air velocity on heat transfer coefficient, Properties of insulating materials. **4**
5. Evaporators, Types of evaporators-dry and flooded, Heat absorbed in evaporators, Water chillers, brine coolers, Methods of defrosting. **4**
6. Condensers, Air and water cooled, and evaporative types, Heat rejected in condensers. Purging, Construction of condensers, Driers, Receivers. **4**
7. Refrigerants, their properties and nomenclature R11, R12, R22, R502, R113, R114, ammonia, and carbon dioxide, pressure with various refrigerants in different systems, oil miscibility, solubility in water, Secondary refrigerants, Brines and Glycols. **4**
8. Absorption refrigeration system. **3**
9. Applications, Ice manufacture, Cold storage, Ice Cream manufacture, Dairy refrigeration etc. **2**
10. Leak detection, Pressure Testing and Charging. **3**

PRACTICAL

Time: 3 Hours ***Marks: 60***

1. Measurement of Air Flow with a Pitot Tube.
2. Study of flow control devices.
3. Testing of Thermostats.
4. Experiment with Mixing of Air.
5. Experiment with Simple Heating.
6. Experiment with Steam Injection.
7. Experiment on an Evaporative Cooler.
8. Energy Balance of an Air Conditioner.
9. Fault Detection.
10. Experiment on a Cooling Tower.
11. Study of expansion-valves, testing and adjusting.
12. Performance testing of Refrigerating system.
13. Volumetric Efficiency of a Reciprocating compressor and Testing a compressor.
14. Pressure Testing and leak detection Methods.
15. Charging procedure and charging correctly a refrigerator.

LIST OF EXPERIMENTS

1. To dismantle a Reciprocating compressor open and sealed type.
2. To assemble a Reciprocating compressor open and sealed type.
3. To cut gaskets.
4. To Flare, Swedge, bend, punch and braze copper tubes.
5. To charge and test oil in the compressor.
6. To repair and service condenser and evaporator.
7. To study different types of flow control devices and to test are frigerant control valve.
8. To test the leakage of the system.
9. To evacuate the system.
10. To prepare series and parallel circuits and testing board.
11. To change the refrigerant in the system.
12. To identify fault/faults in refrigeration system.
13. To solder, rivet and steam a thin sheet.

Note: Each student should perform all the experiments during the session.

MARKING SCHEME

Marks: 60

Note:

1. Marks for sessional work will be awarded by the teacher concerned.
2. Students may be asked to perform any one experiments.

DISTRIBUTION OF MARKS

1.	**Experiments**	**40**
(a)	Identification of components.	**8**
(b)	Identification of different parts of compressor.	**8**
(c)	Functioning of different components.	**8**
(d)	Working of components.	**8**
(e)	Methods of working and safety precautions observed.	**8**
2.	**Viva Voce**	**10**
(a)	Questions related to the experiment assigned.	**3**
(b)	Questions related to the remaining experiments.	**4**
(c)	Questions based on related concepts.	**3**
3.	**Sessional Work**	**10**
(a)	All listed experiments to be performed.	**5**
(b)	Maintenance of proper record.	**5**

GUIDELINES FOR EXAMINERS

(Common for Elective II & III)

Note: Examiner will evaluate the Candidates on the following guidelines:

1. Systematic approach to the problem.
2. Safety precautions and sequence of work.
3. Initiative taken and concentration by the individual.
4. Proper use of tools.
5. Workmanship, finish and working ability must be given a special consideration.
6. Special attention to the tools and equipments taken by the individual.

GENERAL INSTRUCTIONS TO THE CANDIDATES

(Common for both Elective II & III)

1. Proper dress must be used by the student during practical and must be aware of the safety precautions to be observed.
2. Student must complete the practical himself and not merely watch others doing it.
3. Student should draw simple line diagram of the assembly components, circuits and note the important points.
4. Student must know the tools and equipments used for the particular exercise with the specification of each tool.
5. After completing the practical exercises student must write in his/her practical note book about the practical under the following headings:
   (a) Title of Exercise.
   (b) Tools, equipment and material used with complete specifications.
   (c) Time taken for the particular exercise.
   (d) Procedure.

(e) Safety precautions observed.

6. In case of any difficulty student must approach the teacher without any hesitation.
7. During practical work one should not disturb others.
8. Students must know how to repair the tools used in the exercise.
9. After using the tools should be cleaned and placed in proper way.

CLASS–XII
ELECTIVE
AIR CONDITIONING AND REFRIGERATION–IV (633)
THEORY

Time: 2 Hours ***Marks: 40***

1. Air Conditioning Systems and Equipments, Classification of air conditioning systems–all air and all water types, Fans, blowers, grills, resistors, filters, compressors, cooling coils, condensers, air handling units, fan coil units, Heating and humidifying equipments, Unit air conditioners, package units central air conditioning plants. **10**
2. Air Distribution, System of air distribution, Duct systems, Cooling Load, Air quantities, Pressure inducts–static pressure, velocity pressure and total pressure, Friction losses, Duct sizing, Duct lay-out and drawing, Duct construction. **10**
3. Controls, Sensing elements–bimetallic, bulb and bellow, solenoids, electric resistance type etc. Actuating elements–thermostats, humidistat's, pressure stats etc. **4**
4. Modulating Motors, Construction and operation, By pass controls, Use of chokes, for controlling fan motor speed.**4**
5. Starters, Capacitors, relays, overload controls, for motors and their servicing. **4**
6. Refrigeration Controls, H.P. and L.P. cut outs, oil failure safety switches, power element testing. **4**
7. Maintenance–Preventive and break down maintenance, Diagnosis and rectification of faults in electrical system, refrigeration system and air conditioning system, Pressure testing, Charging Performance Testing. **4**

PRACTICAL

Time: 3 Hours ***Marks: 60***

1. Study of Sensing Elements.
2. Study of Low and High Pressure Cut Outs.
3. Study of Thermostat, Humidistat, Pressure Stat, etc.
4. Study of capacitors, Relays, Over loads, chokes, etc.
5. Study of Modulating Motors.
6. Study of pressure Drop in Ducts.
7. Testing of Power Elements.
8. Testing of Thermostats.
9. Repairing a Hermetically sealed Unit.
10. Complete servicing of a Refrigerator.
11. Complete servicing of an Air Conditioner.
12. Fault detection.
13. Adjusting the automatic system.

14. Wiring diagrams of an Air Conditioner and central plants.
15. Wiring diagrams of Multi cylinder Compressor for capacity control.
16. Industrial visits.

PRACTICAL GUIDELINES

Parameters	Marks
Project / Practical Activities	15
Viva Based on Project	10
Practical File / Report or Portfolio	10
Demonstration of Skill Competency in Lab Activities	25
Total	**60**

CLASS–XII
OPTIONAL
ENGINEERING SCIENCE (622)
(Common for Automobile Technology and Airconditioning & Refrigeration Technology)

(Refer to page 28)

CLASS–XII
GENERAL FOUNDATION COURSE (501)
(Common for Engineering & Technology Based Courses)

(Refer to page 13)

MARKING SCHEME

Marks: 60

Note:

1. Marks for sessional work will be awarded by the teacher concerned.
2. Students may be asked to perform any one experiment.

DISTRIBUTION OF MARKS

1.	**Experiment**	**40**
(a)	Different components used in Refrigeration and Air Conditioning.	**8**
(b)	Properties of air related to Air Conditioning.	**8**
(c)	Refrigerant control.	**8**
(d)	Electrical wiring of window type Air Conditioner and Refrigerator.	**8**
(e)	Properties of Air related to A.C.	**8**
2.	**Viva-Voce**	**10**
(a)	Questions related to the experiments assigned.	**3**
(b)	Questions related to the remaining experiments.	**4**
(c)	Questions based on related concepts.	**3**
3.	**Sessional Work**	
(a)	All listed experiments performed.	**5**
(b)	Maintenance of proper record.	**5**

GUIDELINES FOR EXAMINERS

General Instructions to the Students/Candidates same as Elective II

Note: The Lists of Equipment & Consumables in respect of Engineering based vocational courses have been prepared for a Batch of 20 Students attending the Practical Work at a time. However, in case of Consumables if the class strength of Students exceeds 20, the quantities should be increased proportionately.

LIST OF RECOMMENDED BOOKS

1. Principles of Refrigeration, March and Olive Taraporewale.
2. Principles of Air Conditioning, V. and Lang Taraporewale.
3. Refrigeration Servicing, P.F. Galibet, Taraporewale.
4. Principles of Refrigeration, R.J. Dossat, Wiley.
5. ASHRAE Handbooks.
6. Modern Refrigeration and Air Conditioning by Althouse, Turnquist and Bracciane (Good Wort, Wiley).
7. Refrigeration and Air Conditioning by Sarae, Gabbiand Singh (Satya Prakashan).
8. Refrigeration and Air Conditioning by Narang and Jaina (Katson).
9. Refrigeration and Air Conditioning by Domkundwar and S.C. Arora.
10. Refrigeration and Air Conditioning by R.S. Khurana.
11. Refrigeration and Air Conditioning by P.L. Ballancy.

SUGGESTED LIST OF TOOLS, MEASURING INSTRUMENTS AND VEHICLES

S. No.	Name of Item	Quantity
1.	Kammer Ball-pane1/4Kg.	12

S. No.	Name of Item	Quantity
2.	Plier combination (Insulated) 15cm.	6
3.	Plier side cutting 15 cm.	6
4.	Plier heavy duty insulated 20 cm.	5
5.	Plier Flat nose 15 cm.	5
6.	Screw Driver 10 cm.	6
7.	Screw Driver 20 cm.	12
8.	Pin punch 10 cm.	6
9.	Centre Punch 10 cm.	6
10.	Rule 30 cm (Steel).	5
11.	Scriber 15 cm.	5
12.	Knife double edge.	5
13.	Oilstone 20×5×2.5 cm Carborundum.	2
14.	Try Square Engineering 20 cm.	6
15.	Tap and Dies whit worth 3 to 12. Ty1-5 mm with die handle and tap.	1 Set
16.	Tap and dies BAO to 6 with the holder and Tap Wrench.	2 Set
17.	Standard pipe die 9.5 to 38 mm with handle.	2 Set
18.	Drill H.S.S. Parallel shank 1.5 to 12 mm by 1.5 mm.	1 Pair
19.	Hand Drill 6 mm capacity.	4 No.
20.	Bench grinder 1/2 HP, 250 volt.	1 No.
21.	Fire Extinguisher.	3 Nos.
25.	Sealing copper washer for stand.	10 each
	(a) Filling (Assorted).	10 each
	(i) 10×1m	10 each
	(ii) M-12, M-14, M-16, M-18, M-22, M-26	6 Nos.
26.	Drill Machine Electric 12 mm cap with stand (portable).	6 Nos.
27.	Tube cutter 3 to 25 mm cap.	3 Nos.
28.	Measuring Tap 200 cm (watch makers).	2 Nos.
29.	Instruments (watch makers) screw driver1–5 mm lap1set of 6.	3 Set
30.	Blow lamp 1 litre capacity.	3 Nos.
31.	Hammer, steel head with heads in set 28.5 mm.	3 Nos.
32.	Spanner socket size 4.7 mm to 15 mm.	1 Set

S. No.	Name of Item	Quantity
	10 to 31 mm with reversible rachet short and long couplet.	
33.	Spanner ring D.E. off-set Multi point AE6 mm to 28 mm.	3 Set
34.	Electric Heaters.	1 No.
35.	Spanner open Jaw DE and across Flat 6 to 28 mm.	3 Set
36.	Spanner and Ring DE offset Multi Point with 4 to 15 Try 1.5 mm.	2 Set
37.	Spanner open Jaw DE across.	3 Set
38.	Wrench steel grip 2.5 cm cap.	3 Nos.
39.	Inside reamer.	1 No.
40.	Outside reamer.	1 No.
41.	Electronic leak detector Neon bulb.	1 No.
42.	Grip footprint 15 cm.	3 Nos.
43.	Spanner BA open Jaw DEO to 10.	3 Set
44.	Spanner sockets BA size 0–10.	3 Set
45.	Portable torch for soldering brazing for LPG/0-4.	1 Set
46.	Allen Key 1.5 to 12×0.4 mm.	3 Set
47.	Hacksaw frame adjustable.	4 Nos.
48.	Hand lamp wandering lead 10m.	3 Nos.
49.	Single thickness flaring tool with yoke size 4.5 mm to 15 mm.	1 Set
50.	Viceh and 5cm Jaw.	2 Nos.
51.	Viceh and 10cm Jaw.	2 Nos.
52.	High Vacuum pump 2 or 3 HP.	1 No.
53.	Charging board complete with calibrated glass and manifolds.	1 No.
54.	Flexible charging lines.	4 Nos.
55.	Bearings craper 15cm.	3 Nos.
56.	Hollow Punch.	3 Nos.
57.	Prick Punch.	3 Nos.
58.	Thermometers (–10^{o}C to – 700^{o}C).	12 Nos.
59.	Pocket Thermometer.	12 Nos.
60.	Adaptor Ammeter Volt-meter Instrument.	1 No.
61.	Remote bulb thermometer 10 cm dia (10^{o}C to 70^{o}C).	2 Nos.
62.	Compound gauge 6 cm dial with graduation.	6 Nos.
63.	Pressure gauge 6 cm dial 0–15 Kg/cm2.	6 Nos.

S. No.	Name of Item	Quantity
	With 2Kg/cm2 graduation.	
64.	Shut off valve socket and TEE handed Key for 6mm.	3 Nos.
65.	Shut off valve socket and Tee handed key for 4 mm.	3 Nos.
66.	Gland packing socket & Tee handed key for 6 mm.	3 Nos.
67.	Gland packing socket & Tee handed key for 4 mm.	3 Nos.
68.	Measuring glands for oil 0.45Kg.	3 Nos.
69.	Pocket Testing lamp.	3 Nos.
70.	6 mm copper tube 8 metre long for charging line and gauge.	3 Nos.
71.	Pulley puller 3 legged 20 cm.	1 No.
	30 cm	1 No.
75.	Swedging Tools 6–9 mm.	2 Sets
76.	Glass lapping Block 45×45×6 mm.	2 Nos.
77.	Spring Balance dial Type 0–50 Kg..	2 Nos.
78.	Techno meter.	1 No.
79.	Sling Psychrometer.	6 Nos.
80.	Tube bending tool for Brass & Copper Tubes upto 15 mm.	1 Set
81.	Pipe bender spring Type for bending Universal.	2 Nos.
82.	Ratchet wrench 4–6 mm.	3 Nos.
83.	Cleaning Trays 60×60×5.	6 Nos.
84.	Refrigerators household assorted type (Reciprocating), different capacities.	3 Nos.
85.	Second hand refrigerator, repairable condition.	2 Nos.
86.	Compressor fractional HP for refrigeration with 1HP motor Hermetically sealed compressor.	2 Nos.
87.	Room Air Conditioner, second hand in repairable condition.	2 Nos.
88.	Refrigerator.	1 No.
89.	Room cooler.	1 No.
90.	Thermostatic Expansion valve.	6 Nos.
91.	Automatic Expansion valve.	6 Nos.
92.	Thermostatic switch.	3 Nos.
93.	Low pressure cutout.	1 No.
94.	Solenoid valves.	1 No.
95.	High pressure cutout.	6 Nos.

S. No.	Name of Item	Quantity
96.	Check valve.	2 Nos.
97.	Wheel spanner.	2 Nos.
98.	Liquid Line indicator 9×9 mm (sight glass).	3 Nos.
99.	Two way valves.	3 Nos.
100.	Three way valves.	3 Nos.
102.	Hand shut off valves 6 mm.	12 Nos.
103.	Hand shut off valves 8 mm, 12 mm.	6 Nos. each
104	Hand shut off valves 15 mm.	3 Nos.
105.	Lockers, 24 pigeon holes.	1 No.
106.	Demonstration Table/Working Bench 2½×2×1m.	4 Nos.
107.	Almirah Steel.	4 Nos.
108.	Chairs (Steel).	4 Nos.
109.	Charts and Models of machine parts with duct arrangements.	2 Nos.
110.	Desert cooler.	1 No.
111.	Water Cooler second hand.	1 No.
112.	Deep Refrigerator second hand.	1 No.
113.	Insulation-Thermocole, Fibre-glass.	1 No.
114.	Anemometer.	1 No.
115.	Micro voltmeter.	1 No.
116.	Thermocouples (Copper constantan).	3 Nos.
117.	Cut-Modelo for pentype compressor.	1 No.
118.	Empty cylinder for F12, F22 capacity 10 Kg.	1 each
119.	Multimeter P125210/Type 260.	1 No.
120.	Soldering Iron 0.125 Kilowatt.	1 No.
121.	Trolley for gas cylinder.	1 No.
122.	Pinching Tool.	3 No.
123.	File, flat, rough (25 cm).	2 Nos.
124.	File, flat, smooth (25 cm).	2 Nos.
125.	Mallett wooden 15 to 76 cm dia.	2 Nos.
126.	Voltmeter 0–500 volts.	2 Nos.
127.	Ammeter 0–25 A.	2 Nos.
128.	Ammeter 0–10 A.	2 Nos.

S. No.	Name of Item	Quantity
129.	Drill (Electric) 12 mm with stand (Portable).	1 No.

AIR CONDITIONING AND REFRIGERATION CONSUMABLES AND RAW MATERIALS

S. No.	Name and Particulars of Item	Quantity
1.	Jack-saw Blades 30 cm × 1.25 cm.	5 doz.
2.	Solder 20% lead 80% tin.	1 Kg.
3.	Fastener.	1 Kg.
4.	Copper Tubing 6 mm Internal 9 mm Internal	 15 m. 9 m.
	12 mm Internal 15 mm Internal	3 m. 3 m.
5.	Silver Soldering Lead 42% (Easy Flow) Rod.	½ Kg.
6.	Emery Paper (Assorted).	2 doz.
7.	Emery cloth (Assorted).	2 doz.
8.	Solvent cleaning.	10 litre
9.	Lubricant cleaning.	1 litre
10.	Compressor oil (Copius).	10 litre
11.	Cotton waste.	10 Kg.
12.	Spirit.	4 litre
13.	Gasket 4 mm 1.5 × 0.6 m.	1 No.
14.	1 mm 1.5 × 0.6 m.	1 No.
15.	0.5 mm 1.5 m × 0.6 m.	1 No.
16.	Capillary tube 1.5 mm,1 mm, 0.5 mm.	10 each
17.	Araldite (Economy size).	1 No.
18.	Thermocole sheet.	5 No.
19.	Flare Nut (assorted).	10 doz.
20.	Compressor connectors 1/4"×1/8" M.P.T.	1 doz
21.	-do- 1/4" × 1/4" M.P.T.	1doz.
22.	Freon 22.	5 Kg.
23.	Oil.	20 Litre
24.	Grease.	1 Kg.
25.	Wire 2 mm (P.V.C.).	2 coil
26.	P.V.C. wire 4 mm.	2coil
27.	Nails, clips and clamps.	1 packet of 100

S. No.	Name and Particulars of Item	Quantity
		coils
28.	Wood-woods having.	80 Kg.
29.	Plastic pipe 9mm, 12 mm, 15 mm.	4 m each
30.	P.V.C. conduit 12 mm dia.	20 No.
31.	P.V.C. conduit cross bent C.T.C.	6 each
32.	P.V.C. Reducing Bush.	(As required)
33.	P.V.C. Container size: 10 litres, 25 litres.	3each
34.	Lead.	1 Kg.
35.	Button Holder 5 amp.	(As required)
36.	S.P. Switch 5 amp.	10 Nos.
37.	S.P. Switch 5 amp.	1No.
38.	Turpentine Oil.	5 litre
39.	Bitumen compound.	1 Kg.
40.	B Electric lamp for Domestic Refrigerator, Commercial Refrigerator.	3 Pieces
41.	Brine salts.	
	(a) NaCl	5 Kg.
	(b) CaCl2 (c) HgCl	5 Kg. 5 Kg.
42.	Litmus solution.	25 ml
43.	Insulating tape.	6 rolls
44.	Black paint for conductor.	2 Kg.
45.	Painting Brush (assorted).	3 Nos.
46.	Insulating coaching mud.	2 Kg.
47.	White enamel paint.	1/2 Kg.
48.	Demonstration Board 1.8 m×1.2 m.	3 Nos.
49.	Petrol.	1litre
50.	Wire Brushes 5cm (Steel).	3 Nos.
51.	Dead Nut (Assorted).	3 Kg.
52.	Old Dhoti.	25 Nos.
53.	Soldering Flux.	1 Kg.
54.	Relay 1/4 HP.	2 Nos.
55.	Refrigerant filter.	2 Nos.
56.	Relay.	2 Nos.
57.	Silica.	1 Kg.
58.	Capacitor 50 uf.	3 Nos.
59.	Running capacitor	10 Nos.

S. No.	Name and Particulars of Item	Quantity
60.	Overload protector.	4 Nos.
61.	Hermetically sealed compressor (Second Hand).	1 No.
62.	Flaring toolset.	2 Nos.

LIST OF (CONSUMABLE) FOR ENGINEERING DRAWING & DRAWING OFFICE

S. No.	Name and Particulars of Item	Quantity
1.	Drawing sheets Imperial size, superior quality.	6 dozen
2.	Water proof veeto ink, black.	6 Nos.
3.	Cello tape small roll 12 mm wide.	6 Nos.
4.	Cello tape medium roll 18 mm wide.	6 Nos.
5.	Brass Drawing pins superior quality.	One gross
6.	Ink eraser (rubbers).	2 Nos.
7.	Drawing Rubber, Superior.	3 Nos.
8.	Drawing pencil, 2H, H, HB, B (1 dozen each).	4 dozen
9.	Ammonia paper, Roll 10 m.	10 Rolles
10.	Tracing Paper Roll 101 cm–18.3 m.	One Roll
11.	Cloth duster.	3 Nos.
12.	Soap bar.	6 Bars
13.	Liquid NH3 bottles.	3 Nos.

ELECTRONICS TECHNOLOGY

Course Objectives

After successfully completing the two year of senior secondary vocational course, the student would have acquired relevant appropriate and adequate technical knowledge together with the professional skills and competencies in the field of Electronics so that he/she is properly equipped to take up gainful employment in this Vocation.

Thus he should have acquired

A. Understanding of

(a) The relevant basic concepts and principles in basic science subjects (Physics, Chemistry and Mathematics) so that he/she is able to understand the different vocational subjects.

(b) The basic concepts in engineering drawing.

(c) The concepts, principles of working of basic electronic devices and circuits.

(d) The knowledge of testing procedure of components and circuits by making use of different test instruments.

(e) The procedure of making P.C.B.

(f) The concepts and principles used in Radio/Audio/Video Systems and Communication devices and its maintenance.

B. Adequate Professional Skills and Competencies in

(a) Testing different electronic components.

(b) Testing the performance of electronic circuits.

(c) Locating the fault at component level and at the stage level.

C. A Healthy and Professional Attitude so that He/She has

(a) An analytical approach while working on a job.

(b) An open mind while locating/rectifying faults.

(c) Respect for working with his/her own hands.

(d) Respect for honesty, punctuality and truthfulness.

CLASS–XI
ELECTIVE
BASIC ELECTRONICS (789)
THEORY

Time: 2.5 Hours ***Marks: 50***

1. Overview of Atom, Sub-Atomic Particles and CRO — 5

- Brief History of Electronics.
- Atom and its elements, Bohr Atomic model, Atomic energy level.
- Electron, Force, Field intensity, Potential, Energy, current, current density, Ionization potential.
- Electric field, Magnetic field, Motion of charged particles in electric and magnetic field.
- Overview of CRO, Electronic and Magnetic deflection in CRO, Applications.

2. Voltage and Current — 10

- Resistance, Ohm's law, V-I Characteristics, Resistors, Capacitors, Inductors.
- Voltage and Current sources, Symbols and Graphical representation, Conversion of current and voltage sources.

- Overview of AC, DC, Cells and Batteries, Energy and Power.

3. Basics of Semiconductor 15

- Semiconductor materials, Energy band structure of Insulators, Metals and Semiconductors, Energy gap, Field and Photo-electric emission.
- Intrinsic & Extrinsic semiconductor, N-type and P-type semiconductor, Drift current, Diffusion current and Total current, Mobility of charges, Effects of temperature on Conductivity of semiconductor.
- PN junction diode, depletion layer, potential barrier, Forward & Reverse bias, V-I Characteristic, Effects of temperature, Resistance levels, Breakdown in Junction diode, Zener diode, Photo diode, LED, Types and applications of diode.
- Diode as a rectifier, Half wave and full wave rectification, Voltage multipliers, Zener diode Regulator.
- *Special information – (Introduction to Filters, Clippers, Clampers).

4. Bipolar Junction Transistor 10

- Construction and operation of NPN and PNP transistors, Biasing of BJT.
- CB, CE and CC configuration, Characteristics and transistor parameters for CB, CE, CC configuration.
- Introduction to FET, JFET, MOSFET, CMOS and VMOS, Characteristics of various transistors, Comparison of various transistors.

5. Transistor Amplifier and Applications 10

- Introduction, Single and Multi stage amplifiers, General amplifier characteristics, Feedbacks in amplifier.
- Introduction to Oscillators, Multi-Vibrators and Signal generator.
- *Special information - (Introduction to Thyristors, PNPN diode, SCR, LASCR, DIAC, TRIAC).

PRACTICAL

Time: 2.5 Hours ***Marks: 50***

1. Study of current and voltage measurement using Ammeter and Voltmeter.
2. Study of current and voltage measurement using Galvanometer.
3. Study of current, voltage and resistance measurement using of Multi-meter
4. Study of Power and Energy measurement using Wattmeter and Energy meter.
5. Study of working principle of Signal Generator and measurement of amplitude, time period and frequency of signal using Oscilloscope.
6. Study of V-I Characteristic of Diode.
7. Study of V-I Characteristic of Zener Diode. And use of Zener Diode as voltage regulator.
8. Study of Half wave rectifier with and without filter circuit.
9. Study of Full wave rectifier with and without filter circuit.
10. Study CE configuration for NPN and PNP transistors and measurement of voltage and current gain.
11. Study CB configuration for NPN and PNP transistors and measurement of voltage and current gain.
12. Study CC configuration for NPN and PNP transistors and measurement of voltage and current gain.
13. Study of working of single layer PCB manufacturing
14. Study of working of double layer PCB manufacturing.

15. Design of 7 segment display using LED and bread board.

PRACTICAL GUIDELINES

Parameters	Marks
Project / Practical Activities.	10
Viva Based on Project.	10
Practical File / Report or Portfolio.	10
Demonstration of skill Competency in Lab Activities.	20
Total	**50**

CLASS–XI
ELECTIVE
DIGITAL ELECTRONICS (790)
THEORY

Time: 2.5 Hours ***Marks: 50***

1. Number Systems and Boolean Algebra — 10

- Basics of Analog and Digital.
- Number systems: Binary, Octal and Hexadecimal, Fixed point, floating point 1's complement, 2's complement, conversions and arithmetic operations, BCD, Gray code, ASCII codes.
- Boolean algebra, De-morgan's law, Truth tables.

2. Logical Circuits — 12

- Logic gates: Negative logic and positive logic, AND, OR, NOT, NOR, NAND, XOR, XNOR.
- Combinational Circuits:
  - (i) Arithmetic Circuits: Half adders, Full adders , Subtractors,
  - (ii) Data Processing Circuits: Encoders, Decoders, Multiplexers, De-Multiplexers, Code converters, Comparators.

3. Latches and Flip-Flops — 12

- Concept of Latches, Types of Latches, SR latch.
- SR Flip Flop, JK Flip Flop, D Flip flop , T Flip Flop, Flip Flop as basic memory.
- Introduction to counters, Types of counters Asynchronous and Synchronous.
- Introduction to shift registers, types of shift registers, Universal shift registers.
- *Special Information – (Right shift, Left shift, Bi directional).

4. Introduction to Display Devices — 8

- LED, LCD, 7 segment display, Common anode and Common cathode display.

5. Integrated Circuits and Memories — 8

- Introduction to IC's, Importance and applications, Linear and Digital IC's.
- Introduction to SSI, MSI, LSI and VLSI (Terminology & Definitions).

- Memory Organisation and Operations, Classification and Characteristics of memories, RAM, ROM.
- Block diagram of basic microprocessor system and microcontroller system, applications.

PRACTICAL

Time: 2.5 Hours ***Marks: 50***

1. Verification of truth tables for AND, OR, NOT and NAND logic gates.
2. Verification of truth tables for NOR, XOR and XNOR logic gates.
3. Construction and verification of operations of half adder and full adder circuits using basic gates.
4. Construction and verification of operations of half adder and full adder circuits using XOR gates.
5. Construction and verification of operations of full adder and full adder circuits using NAND gates.
6. Construction and verification of operations of half & full Subtractor circuit using basic gates.
7. Construction and verification of operations of half & full Subtractor circuit using XOR gates.
8. Construction and verification of operations of half & full Subtractor circuit using NAND gates.
9. Study and verification of truth tables for 3 line to 8 line decoder.
10. Study and verification of truth tables for 8 line to 3 line and 10 line to 4 line encoder.
11. Study and verification of truth tables for 4:1 MUX using gates
12. Study and verification of truth tables for 1:4 DEMUX using gates.
13. Study and verification of truth tables for 8:1 MUX using IC 74151.
14. Study and verification of truth tables for 1:8 DEMUX using IC 74138.
15. To study and verify the truth table of excess-3 to BCD code converter.
16. To study and verify the truth table of binary to gray code converter.
17. Construction and verification of truth tables for S-R, D and J-K flip flops.
18. Study working of various display devices. (LED, Common anode, Common cathode 7 segment display)
19. Study and verification of truth table for universal shift register.
20. Study the operation of a synchronous counter.

PRACTICAL GUIDELINES

Parameters	Marks
Project / Practical Activities.	10
Viva Based on Project.	10
Practical File / Report or Portfolio.	10
Demonstration of skill Competency in Lab Activities.	20
Total	**50**

CLASS–XI
GENERAL FOUNDATION COURSE (501)
(Common for Engineering & Technology Based Courses)

(Refer to page 7)

CLASS–XII
ELECTIVE
OPERATION AND MAINTENANCE OF COMMUNICATION DEVICES (789)
THEORY

Time: 2.5 Hours ***Marks: 50***

1. Introduction to Communication System 15

- Information signals, Elements of communication system, Transmitters and Receivers, Bandwidth of signals, Propagation of electromagnetic waves in the atmosphere, Sky and space wave propagation.
- Noise, Classification of noise, Source and description of noise.
- Fundamentals of Analog and Digital communication, Digital data transmission.
- Need of modulation, Modulation/ Demodulation of Amplitude-modulated wave, Phase- modulated and Frequency modulated wave, Pulse modulation.
- Introduction to Wireless communication, Basics of mobile communications, A simple reference model, Mobile and Wireless devices.
- Frequencies for Radio Transmission, Regulations act.
- Basics of cellular system, Elements of cellular radio systems, Performance criteria.

2. Satellite Communications 5

- Introduction and brief history of satellite communication, Overview of Satellite system.
- Satellite frequency bands, Introduction to Telemetry, Tracking and Command, Satellite mobile communication, Introduction to C/N ratio and S/N ratio, Introduction to VSAT technology.
- *Special Information - (Introduction to Radio propagation and Antenna).

3. Mobile Technology 10

- History of Mobile technology, Generation of mobile phones.
- Basics of TDMA, FDMA, CDMA and GSM, Mobile Services.
- (* Special Information - GSM and CDMA Architecture).
- Overview of Mobile phone components, Bluetooth, Infrared, GPRS, Wi-Fi, SIM, IMEI.
- (* Special Information - DECT, UMTS, IMT-2000).
- Base and Master system

4. Mobile Hardware and Software 10

- Introduction to Mobile hardware and their faults, Basic circuit board configuration, Identification and Working of different BGA IC's, Working on SMD and PCB's.
- Introduction to software and their faults, Formatting of virus affected mobiles, Removing software problems by codes, Unlocking of mobile phones using codes and software, Unlocking codes for GSM & CDMA.

5. Support Program 10

- How to open and manage your own mobile repair shop.

- How to successfully work as a technician.
- Where to procure tools, spare parts and accessories.
- How to deal with customers and distributers.
- Technical support guidance.

PRACTICAL

Time: 2.5 Hours ***Marks: 50***

1. Assembling & disassembling of different types of mobile phones.
2. Use of various tools & instruments used in mobile phone repairing.
3. Study of basic parts of mobile phones (mic, speaker, vibrator, LCD, antenna, etc) And Testing of various parts with multi-meter.
4. Recognize different IC's and study their working.
5. Soldering and De-soldering of different BGA IC's using soldering iron.
6. Practice of changing Driver IC Jumper.
7. Practice of changing Display in mobiles.
8. Practice of changing various jacks in mobile phones.
9. Practice of changing Bluetooth module.
10. Cool testing and hot testing of mobile phones for fault finding.
11. GSM
12. CDMA

PRACTICAL GUIDELINES

Parameters	Marks
Project / Practical Activities.	10
Viva Based on Project.	10
Practical File / Report or Portfolio.	10
Demonstration of skill Competency in Lab Activities.	20
Total	**50**

CLASS–XII
ELECTIVE
TROUBLE SHOOTING & MAINTENANCE OF ELECTRONIC EQUIPMENTS (790)

THEORY

Time: 2.5 Hours ***Marks: 50***

1. Basic Occupational Safety and Precautions **15**

2. Microphones and Loudspeakers **5**

- Construction, working principle and frequency response of Carbon Microphone, Variable Reactance Microphone, Capacitance Microphone, Piezo-Electric Microphone, Moving Coil Microphone.

- Frequency ranges of musical instruments, Intensity and Dynamic Range, Constructions and working principles of Moving Coil Loudspeaker, Impedance and Power Level of loudspeaker, Frequency characteristics of Practical Loudspeakers: Woofer, Tweeter, Squawker, and Loudspeaker Enclosure.

3. Recorders 10

- Analog and digital sound recording, Disk recording and reproduction, working principle with block diagram of disk recording and reproduction.
- Principle of magnetic recording and playback, Requirement of bias, Working principle with block diagram of a tape recorder system.
- Principle of optical recording, CD/ DVD manufacturing and recording, CD/ DVD player system, Advantages/ Disadvantages.
- Steps for Fault finding & Analysis.

4. TV System 10

- Working principle with block diagram of TV transmitter and receiver, Brief description with circuit diagram: TV Tuner, Video IF stage, Sound stage, Picture tube & its associated circuit, Synchronizing circuits, Horizontal & vertical deflection circuits, Remote control of a TV receiver, Idea of bandwidth, blanking and synchronization pulses, modulation scheme, monochrome system, extension of colour transmission.
- Channel and cable type TV system, Head end processor, Trunk & cable distribution system with block diagram, Scrambling.
- Introduction to LCD and LED TV systems, Introduction to high definition systems.
- Steps for Fault finding & Analysis.

5. Modern Appliances 10

- Working principle and block diagram of following:

  Microwave oven, Telephone, Fax machine, Printers, Scanners.
- Steps for Fault finding & Analysis.

PRACTICAL

Time: 2.5 Hours ***Marks: 50***

1. Assembly study and fault finding of an audio amplifier.
2. Assembly, study and fault finding of a graphic equaliser.
3. Study working, assembly & fault finding of Colour TV.
4. Study working, assembly & fault finding of LCD TV.
5. To trace the fault in the following panel controls and correct them:
   - Volume control.
   - Brightness control.
   - Contrast control.
   - Vertical hold control.
6. To trace the following stages of T.V. set:
   - Tuner.
   - MF stage.

- Video detector.
- Video amplifier.
- Sound I.T.
- Sound output stage.
- Syne separator.
- Vertical oscillator.
- Horizontal oscillator.
- Line Driver Stage.
- Line output transformer.
- Power supply.

7. To find fault for the following defects:
   - No picture no sound.
   - Sound present, picture missing.
   - Picture rolls vertically.
   - Picture tears (Horizontal oscillator).
   - Faults in tuner/IF/power supply.
8. Study working, assembly & fault finding of tape recorder system.
9. Study working, assembly & fault finding of CD/DVD player system.
10. Study working, assembly & fault finding of Printer.
11. Study working, assembly & fault finding of Scanner.
12. Study working, assembly & fault finding of Microwave oven.
13. Study working, assembly & fault finding of Telephone.
14. Study working, assembly & fault finding of Fax Machine.
15. Study working, assembly & fault finding of UPS system.
16. Study working, assembly & fault finding of DTH kit.

PRACTICAL GUIDELINES

Parameters	Marks
Project / Practical Activities.	10
Viva Based on Project.	10
Practical File / Report or Portfolio.	10
Demonstration of skill Competency in Lab Activities.	20
Total	**50**

CLASS–XII
GENERAL FOUNDATION COURSE (501)
(Common for Engineering & Technology Based Courses)

(Refer to page 13)

GUIDELINES FOR EXAMINERS

1. Examiner should check up at least one result of the examinee.
2. As far as possible each examinee should be given separate experiment.
3. Main emphasis should be given on the evaluation of work done, professional competency, workmanship and finish etc.
4. The object of Viva-voce should be to ascertain the depth of knowledge and understanding of the student. Questions asked should pertain to experiment performed by the student as well as other experiments.
5. Each student may be allotted two experiments from the list and he/she may perform any one out of the two.

GENERAL INSTRUCTIONS TO THE STUDENTS/CANDIDATES

Note: Before starting the practical, student should submit the connection diagram along with the list of equipment to the examiner.

1. Each student should check up the material/tools and equipments as per the requirement of the examination.
2. Each student should make himself/herself clear in understanding the question paper fully before its commencement.
3. Any student who finds any problem in handling the machine/equipment should immediately contact his/her Invigilator/Examiner.
4. Each student must do all the required operations himself/herself without the help of other students.
5. Each student should bear in mind the time allotted to him/her so that he/she may finish his/her jobs within the stipulated time.

LIST OF RECOMMENDED BOOKS

1. Electronics, A first course, Owen Bishop – Published by Elsevier Ltd.
2. Electronics for Dummies, Cathleen Shamieh and Gordon McComb – Wiley Publishing Inc.
3. Electronic Devices and Circuit , JB Gupta – SK Katatria Publications.
4. Electronic Devices and Circuit Theory 7th ed. – R. L. Boylestad, Pearson.
5. Electronic-Devices-And-Circuits-by-K-Lal-Kishore – BS Publications.
6. Electronic devices and circuits By Salivahanan, - The Mcgraw Hill Companies.
7. Electronics – Analog & Digital By IG Nagrath - PHI.
8. Semiconductor Physics and Devices: Basic Principles By D. A. Neamen, - McGraw Hill.
9. Modern Digital Electronics By RP Jain - TMH.
10. Principal of Communication Systems – Taub Schilling – TMH.
11. Modern Digital and Analog Communication System, BP Lathi – Oxford University Press.
12. Principles of Wireless Networks, Kaveh Pahlavan and Prashant Krishnamurthy.
13. Television and Video Engineering By SP Bali – TMH.
14. Consumer Electronics for Engineers By Philp Hoff – Cambridge University Press.
15. Consumer Electronics By JS Chitode – Technical Publications Pune.
16. A Beginners Guide to Consumer Electronics Repair, Douglas Kinney – iUniverse Books.
17. Portable Consumer Electronics, By Sridhar Canumalla – PennWell Corp.

LIST OF EQUIPMENTS AND INSTRUMENTS

S. No.	Description of Item
1.	Resistance - various values/sizes.
2.	Condensers - various values/sizes.
3.	Transformer such as Battery Eliminator mains and Battery charger.
4.	Side cutting insulated pliers – 15 cm.
5.	Long Nose insulated pliers 15 cm.
6.	Wire cutter, spring type.
7.	Screw driver set – 10 cm, 15 cm, 20 cm.
8.	Soldering Iron – 35 W/220 V, Solder Wire – 60, 40 and soldering Iron Stand.
9.	Tinned Copper Wire.
10.	VARIAC Single Phase.
11.	Wire Stripper.
12.	Steel Scale.
13.	Combination Pliers.
14.	Crimping Tools.
15.	Electronic Tool Kit.
16.	Analog Oscilloscope: Oscilloscope 30 Mhz Dual Trace.
17.	Digital Multimeter 4 & ½ Digits.
18.	Function Generator 0.3 Mhz To 3 Mhz.
19.	DC regulated Power Supply (30 V/5A).
20.	Frequency Counter 0.1 Hz to 1 GHz.
21.	Universal IC Tester, Digital IC upto 40 pins.
22.	Three Terminal Voltage Regulator Trainer Board.
23.	Diode & Zener diode Characteristics Trainer Board.
24.	Rectifier and Filter Trainer Board.
25.	Transistors Characteristics Trainer Board (CE,CB,CC).
26.	TV pattern Generators.
27.	Telephone Trainer Kit.
28.	Mobile Communication Training System.
29.	Communication Simulation Software.
30.	Fax machine trainer.

S. No.	Description of Item
31.	Mobile Phone Trainer.
32.	Single Phase Half Wave Control Rectifier Using SCR Board.
33.	UPS Trainer.
34.	Temperature Oven (0-200 ^{0}C).
35.	Different Microphones & Loudspeaker (for study of frequency response of microphone).
36.	Microwave Oven.
37.	Colored Television Demonstration kit.
38.	CD/DVD Player Trainer Kit.
39.	Stereo Cassette player demonstration cum trainer.
40.	Facsimile Machine.
41.	DTH System.
42.	8 bit digital multiplexer.
43.	1:8 line de-multiplexer.
44.	Multiplex two BCD numbers to seven segment display.
45.	3 bit asynchronous up-counter3 bit synchronous down counter.
46.	Universal Shift Registers having SISO, SIPO, PIPO, PISO.
47.	Encoder/decoder trainer.
48.	Digital IC Testers.
49.	Digital IC Power Supplies (+/- 5V/1A, +/-12V/1A/+-15V, 1A).
50.	GSM trainer kit.
51.	CDMA trainer kit.
52.	Digital Trainer Kit with following on board facility: Breadboard, 16 Nos. of input toggle switches, Sixteen nos. of LED output provision, Fixed +5V@1A and variable ±15V@500mA power supply, Pulser switch for clock input, Variable frequency clock signal (1Hz to1KHz), Digital voltmeter Seven segment display
53.	TTL IC 7400(NAND), 7402 (NOR), 7404(NOT), 7408(AND), 7432(OR), 7486(XOR) TTL IC 7446 (Common anode decoder driver), IC 7448 (Common cathode decoder driver), seven segment display (both common anode: MAN 3910 or equivalent and common cathode: MAN 3940 or equivalent).

S. No.	Description of Item
54.	8085 microprocessor based microprocessor trainer kit.

GEOSPATIAL TECHNOLOGY

Introduction

The term Geospatial technology is an umbrella phrase associated with a range of various technologies which include remote sensing, Global Positioning System (GPS), Geographic Information System (GIS), information technologies, and field sensors, that are intended to facilitate the process of capturing/storing/processing/displaying/disseminating information tied to a particular location.

This present course curriculum offers an opportunity for the students to understand the basics of geospatial technology for developing an interest in the principles, practical uses, and resources related to geospatial technologies. With the exponential growth of Indian geospatial market, this initiative is intended to develop the pool of manpower trained in this particular subject. This course will enable the students to get an insight into the diverse geospatial database concepts, creating and implementing of the same, GIS theory and spatial analysis, supplemented by extensive practical exercises. Also, it will help the students to acquire skills for further studies and to enter into the world as professionals.

CLASS–XI
ELECTIVE
GEOSPATIAL TECHNOLOGY (740)
THEORY

Time: 3 Hours ***Marks: 60***

Chapter–1: Geospatial Overview — 5

- Introduction to Geospatial Technology.
- Why to study Geospatial Technology.
- Importance of Geospatial Technology.

Chapter–2: Mapping & Cartography — 10

- What is Map & its Importance.
- Map Scale and Types.
- Elements of Map and Indexing.
- Map Coordinate System.
- Interpretation of Satellite Images.

Chapter–3: Remote Sensing — 20

- Overview on Remote Sensing Technology.
- Fundamentals of Remote Sensing.
- Physics of Electro Magnetic Energy.
- Remote Sensing Platforms, Sensors and Data Products.
- Remote Sensing Applications.

- Indian Remote Sensing Systems.

Chapter–4: Geographical Information System (GIS) **20**

- Fundamentals of GIS.
- Components of GIS.
- GIS Acquisition of GIS.
- Data Types of GIS.
- Application of GIS.

Chapter–5: Ground Positioning System (GPS) **5**

- Overview of GPS.
- Functions of GPS.
- Segments of GPS.
- Accuracy of GPS.
- Applications of GPS.

PRACTICAL

Time: 2 Hours ***Marks: 40***

Exercise No. 1: **5**

- To map School building and surrounding environment.

Exercise No. 2: **5**

- To display the various types of the matic geological, political.
  Meteorological and cadastral maps subject to availability.
- To read the maps and identify Map features.
- To learn usage of Maps.

Exercise No. 3: **10**

- To display two different scales of Toposheets of same area.
- To read Toposheet index and identify the adjacent Toposheets.
- To understand the small and large scale concepts.
- To compare the same area coverage by two different scaled Toposheets.
- To identify the different types of point's line and polygon features.
- To identify the map elements.
- To know the four coordinates of Topo heets.
- To learn findout the location of any point.

Exercise No. 4: **10**

- To display the satellite imagery and Toposheet of same area.
- To identify the same features from Topo sheet and Satellite image.
- Compare the identified features with toposheets and satellite image.

Exercise No. 5: **5**

- To understand the GIS environment for example open file, Display images and operate various functions such as zoon in, Zoom out, open attribute table and reading them overlay etc.

Exercise No. 6: **5**

- To Understand the GPS data collection and map them.
- Prepare table of coordinates and elevation of all points collected.
- Compare the results on Google map.

CLASS–XI
GENERAL FOUNDATION COURSE (501)
(Common for Engineering & Technology Based Courses)

(Refer to page 7)

CLASS–XII
ELECTIVE
GEOSPATIAL TECHNOLOGY (740)
THEORY

Time: 3 Hours ***Marks: 60***

Chapter–1: Remote Sensing (RS) **20**

- Introduction.
- Spectral Reflectance Signature.
- Digital Image Processing.
- Visual Interpretation of Satellite data.
- Aerial Photo and Its Interpretation.
- Advanced Remote Sensing Technologies.
- Advantages and Benefits of RS.

Chapter–2: Geographic Information System (GIS) **20**

- Introduction.
- GIS Data Element and Data Structure.
- Fundamentals of Database Concept.
- Data Input to GIS System.
- GIS Data Editing.
- Attribute Data Linking.
- Spatial and Non Spatial data Analysis.
- Map Projection and Coordinate System.
- Digital Cartography.
- Advantages and Benefits of GIS.

Chapter–3: Global Positioning System (GPS) **5**

- Introduction.
- GPS Accuracy and Accuracy factors.
- Types of GPS.
- List of Global Navigation System.
- GPS Today & Limitations of GPS.
- Uses of GPS Technology.

Chapter–4: Trends in Geospatial Technology 5

- Introduction.
- Remote Sensing Trends & Technology.
- GIS Trends & Technology.
  - (i) Web Based GIS.
  - (ii) Enterprise GIS.
  - (iii) Mobile GIS.
  - (iv) 3-D Visualization and Fly through.
  - (v) Open GIS.
- GPS Trends & Technology.

Chapter–5: Applications of Geospatial Technology 10

- Water shed Studies.
- Flood Studies.
- Ground water Studies.
- Health Issues.
- Utility Studies.
- Security and Defense Studies.
- Urban and infrastructure Studies.

PRACTICAL

Time: 2 Hours ***Marks: 40***

1. Projection of Data 5

- Georeferencing.
- Coordinating System and components.
- Image to map registration.
- Image to image registration.

2. Digitization 5

- Building Topology.

3. Digital Image Processing 5

- Image enhancement.
- Unsupervised classification.

- Supervised classification.

4. Geospatial Data Creation and Editing **5**

- Querying (Location parameters, graphics etc.).
- Projection data.
- Building geo database.

5. Spatial Analysis & Thematic Mapping **5**

- Overlay analysis
- Geoprocessing of data intersection, union dissolve, merge, clip.
- Functional attribute and expression.
- Statistics and Report generation.

6. Symbology & Layouts **5**

- Map surfing.
- Preparing map and its layout.
- Indexing.
- Scale and annotation.
- Preparing maps for presentation.

7. On Job Training **10**

- Preparation of maps for.
- Environment analysis.
- Urban area.
- Water bodies.
- Agriculture and Forest Collecting ground truth with GPS Overlaying of different maps in GIS.

CLASS–XII
GENERAL FOUNDATION COURSE (501)
(Common for Engineering & Technology Based Courses)

(Refer to page 13)

LIST OF RECOMMENDED BOOKS

1. Geospatial Technology, Practical Manual XII, published by CBSE.
2. Geospatial Technology, Teachers Manual XI, published by CBSE.
3. Geospatial Technology, Teachers Manual XII, published by CBSE.
4. Geospatial Technology, Text Book XI, published by CBSE.
5. Geospatial Technology, Text Book XII, published by CBSE.
6. Applications of Geospatial Technology, Ganesh, A.

7. Introduction To Geospatial Technologies, by Bradley Shellito.

SUGGESTED LIST OF EQUIPMENTS AND TOOLS

S. No.	Name of article	Quantity
1.	Currycombs.	10 nos.
2.	Stiff brushes.	10 nos.
3.	Computer lab with internet connection.	
4.	Computers with installed Geometrical Software.	6 nos.

FOUNDRY TECHNOLOGY

Objectives

This course aims to introduce students to the foundry industry and provide clear understanding to the students of the technology processes, design flow and the techniques that can be employed to realize effective designs using our latest toolkits. The student will learn about foundry drawing, molding techniques, raw materials used, melting and pouring and cast metal techniques and so on. This course aims to develop appropriate technical knowledge as well as the professional skills of the students, so that they are equipped to take gainful employment in the said vocation.

CLASS–XI
ELECTIVE
FOUNDRY TECHNOLOGY (755)
THEORY

Time: 3 Hours ***Marks: 60***

Unit–1: Introduction, Scope and Overview of Foundry Technology 5

- Introduction to Metal Casting - its role, advantages and applications as a manufacturing process, historical development, usage of cast items, raw materials required.
- Introduction to engineering metals and alloys used for casting – cast irons, cast steels, copper and aluminium alloys.
- Type of foundry, Foundry industry in India – status and growth prospects.

Unit–2: Pattern-Making and Usage of Patterns 15

- Steps in foundry operations, role and importance of patterns.
- Elements of Engineering drawing – basic concepts, plan , elevation, isometric and sections.
- Types of pattern, pattern materials, various pattern allowances and other design considerations, pattern selection according to job order, pattern layout.
- Parting lines, core boxes, tools required in pattern making, colour codes.

Unit–3: Raw Materials for Sand Moulding and Core Making 10

- Types of sand and their characteristics, influence of sand on properties of mould and castings.
- Moulding and core sands – desired properties, binders and additives and their functions and how to obtain optimum properties.
- Preparation of moulding and core sands – equipment used, mullers and mixers, quality control aspects.

Unit–4: Mould Making, Core Making 20

- Conventional sand moulding – steps involved, parting line selection, green and dry sand moulding, loam sand moulding, moulding processes.
- Sand moulding with various types of organic binders, selection of binders and special care required, Core making use of inorganic and organic binders.
- Equipment required in moulding and core making – brief description, comparison and application, use of mould and core paints.

- Testing of moulding sand, mould inspection and testing.

Unit–5: Feeding of Castings **10**

- Introduction to Melting process and Melting furnace.
- Feeding system in a mould, their functions, Pouring basin and Sprue-basic requirements of design, Gating system – types, location of runners, ingates.
- Risers- types, functions of a riser, location, Methods of riser design- concept of Modulus, solidification time, use of Chill, exothermic compounds etc., possible casting defects due to improper feeding and precautions required.

PRACTICAL

Time: 2 Hours ***Marks: 40***

Exercise No. 1: **5**

- Line drawing, dimensioning, Geometrical construction.
- Section of solids, Isometric and Orthographic views.

Exercise No. 2: **15**

- Visit to a foundry, Layout of foundry, Report on equipment used, raw materials consumed, types of moulds, quality control aspects etc.
- Pattern layout.
- Calculation of shrinkage allowances.
- Drawing Isometric, Plan and Elevation views from an actual pattern.
- Locating sprue, runner and riser, Calculation of riser volume.

Exercise No. 3: **15**

- Sand testing – Shape and size of sand, AFS Sieve analysis of sand, clay content.
- Preparation of moulding sand and standard specimen, Permeability, Hardness determination, tests for Green strength, Dry strength, moisture content.
- Optimisation of binder and water content by variation of binder and water level.

Exercise No. 4: **5**

- Preparation of a green sand mould with a simple pattern, use of mould coating.
- Measurement of mould hardness.

CLASS–XI
GENERAL FOUNDATION COURSE (501)
(Common for Engineering & Technology Based Courses)

(Refer to page 7)

CLASS–XII
ELECTIVE
FOUNDRY TECHNOLOGY (755)
THEORY

Time: 3 Hours ***Marks: 60***

Unit–1: Special Moulding and Casting Processes 15

- Moulding processes with permanent moulds, Die casting processes, basic features of die design, equipment description, selection, pressure die casting, gravity die casting, cast products, protection of dies.
- Centrifugal casting processes – Description of true and semi centrifugal casting products and specific application areas, Centrifuging.
- Shell moulding, Investment casting and other precision casting processes.

Unit–2: Melting and Pouring Practice 10

- Classification of melting furnaces used in Foundry, Selection of melting furnaces, essential features of a melting furnace , Refractory materials – types, properties and application.
- Cupola melting - Cupola furnace: types of cupola- divided blast, hot blast, oil fired, coke less etc., brief description of design, operation and quality control aspects, charge calculation.
- Furnaces heated by electricity - Resistance, Arc and Induction furnaces various types, brief description and application and merits of each.
- Influence of melting and pouring practice on casting quality, shop floor tests for quality assurance.
- Solidification: Nucleation and growth.

Unit–3: Production Practice for Ferrous and Non-Ferrous Metals 15

- Important aspects of foundry practice for castings of Cast irons – grey, malleable and ductile irons, modularizing treatment.
- Steel foundry practice, practice and quality control in moulding, melting and pouring for production of carbon and alloy steel castings, High – manganese and Stainless steel castings, finishing operations and safety aspects.
- Foundry practice for copper and aluminium alloys, melting and pouring practice, degassing and dross removal, precautions required.

Unit–4: Cast Metals Technology 10

- Solidification of pure metal and alloys. Basic concepts of structure of pure metals, cast metals and alloys, hardness and tensile properties.
- Cast Irons - types, forms of graphite in cast irons, Alloy Cast irons-effect of alloying elements on properties, applications of Cast Iron.
- Cast steels- plain carbon and alloy steels – properties and applications.
- Properties and applications of important cast non-ferrous alloys

Unit–5: Testing and Quality Assurance in Foundry 10

- Cleaning of castings: knockout, fettling, shot blasting and grinding of casting components.
- Hardness tests and Tensile tests of castings, Non-destructive tests of castings.
- Casting defects: Causes and remedial measures.

PRACTICAL

Time: 2 Hours *Marks: 40*

Exercise No. 1: **10**

- Visit to a foundry, layout of foundry shop, report on casting quality control, and diagnosis of casting defects castings components.

Exercise No. 2: **10**

- Moulding practice in foundry.

Exercise No. 3: **10**

- Melting furnaces in the foundry.

Exercise No. 4: **5**

- Laboratory demonstration of melting and solidification.

Exercise No. 5: **5**

- Mechanical testing of castings.

CLASS–XII
GENERAL FOUNDATION COURSE (501)
(Common for Engineering & Technology Based Courses)

(Refer to page 13)

LIST OF RECOMMENDED BOOKS

1. Foundry Technology I, Theory XI, published by CBSE.
2. Foundry Technology I, Practical XI, published by CBSE.
3. Foundry Technology II, Theory XII, published by CBSE.
4. Foundry Technology II, Practical XII, published by CBSE.
5. Principles of Foundry Technology, P.L Jain, Tata McGraw- Hill Education.
6. Metal Casting: Principles And Practice, T.V. Rammana Rao, New Age International.
7. Foundry Tehnology, O.P. Khanna, Dhanpat Rai Publications Private Limited.
8. Foundry Tehnology, Peter Beeley, idea international publishers.
9. Manufacturing Technology, Vol. I: Foundry, Forming and Welding (Third Edition), P. N. Rao, Book Vistas.

LIST OF SUGGESTED EQUIPMENTS

1. Electronic Balance.
2. Drying Oven.
3. Melting furnace(Resistance Furnace).
4. Universal testing machine for sand sample.
5. Sand Rammer.
6. Glass Bicker.
7. Measuring Flask.
8. Mold Box.

9. Chisel.
10. Venting Rod.
11. Trowel.
12. Gagger.
13. Pattern.
14. Core Box.
15. Mold Hardness Tester.
16. Clay Washer.
17. Follow Board.
18. Sand Muller.
19. Sand Mixer.
20. Hand Riddle.
21. Sieve Shaker.
22. Shovel.
23. Draw Spike.
24. Lifter.
25. Permeability Tester.
26. Sand Rammer for Specimen Preparation.
27. Medium to large crucible.
28. Large plastic or metal container with lid.
29. Fine metal mesh screen.
30. Trowel and fine brush.
31. Molding box with gating system and casting components.
32. Small item to be used as a model for the molding.
33. Slag stick and metal Pliers.
34. Wooden or metal rammer.

RAW MATERIALS

1. Silica Sand.
2. Zircon Sand.
3. Chamotte Sand.
4. Powdered Bentonite clay.
5. Dextrin.
6. Soap stone powder.
7. Sodium silicate.
8. CO_2 gas.
9. Resin Coated Sand.
10. Aluminium ingots for casting.
11. Copper ingots for casting.
12. Commercial grade tin.
13. Wax.

TRANSPORT SYSTEMS AND LOGISTIC MANAGEMENT

Objective

This course intends to introduce students to the world of transport management. The curriculum aims to skill students in understanding and utilizing measurable criteria to evaluate how well the multimodal transportation system operates. Identify and address the impacts of freight movement on areas surrounding truck routes (noise, air quality, safety). Identify and reduce/eliminate freight linkage deficiencies with the objective of improving freight movement through roadways, railroads, and rivers.

CLASS–XI
ELECTIVE
FUNDAMENTALS OF TRANSPORTATION SYSTEMS (749)
THEORY

Time: 3 Hours ***Marks: 60***

Unit–1: Transportation System 12

- National Transport Policy.
- Fundamentals of Transportation Systems.
- Importance of transportation for the development of a country.
- Different forms of transportation and their advantages and disadvantages (roads, railways, airports, waterways, pipelines).

Unit–2: Road Transport 15

- What is Road Transport.
- Road transportation development in India.
- Functional classification of roads.
- Physical specifications of roads and highways, General knowledge of National Highway, State Highways, Check Posts & Toll Tax.
- Various modes of Road Transport.

Unit–3: Railway Transportation System 15

- History and general features of Indian Railway.
- Organization of Indian Railways.
- Classification of railway lines in India, Major railway cargo corridors.
- Categorization of cargo and passenger trains.
- Modernization of railways and high speed trains & Dedicated Freight Corridor.
- Cargo movement through Container.
- Specifications of Rail Coaches & Wagons, Indian Railway Assets, etc.
- Private Container train operators.

Unit–4: Air Transportation 8

- Air transportation, Development of air transportation in India and trends in air traffic.
- Airport classifications.
- Different components of airports: runway, taxiway, apron and passenger and cargo handling areas.
- Brief of Major Airports in the country.

Unit–5: Water and Pipeline Transportation **10**

- Water transportation, Historical development of ports, harbours and docks.
- Inland waterways: National Waterway and their functions.
- Coastal water transport: type of cargo.
- Pipeline transportation.

PRACTICAL

Time: 2 Hours ***Marks: 40***

Prepare a Project on:

1. Development and growth of Road transportation in India. **6**
2. Development and growth of Rail transportation in India. **7**
3. Development and growth of Air transportation in India. **7**
4. Development and growth of Water ways transportation in India. **7**
5. Development and growth of pipeline transportation in India. **7**
6. Modes of Transportation. **6**

CLASS–XI
ELECTIVE
LOGISTICS, OPERATIONS AND SUPPLY CHAIN MANAGEMENT (750)
THEORY

Time: 3 Hours ***Marks: 60***

Unit–1: Elements of Logistic, Operations and Supply Chain Management **10**

- Definition of Logistics.
- Evolution of Logistics & Logistic Functions, Need for Logistics.
- Concept of:
  - (i) Ware house, its types and functions.
  - (i) IBL.
  - (iii) OBL.
  - (iv) Inventory Management.
  - (v) Supply Chain Management.
  - (vi) Refrigerator & cold chain container movement.

Unit–2: Multimodal Transport System **10**

- Multi modal transport-features of multi-modal transport system, advantages.

- Types of intermodal movements.
- intermodal relationships; multimodal carriers.
- international movements.

Unit–3: Freight Management and Material Handling **14**

- Logistic Transport Operation (Network Planning, Route Management, Hub & Spoke system).
- Freight Management and Cost.
- Material Storage and Safety Methods.
- Stacking of goods, loading, unloading & handling of goods.

Unit–4: Safety in Transportation and Traffic Regulation **13**

- Safety in Transportation.
- Accidents in the air: probable causes, navigation aids, landing categories.
- Railway accidents and disaster management: classification of accidents, derailment and its causes, safety measures, disaster management.
- Road accidents: reasons and possible mitigation measures.
  - (i) Safe Cargo Movement Practice.
  - (ii) Safety Storage.
  - (iii) Disaster Management.
  - (iv) Accident Management.
- Traffic Management & Regulation.

Unit–5: ISO in Logistics and Occupational Hazards **13**

- ISO in Logistic.
- Quality.
- Environment.
- Occupational Hazards and Safety.

PRACTICAL

Time: 2 Hours ***Marks: 40***

1. Case Study on an overall logistic Operation of an Organization. **20**
2. Project on Company's logistics operation. **20**

CLASS–XI
GENERAL FOUNDATION COURSE (501)
(Common for Engineering & Technology Based Courses)

(Refer to page 7)

CLASS–XII
ELECTIVE
INTEGRATED TRANSPORT OPERATIONS (749)
THEORY

Time: 3 Hours ***Marks: 60***

Unit–1: Transport Operations-I — 18

- Structure of Transport organization and types (National, Regional, Local).
- Procedure for Booking consignments.
- Transhipment procedure (Hub & Spoke System).
- Goods Receiving Procedure.
- Goods Forwarding Procedure.
- Delivery Procedure.
- Documentation.

Unit–2: Transport Operations-II — 12

- Lorry hire systems.
- Fleet Operation, maintenance, fleet utilization.
- Billing Procedure.
- Tendering Process.
- Quotation to Customers.

Unit–3: Warehouse Management — 10

- Loading, Unloading & Handling of goods in warehouse.
- Stacking of goods.
- Retrieval of material.
- Warehouse activities kitting, binning etc.
- Documentation in warehouse activities.
- Importance of Security & Fire Safety at warehouse.

Unit–4: Freight Rates/Costing Methods — 12

- Road Freight.
- Rail freight.
- Air freight.
- Sea Freight.
- Waterways & Coastal Freight.

Unit–5: Brief Notes & Importance — 8

- Consignment note.
- Sales Tax forms.
- Check Post& Toll Tax procedures.

- Goods forwarding note.
- Weightment, Dimensional cargo.
- Lorry hire contract.
- Trip sheet.
- CBS.
- Route Permit.
- Truck Registration.
- Insurance.

PRACTICAL

Time: 2 Hours ***Marks: 40***

Documentation

1.	Forwarding note.	**6**
2.	Consignment Note.	**6**
3.	Types of consignment – ODC / FTL / Part / Parcel.	**8**
4.	Weighment of goods.	**7**
5.	Marking of goods.	**6**
6.	Preparation of lorry hire contract.	**7**

CLASS–XII
ELECTIVE
LOGISTICS, OPERATIONS AND SUPPLY CHAIN MANAGEMENT (750)

THEORY

Time: 3 Hours ***Marks: 60***

Unit–1: Logistics and System Concept, Objectives and Role of Logistics **10**

- Logistics and System concept - Information flow, warehousing, inventory control, packaging, transportation.
- Objectives of logistics management.
- Role of logistics in supply chain.
- 3 PL & 4 PL Logistics.
- Careers & growth in Logistics and Supply Chain.

Unit–2: Inventory Management **15**

- Inventory management and supply chain.
- Inventory functions and cost.
- Inventory related cost.
- Functions of Inventory management in supply chain operations.

Unit–3: Freight Management 10

- Freight Management - factors influencing freight cost, route planning.
- Packaging for safe product handling and in Logistic Operations.
- Containerization - its scope and types, its uses.

Unit–4: Logistic Management and Information Technology 15

- Logistics operation and Information technology - New trends - GPRS, RFID, Bar code, Radio Frequency Tag (RFT), E -commerce.
- Documentation for domestic and international trade cargoes, International Chamber of Commerce Terms.
- Sea borne trade - Ports and Ships management in India.
- Logistics and Supply Chain uses in World Industry.

Unit–5: Emerging Issues in SCM and Logistics 10

- Statutory Provisions dealing transport – Multi modal Transport Act-1993.
- Motor Vehicles Act 1988 - driving rules.
- Insurance coverage - Marine insurance, road, rail, sea, air etc.
- Insurance Claims.

PRACTICAL

Time: 2 Hours ***Marks: 40***

Preparation of Different Documents used in –

1. Domestic cargoes. **20**
2. International cargoes. **20**

CLASS–XII

GENERAL FOUNDATION COURSE (501)

(Common for Engineering & Technology Based Courses)

(Refer to page 13)

LIST OF RECOMMENDED BOOKS

1. Fundamentals of Transportation System XI, Published by CBSE.
2. Logistics, Operations and Supply Chain Management-I, Published by CBSE.
3. Logistics, Operations and Supply Chain Management-I, Teacher's Manual, Published by CBSE.
4. Integrated Transport Operations, Class XII, Published by CBSE.
5. Logistics, Operations and Supply Chain Management, Class XII, Published by CBSE.
6. Jotin Khisty C and Kent Lall B, Transportation Engineering: An Introduction; Prentice Hall International, Inc, 1998.
7. Hutchinson B.G, Principles of Urban Transport Systems Planning McGraw Hill Book Company (latest edition).

8. Kanafani Adib, Transportation Demand Analysis, McGraw-Hill Book Company (latest edition).
9. Papacostas C.S and Prevedouros, Transportation Engineering & Planning; Prentice- Hall of India Pvt. Ltd. (Third edition).
10. Bruton M.J, Introduction to Transportation Planning, Hutchinson of London (Latest Edition).

LIST OF EQUIPMENTS

1. Geographical charts.
2. Atlas.

IT APPLICATION

Introduction to Computer Applications

A. Preamble

Computer is now affecting energy sphere of human activity. It is instrumental in bringing revolutionary changes in industry, scientific research and education. This is not only the demand of time but also the demand of almost each and every subject to have an associated computer learning to equip a student with start-of-art technology to prove himself/herself a better candidate than those without computer knowledge.

Since the CBSE has been foremost in giving best to its clientele, a single paper as per requirement of industry has been designed in such a way that it can be taken as an independent subject along with any combination of vocational packages.

This paper has been designed keeping in view the need and demand of computer industry.

B. Objectives

The course is designed to fulfill the following objectives:–

- Familiarisation with computer-dominated technological world.
- To impart adequate know how to the students to be able to take up entry level jobs in the area of Data Processing.
- Exposure of utility and applications of computers.
- To get acquaintance with the basics of Computer Science and lay foundation for higher education/careers in computers in conformance with industry requirements.
- Application of computers in the specific areas such as accounting & auditing, stores accounting, office management & secretarial practice, textile designing etc.
- Algorithmic approach to problem solving.
- To use computer effectively and efficiently by acquiring working knowledge of PC softwares.
- Familiarisation with Data Processing environment and Data Processing terminology.

C. Career Opportunities

- Field Service Technician.
- IT Support Specialist.
- Executive (Web Development).
- Data Processing Assistant/Documentation Assistant.
- Programming Assistant.

The rapid changes in the area of Information Technology have significantly affected the fields of business, finance, trade, governance and communications which have not only resulted in global competitiveness in various fields but simultaneously have pushed the global technical advancements. The feasibility of easy access to information, data processing and modes of communication has made visible changes in the modes of administration at all levels. Due to the increasing demands for a deeper understanding of information technology, computer aided learning has necessitated curricular reforms incorporating basic competency and skills in the fields of information technology.

The course intends to develop skills related to web applications and advanced web designing. Knowledge of network safety and security, digital designing, multimedia anchoring, web content creation, interactive web page creating and troubleshooting will be imparted. The curriculum is designed to develop appropriate technical knowledge as well as the professional skills of the students, so that they are equipped to take gainful employment in the said vocation.

CLASS–XI
ELECTIVE
IT TOOLS (795)
THEORY

Time: 2.5 Hours ***Marks: 50***

Unit Code	Unit Title	Total Hours	Total Marks
ITDC–301	Computer Organization & OS: User perspective. ❯ Understanding of Hardware. ❯ Basics of Operating System.	15	8
ITDC–302	Networking and Internet. ❯ Network Safety concerns. ❯ Network Security tools and services. ❯ Cyber Security. ❯ Safe practices on Social networking.	10	7
ITDC–303	Office automation tools: ❯ Spreadsheet. ❯ Word processing. ❯ Presentation.	40	10
ITDC–304	Multi Media Design: (Open Source Design Tools). ❯ Interface and Drawing Tools in GIMP. ❯ Applying Filters. ❯ Creating and handling multiple layers. ❯ Using Stamping and Smudging tools. ❯ Importing pictures.	35	10
ITDC–305	Troubleshooting: Hardware, Software and Networking. ❯ Commonly encountered problems. ❯ (Monitor: No display, KB/Mouse not responding, monitor giving beeps, printer not responding, check for virus, Delete temporary files if system is slow, adjust mouse speed).	10	7
ITDC–306	Work Integrated Learning IT – **ISM** ❯ Identification of Work Areas. ❯ Work Experience.	14	8
		124	**50**

PRACTICAL

Time: 2.5 Hours ***Marks: 50***

Details	Marks Distribution
Programs / Practical Questions. ❯ Spreadsheets, Word, Presentation (10 Marks). ❯ Multimedia Design (10 Marks). ❯ Troubleshooting (5 Marks).	30
Project / Practical File	10
Viva Voce	10
Total	**50**

CLASS–XI
ELECTIVE
WEB APPLICATIONS (796)
THEORY

Time: 2.5 Hours ***Marks: 50***

Unit Code	Unit Title	Total Hours	Total Marks
ITDC–310	Multimedia Authoring- Animation Tools. ❯ Animation Concepts. ❯ Frames and Layers. ❯ Motion and Shape, Tweening. ❯ Importing AV Files. ❯ Publishing.	30	15
ITDC–311	Digital Content Creation- Adding Styles to Web Pages (CSS). ❯ Review of HTML. ❯ Adding Style Sheets. ❯ External style sheets. ❯ CSS Properties – border, box, font, margin, padding. CSS classes.	30	10
ITDC–312	Web Scripting- JavaScript. ❯ Creating interactive Web Pages with scripts. ❯ Variables and Operators. ❯ Decision making using if and switch. ❯ Iterations - loops. ❯ Window Object. ❯ Location Object. ❯ History Object. ❯ Popup Boxes – alert, confirm.	50	15
ITDC–313	Work Integrated Learning IT – **WA-I.** ❯ Identification of Work Areas. ❯ Work Experience.	14	10
		124	**50**

PRACTICAL

Time: 2.5 Hours ***Marks: 50***

Details	Marks Distribution
Programs / Practical Questions. ❯ Animation Tools (15 Marks). ❯ HTML (10 Marks). ❯ Web Scripting - Java Script (5 Marks).	30
Project / Practical File	10
Viva Voce	10
Total	**50**

CLASS–XI
GENERAL FOUNDATION COURSE (501)
(Common for Engineering & Technology Based Courses)

(Refer to page 7)

CLASS–XII
ELECTIVE
DATABASE MANAGEMENT APPLICATIONS (795)
THEORY

Time: 2.5 Hours ***Marks: 50***

Unit Code	Unit Title	Total Hours	Total Marks
ITDC–401	Database Concepts – RDBMS Tool. ❯ Basics of RDBMS. ❯ SQL – Creating and Opening Database. ❯ Creating and populating tables. ❯ Modifying the content and structure of table. ❯ Ordering and Grouping. ❯ Operating with multiple tables.	50	10
ITDC–402	Operating Web Based Applications. ❯ Online Reservation Systems. ❯ E-Governance. ❯ Online Shopping and Bill payments. ❯ Online Tutorials and Tests. ❯ Project Management – Web Based Application development. ❯ Project essentials and tips. ❯ Case Study - Online Game. ❯ Case Study - Online Quiz. ❯ Case Study – Online Bill Calculator.	30	15
ITDC–403	Fundamentals of Java programming, Introduction to Java, Object Oriented Programming, Java Language Elements, Operators, Control Flow, Array, Class Design, Exception Handling, Assertions, Threads , Wrapper Classes, String Manipulation.	30	15
ITDC–404	Work Integrated Learning IT – DMA. ❯ Identification of Work Areas. ❯ Work Experience.	14	10
		124	**50**

PRACTICAL

Time: 2.5 Hours ***Marks: 50***

Details	Marks Distribution
Programs / Practical Questions. ❯ SQL Queries (15 Marks). ❯ JAVA Programs (10 Marks).	30

) Operating Web Based Application (5 Marks).	
Project / Practical File	10
Viva Voce	10
Total	**50**

CLASS–XII
ELECTIVE
WEB APPLICATONS (796)
THEORY

Time: 2.5 Hours ***Marks: 50***

Unit Code	Unit Title	Total Hours	Total Marks
ITDC–410	Movie Editing Tools.) Familiarization of interface components.) Importing pictures.) Importing Audio and Video Files.) Splitting and Joining Movie Clips.) Adding Titles and publishing.	30	10
ITDC–411	Customizing and Embedding Multimedia components in Web Pages.) Compatible Multimedia file formats for Web Pages.) Embedding Audio file.) Embedding Video file.) Embedding Flash file.	40	15
ITDC–412	Web Scripting – Java Script.) Java Script review.) Functions – user defined.) String Object.) Math Object.) Array Object.) Events.) Case Studies.	30	15
ITDC–413	Work Integrated Learning IT – WA-II.) Advanced Features of Web Design.) Code view, Add-ins / Snippets and Page Transitions.) Dynamic Web templates.) SEO - Search Engine Optimization.) Forms - Advanced.) Publishing webpages or websites-I.) Publishing webpages or websites-II.) Authoring tools.) CSS templates.	24	10
		124	**50**

PRACTICAL

Time: 2.5 Hours ***Marks: 50***

Details	Marks Distribution
Programs / Practical Questions. - Movie Editing Tools (15 Marks). - Customizing and Embedding, Multimedia Components in Web Pages (10 Marks). - Web Scripting - Java Script (5 Marks).	30
Project / Practical File	10
Viva Voce	10
Total	**50**

CLASS–XII

GENERAL FOUNDATION COURSE (501)

(Common for Engineering & Technology Based Courses)

(Refer to page 13)

LIST OF RECOMMENDED BOOKS

1. Information Technology (IT) Student Handbook for level I, Published by CBSE.
2. IT Tools, Student Handbook, Level–III by CBSE.
3. Web Application–I, Student Handbook, Level–III by CBSE.
4. Database Management Application, Level–IV by CBSE.
5. Web Application–II, Student Handbook, Level–IV by CBSE.
6. Database Systems: Design, Implementation And Management by Peter Rob, Carlos Coronel.
7. Introduction to Information Technology by Efraim Turban (Author), R. Kelly Rainer (Author), Richard E. Potter (Author).
8. Introduction to Information Technology by ITL Education Solutions Limited.
9. JavaScript, A Beginner's Guide by McGraw-Hill Osborne Media, 2009.
10. HTML and CSS: Design and Build Websites by Wiley (ISBN-10: 1118008189, ISBN-13: 978-1118008188), 2011.
11. The Book of GIMP: A Complete Guide to Nearly Everything by No Starch Press (ISBN-10: 1593273835, ISBN-13: 978-1593273835), 2013.
12. GIMP for absolute beginners by A press Publishers (ISBN-10: 1430231688, ISBN-13: 978-1430231684), 2013.
13. Microsoft Windows Movie Maker For Dummies by Keith Underdahl.
14. Getting Start ED with Windows Live Movie Maker by James Floyd Kelly.
15. Microsoft Windows Movie Maker 2 by Jan Ozer.
16. Microsoft Windows Movie Maker Handbook (Book & CD-ROM) by Bill Birney.
17. Filmmaking For Dummies by Bryan Michael Stoller.

LIST OF EQUIPMENTS/TOOLS

Batch Size: 25 Students

1. Hardware
   a) Computers : 25
   b) Printers : 2
2. Internet Connection
3. Software
   (a) Microsoft Office / Open Office
      (i) Word Processing
      (ii) Spread Sheet
      (iii) Digital Presentation
      (iv) MS Access
   (b) Internet Browser
   (c) Java SDK
   (d) Database Software
   (e) Movie editing tools
4. UPS/ Power Backup
5. Storage Media (Pen Drive / CDs)

Annexure–1

APPLICATION FORMAT FOR OFFERING VOCATIONAL SUBJECT / COURSES AT SENIOR SECONDARY LEVEL

1. **Name of the Course(s) applied for:** .....
   (with subject codes) .....
   .....
   .....

2. **Name of the School (Complete address)** .....
   (Also provide Website address if available) .....
   .....
   .....

3. **Affiliation No.** .....
4. **School ID.** .....
5. **Name of the Principal** .....
   - Phone No. .....
   - Mobile No. .....
   - E-mail .....
6. **Infrastructure** .....
   No. of Students .....
   No. of Teachers .....
   Student-Teacher Ratio .....
   No. of Classrooms .....
   Books in Library .....
   Total Computers in Computers Labs .....
   Specification of Computers .....
   Details of Constructed area for .....
   Establishing Laboratories .....
7. **Name of Teachers for Vocational Course** .....
   (Qualifications) .....
   .....
   .....
8. **Details of Draft** (in favour of **Secretary, CBSE,** Payable at Delhi)
   DD No.: ..... Date: ..... **Amount** (in Digits)
   .....
   Bank Issues: ..... **Amount** (in Words)
   .....

Signature & Seal of the Principal

Note: The document complete in all respects may be sent to: **The Director (Vocational Education), Central Board of Secondary Education 2, Community Center, Preet Vihar, New Delhi-110092.**

SENIOR SCHOOL

CURRICULUM

2016-17

VOLUME-IV
(PART-3)

Health and
Wellness Based Courses

CENTRAL BOARD OF SECONDARY EDUCATION
"SHIKSHA KENDRA", 2, COMMUNITY CENTRE, PREET VIHAR, DELHI – 110 301"

HEALTH AND WELLNESS BASED COURSES

1. Ophthalmic Techniques
2. Medical Laboratory Technology
3. Auxiliary Nursing & Midwifery
4. X–Ray Technician
5. Health Care Science
6. Health And Beauty Studies
7. Beauty Services
8. Medical Diagnostics

OPHTHALMIC TECHNIQUES

CLASS–XI
ELECTIVE
OPTICS (658)
THEORY

Time: 2 Hours ***Marks: 30***

1. The Propagation of Light Introductory 3

Rectilinear propagation of light, Pencils and Beams, Vergence, Pin-hole Camera, Shadow & Eclipse, the nature of White Light.

2. The Behaviour of Light on Reaching a New Medium 3

Reflection, Regular & Diffused, Laws of Reflection, Absorption & Transmission, Refractive.

Index, Laws of Refraction, Principle of Least Time, The Fundamental Laws of Geometrical Optics.

3. Reflection of Light of Plane Surfaces 3

Reflection, diffusion, regular reflection, experimental verification, principle of reversibility of light, Image due to a plane mirror, Image of finite object, optical image, location of images formed by a plane mirror, experimental verification, Image formed by inclined mirrors, parallel mirrors, Multiple images formed by a thick plane mirror, Application of inclined mirrors.

4. Reflection of Light on Spherical Surfaces 4

Spherical mirrors, definition of some important terms to show that focal length is half of the radius of curvature, Focal plane rule for sights, Images as any point object on the Principal axes, concave mirror, convex mirror, graphical construction of images, Relation between v.f. for a concave mirror and a convex mirror, Magnification, Images produced by a concave mirror when the object is placed in different position, Images produced by a convex mirror, when the object is placed on any point between its pole and infinity, summary of the result, parallax optical bench, Determination, of focal length of concave and convex mirrors, Distinction between the three types of mirrors, practical uses of mirrors, spherical alternation, parabolic mirror.

5. Refraction of Light on Plane Surfaces 5

Refraction experiment to show the bending of light rays on entering medium of different densities some simple experiments to show refraction of light, laws of refraction, courses of refraction, Experimental verification of the laws of refraction of lights, lateral displacement, refraction through several media of different refractive indices. Formation of image due to refraction of a plane surface, Determination of refractive index by travelling microscope, Determination of refractive index of a liquid by a concave mirror, some natural phenomenal due to refraction, Total internal Reflection, Reflection, Refraction indices of some substances with respect to air sodium-D line (589×10^{-8}) cm, Refraction of light through a prism, Angle of minimum deviation, Determination of the refractive index of the material of the prism.

6. Refraction of Light at Spherical (Lenses) 3

Spherical refraction surface, refraction at a convex surface and a concave surface, lenses, radii of curvature, principal axis, optical centre, principal focus, Focal length, principal section, Aperture, Focal, length of single spherical surface, refraction at the low surfaces of lens, Graphical constructions of images, conventions of sight, relation between object distance, images distance and focal length, Magnification, combination of lenses, power of a lens, Images produces by a concave lens when the objects is placed on any point between the optical centre and infinity, summary of results, conjugate focal length of lens, Determination of focal length of convex lens, Determination of focal length of concave lens, Distinction between the two types of lenses.

7. Optical Instruments 3

Photographic camera, the human eye, Comparison between the eye and photographic camera, defect of vision, the advantage of two eyes (Binocular vision), Three dimentional pictures (Steroscope), Three dimensional Motion pictures, Persistance of vision, Microscope, Astronomical and the Galilian telescope, the opera glass as simple binoculars, prism binoculars, Reflecting telescope, Advantages of refracting telescopes, periscope, projection lantern, Film strip projector, photographic enlarger, the episcope and apidiscope, cinematography.

8. Analysis and Synthesis of Light-Colour 3

Analysis of light by prism, synthesis of light, pure spectrum by spectrometer, the base of spectrometer, Emission and absorption spectores substances, Fraunhofer lincs, Spectrum Analysis, Invisible Spectra, Dispersive power of a prism glass, dispersion without deviation, Directive, Spectroscope, Chromatic aberration lenses an dits correction, Primary, Secondary and Complementary colours, Colours of transparent bodies, Colour of opaque bodies, colour mixed pigment, colour phenomenon in nature, the rainbow.

9. Nature of Light Interference 3

Early theories of light, objection of wave theory, the phenomenon of reflection as explained by Corpuscular theory of light the phenomenon of refraction as explained by wave theory of light.

PRACTICAL

Time: 3 Hours ***Marks: 70***

1.	To study the position and nature of images formed by a concave mirror as the object distance is changed.	**3**
2.	To study the position and nature of images formed by a lens as the object distance is changed.	**3**
3.	To determine the focal length of the concave mirror by two pin method.	**5**
4.	To determine the focal length of the convex lens by two pin method.	**3**
5.	To verify the laws of refraction and find out the refractive Index of the glass.	**5**
6.	To draw the ray diagram through prism and to prove (A+D) = (i+e).	**5**
7.	To determine the angle of prism by spectrometer.	**3**
8.	To determine the refractive index of prism by spectrometer.	**3**
9.	To determine the wave length of light using diffraction grating by Spectrometer.	**5**
10.	To compare the intensities of two sources by photometer.	**5**
11.	To determine the mechanical advantage and efficiency of an inclined plane and pulley system.	**5**
12.	To determine the unknown weight of a body using principle of moments.	**5**
13.	To determine the Specific gravity of a liquid by Specific gravity bottle.	**5**
14.	To determine the Specific gravity of a lead shots with the help of a specific gravity bottle.	**5**
15.	To determine the Specific heat of a solid (lead shots) by the method of mixture.	**5**
16.	To determine the latent heat of fusion of ice.	**5**

CLASS–XI
ELECTIVE
OPHTHALMIC TECHNIQUES (659)
THEORY

Time: 2 Hours ***Marks: 30***

1. Prism — 2

Path of light through a prism, Total reflection on a prism, Minimum deviation, normal incidence & emergence, Opthalmic prism, Images seen through prism, Refractometer.

2. Curvature Refraction at a Curved Surface — 2

Curvature: Measurement of curvature, Spherical aberration, paraxial rays, Refraction at a spherical surface (change of vergence) conjugate foci, focal length, images of object when point is not on axis, Image of a distant object.

3. Thin Lenses — 2

Form of lenses, Refraction by lenses, Focal power Conjugate foci & principal foci, Focal length, Chromatic aberrations, Image of extra-axial points, Object of finite size, Lateral magnification, Magnification of imgages in direction of axis, prismatic effects of a lens, Systems of two or more lenses, Effective power of a lens, Measurement of focal length & power with different methods.

4. Reflection at Curved Surfaces — 2

Introduction, Focal power, Measurement of focal power & focal length, Measurement of curvature of surfaces of lens.

5. Cylindrical & Sphero Cylindrical lenses — 2

Introduction, cylindrical surface, Refraction by cylindrical lens, Rotation test, Spherocylindrical lences, Refraction by spherocylindrical lens, Astigmatic beam (Sturm's conoid), Image of object to finite size.

6. Toric Lenses — 2

Transposition of toric lenses, Neutralization & marking of spherocylindrical lenses, Manufacturing limits, Baslicurve, Choice of lens form, Axis rotation, Optical prescription, Axis setting.

7. Ophthalmic Prism — 2

Vision through a prism, prism action, Measurement of prism deviation, the tangent a scale, Prism dioptre & degree of deviation, Prism power, Testing of prism, Effect of prisms on the eye, Meter angle, Compounding and resolving of prisms, Rotary prisms, Aberration of prism.

8. Decentration — 2

Lens as a series of prism, Power & prismatic effect, Marking of decentered spherical lenses, Decentration of a pair of spherical lenses, Decentration of a planocylinder, Prismocylinders, Decentration sph. Cyl. & teric, Effect on the eyes of lens decentration.

9. Bifocal Lenses — 2

Introduction, size & shapes of near portion, Requirements of bifocal lenses, Type of bifocal lenses, Multifocal lenses.

10. Photometry — 5

Photometry, Intensity of illumination of a surface, illuminating power of a source of light, candle power, luxmetre candle, luminous flux, inverse square law, verification of inverse square law, principal of photometry, Bunsen’s photometer, Rumford’s photometer.

11. Nature of Light — 2

Dual nature of light, Historical development, Wave motion, Simple Harmonic Motion (elementary idea), wave fronts, the electromagnetic theory, stimulated emission & optical pumping.

12. Dispersion & Colour — 5

Dispersion & Production of, pure spectrum, Spectrometer, Spectra & types of spectra (elementary concepts), Dispersive power, Achromatic lenses, Ultra-violet, Biological effects & Application of V.v., the infrared Biological effect, application of I.R.

PRACTICAL

Time: 3 Hours ***Marks: 70***

1.	Introduction to glass, material for grinding and machinery.	**5**
2.	Spherical grinding, low medium and high medium.	**5**
3.	Spherical grinding, low medium & high plus.	**5**
4.	Cylindrical & Sphere-cylindrical, grinding.	**5**
5.	Bifocal grinding.	**10**
6.	Prism with prescription.	**5**
7.	Verification of fabricated lens surfaces & power.	**5**
8.	Lens orientation, marking and cutting.	**5**
9.	Lens' edging and fitting.	**5**
10.	Verification of prescription and adjustment.	**10**
11.	Fitting of glasses on face and post fitting possible adjustments.	**10**

CLASS–XI
OPTIONAL
BIOLOGY OPHTHALMIC (657)
THEORY

Time: 2 Hours ***Marks: 30***

1. Anatomy and Physiology of Animals — 15

Introduction

Elucidation of life processes common to both plants and animals. Microscopic structure of tissues and organs of a mammal. Tissues, connective and epithelial tissues (all types), bone blood and lymph. A brief mention of haemobolesis, muscular tissue and nervous tissue, Organs, Stomach, small intestine, liver, pancreas, lung, spleen, kidney, skin, testis and ovary.

Fundamental anatomy and physiology of the Digestive system, (with reference to immunity), Excretory system, Nervous system with special reference to transmission of the nerve impulse, endocrine glands with a brief reference to the physiology of reproduction and fertility control.

2. Anatomy and Physiology of Plants (Only at Elementary Level) — 15

Meristems, Xylem and phylum, their cell elements and functions, Transport and storage of organic substances, transport of water and minerals. Internal structures of root, stem and leaves, secondary growth in dicot root and stem.

Photosynthesis, mechanism and important fators affecting the process, stomatal mechanism, Importance of macro and micro nutrients. Transpiration, Respiration, plant growth and development, Internal and External regulation of growth and development of plants, Tropic and turger movements.

PRACTICAL

Time: 3 Hours ***Marks: 70***

1. Preparation of temporary stained mounts of cheek squamous, epithelial cells of man, skin, squamous epithemlial cells of frog to study simple animal cells. **5**
2. Preparation of slides of frog buccal epithelium/gut ciliates of frog to study ciliary movement. **5**
3. Observation and making of labelled diagrams of microscopic structures of the following mammalian tissues, certilage bone, muscle (Unstriated, stiated and cardial) spinal card. 5
4. Dissection of rat and study of the general viscera and digestive systems. **5**
5. Study of human skeletal system. **5**
6. (a) Preparation of stained temporary slides of free and transverse section of root and stem and monocots and dicots, Observation and sketching. **5**

   (b) Study of monocot and dicot leaves from permanent slides.
7. Preparation of temporary stained slides for the study of secondary growth in dicot stem. **5**
8. Staining and observing microscopically the cell wall, components, Cellulose and lignum. **5**
9. To show ascent of sap through xylem tissues in plants. **5**
10. (a) Study of the stomata through temporary slide preparation and effect of light and darkness, and dehydration of the opening and closing of stomata. **5**
11. Study of the effect of carbon dioxide concentration on the rate of photosynthesis using an aquatic plant. **5**
12. (a) Study of rate of aerobic respiration in flower buds/leaf tissue/germinating seeds. **5**

    (b) Study of the anaerobic respiration of yeast and testing of the product (Alcohol and CO_2).
13. Identification (upto class) of amoeba, paramecium, hydra liver fluke, bug, shark or scoliodon, anaba, frog or toad calotes or house gecko, house sparrow, pigeon, guinea pig, or rabbit. **5**
14. Collection of Plants and Animal. **5**

CLASS–XII
ELECTIVE
OPTICS (658)

THEORY

Time: 2 Hours ***Marks: 30***

1. Selected-Ray optical imagery in mirrors. **1**
2. Selected-Ray optical imagery in lenses. **1**
3. Cardinal points and planes, thick lenses, and single refracting surfaces. **1**
4. Magnification, magnifying power and optical system. **1**
5. Power of lens. **1**
6. Transposition of spectabcle lenses, shapes and sizes. **1**
7. Grinding machincs. **1**
8. Grinding materials. **1**

9.	Tool and gauge and their testing.	**1**
10.	Spherical lenses.	**1**
11.	Cylindrical lenses.	**1**
12.	Bifocals and Multifocals.	**1**
13.	Ophthalmic prisms.	**1**
14.	Prisms effects.	**1**
15.	Obliques cylinders.	**1**
16.	Protective lenses.	**1**
17.	A spherical lenses.	**1**
18.	Special lenses-miscellaneous lenses and appliances.	**1**
19.	Nomenclature of prism and their uses.	**1**
20.	Opthalmic glass and physically form of lenses and ophthalmic lenses.	**1**
21.	Transmission density and opacity of a refracting glass and glass coatings.	**1**
22.	Cylinderical lenses, strum's coniod.	**1**
23.	Lens combinations.	**1**
24.	Aberration of lenses.	**1**
25.	Principle of fabricating various types of spectable lenses.	**1**
26.	Ophthalmic plastic lenses.	**1**
27.	Refractive media of eye and principle of visual imagery and corneal system and reticular system.	**1**
28.	Reduced eye and images formation including Guass Theorem.	**1.5**
29.	Aberration of eye.	**1.5**

PRACTICAL

Time: 3 Hours ***Marks: 70***

1.	Making of low minus sphere.	–3	**14**
2.	Making of low plus sphere.	+3	**14**
3.	Making of spheric cylindrical.	4	**14**
4.	Making of high minus spherical.	–2	**14**
5.	Making of plus spherocylinder +7 to +14 spheres + 1 to +6 cylinders.		**14**

CLASS–XII
ELECTIVE
OPHTHALMIC TECHNIQUES (659)
THEORY

Time: 2 Hours ***Marks: 30***

1.	**Errors of Refraction**	**1**
2.	**Subjective Examination**	**1**
3.	**Hypermetropin**	**2**
	(i) Aetiology.	

(ii) Optical condition.

(iii) Normal age variation.

(iv) Clinical pathology.

(v) Clinical symptoms.

(vi) Treatment.

4. Myporia **2**

(i) Aetiology.

(ii) Optical condition.

(iii) Clinical pathology.

(iv) Clinical symptoms.

(v) Prognosis.

(vi) Prophylaxis.

(vii) Treatment.

5. Astigmatism **2**

(i) Aetiology.

(ii) Optical condition.

(iii) Types of astigmatism.

(iv) Regular and irregular astigmatism.

6. Theoretical Basis of Optical Correction **1**

7. Anisometropia and Aniseikonia **2**

Anisometropia

(i) Vision .

(ii) Treatment.

Aniseikonia

(i) Aetiology.

(ii) Types.

(iii) Symptoms.

(iv) Investigation.

(v) Treatment.

8. Spectacle Lenses and Binocular Vision **1**

9. Aphakia **1**

(i) Diagnosis.

(ii) Optical condition.

(iii) Treatment.

10. Accommodation **1**

(i) The nature and mechanism of accommodation.

(ii) Physical and Physiological accommodation.

(iii) The range, amplitude and availability of accommodation.

(iv) Associated phenomenon.

(v) Fatigue of accommodation.

11. Convergence **1**

(i) Volumtary and reflex convergence.

(ii) Measurment of convergence.

(iii) Relation with accommodation.

(iv) Binocular accommodation.

(v) Fatigue of convergence.

12. Anomalies of Accommodation and Convergence **1**

Presbyopia

(i) Ill sustained accommodation.

(ii) Spasm insufficiency.

(iii) Ill sustained accommodation.

(iv) Inertia and paralysis.

(v) Cycloplegia.

13. (a) Anomalies of Convergence **1**

(i) Convergence insufficiency.

(ii) Errors of Refraction: Anomalies of Refraction.

14. Frames **1**

(a) Introduction.

(b) Metals.

(c) Tortoise shell.

(d) Plastic and synthetic materials.

(e) Types of spectacles.

(f) System of measurement and frame measurements.

(g) Lectures on combination of lenses.

– Principal of Ophthalmoscope.

– Retinoscopes and other ophthalmic equipment, microscopy, telescopes etc. For which the lense manufacture is required.

15. System of Measurement of Frame Measures **1**

(a) Datum system.

(b) Boxing system.

(c) Gomac system.

(d) Frame measurement.

16. Frame Measurement **1**

17. Lens Shape **1**

Definition of lens shapes.

(i) Standardization of lens size measurement.

(ii) Major minor relationship.

(iii) Measurement of angles.

18. Joints **1**

(i) Position of joints, angles of joints.

(ii) Frontal width and tempal width.

19. Contact Lens **1**

20. Causes of Visual Impairment and Blindness **1**

21. Classification of Low Vision Aids and Special Features of Groups and their Mode of Motion **1**

22. Visual Requirement in Industries **1**

Ophthalmic lens

(a) Optical machineries.

(i) Grinding machinery.

(ii) Edging and fitting machinery.

(b) Grinding material.

(c) Tools and gauges and their testing.

(d) Fusing of bifocal lenses.

(e) Coating of Ophthalmic lenses.

(f) Making of different types of lenses.

(g) Plastics lenses.

23. Prevention of Industrial Injury and Special Service to Aid this **1**

24. Protective Lenses **1**

Radiant energy: Effects of radiations on eyes, Absorption of radiations by glasses, Some protective glasses available, Further effects of tinted- glasses, metalic eye protectors, protection against mechanical injury, globular lenses, reinforced (safety) glasses.

25. Thick Lenses **1**

26. Lens Form and Thickness, Effective, Equivalent and Vertex Power **1**

PRACTICAL

Time: 3 Hours ***Marks: 70***

1. Fitting round in Metal Frame. **5**
2. Fitting round in Plastic Frame. **5**
3. Fitting shaped in Metal Frame. **5**
4. Fitting shaped in Plastic Frame. **5**
5. Heating of frames for fitting. **5**
6. Making of one piece bifocal. **5**
7. Fitting for biofocal. **10**
   (a) Kryotoic.
   (b) Executive.
   (c) One piece bifocal.
   (d) D-shaped bifocal.
8. Making of kryptoic bifocal. **5**
9. Making of plane prisms. **5**
10. Making of prism with cylindrical lens. **5**
11. Making of prisms with spherical lens. **5**

12. Fitting with decentration. **5**

13. Making of bifocal with prism. **5**

CLASS–XII
OPTIONAL
BIOLOGY OPHTHALMIC (657)
THEORY

Time: 2 Hours ***Marks: 30***

1. Cell Biology **5**

Introduction: Cell theory, Cell as a unit of life, Tools and techniques of cell studies, Microscopy (use of microscope and calibration), Elements of microscopes, Electron Microscopy elementary knowledge of principles. Biomembranes – Transport mechanism, cellular respiration, Cell organelles structure and their functions enzymes, and hormones-their chemical and physical structure, mode of action, Role of regulation of cellular activities, Nucleus chromosomes, DNA structure including events in replication and transcription, Genetic code, protein synthesis.

2. Genetics **5**

Mitosis, and details of meiosis, and meiosis compared and constrasted, significance of meiosis, Monohybrid and bi-hybri crosses, Mendel's laws of inheritance, Linkage and Crossing over, discovery of linkage, stage at which crossing over occurs, Non-mendelian Inheritance, Reasons for the success of Mendal in his experiments, Sex-linked inheritance, Neurospora genetics, Gene interaction and expression.

Mutations

Discovery, types of mutation, mutations in, diploids and haploids, physical and chemical mutagens, Continuous and discontinuous variation, Role of mutations in evolution, Role in Agriculture and Animal husbandry.

Mendelism as the basis of genetics, Factor from gene to cistron, One Gene, One enzyme and the cistron-one poly peptide chain.

Quantitative inheritance, example of quantitive inheritance. e.g. colour of wheat kernel, colour of skin in man etc. Monogenic vs. Polygenic inheritance.

Human genetics, Human chromosomes, Numerical changes, Polygenic inheritance, Blood grinning Isomatic cell genetics, Protoplast fusion, Manmads hybrids, sex-linked characters, Genetic disorders-Genetics and society, Improvement of Plants and animals, conservation of gene pool, Genetic counselling, Genetic engineering.

3. Basic Features of Development in Animals **5**

Formation of genes, Structure of ovum, types of eggs, example of insect, frog chick and mammalian eggs, structure of sperm motility and number of sperms.

Fertilization - Aspect, sites and types, cleavage, significance, types, difference from ordinary mitosis, Gastrulation - Process and results.

4. Significance of Life Cycles with Special Reference **5**

To alternation of generation as exemplified in spirogyra: Funaria, Dryopteris, Pinus and angiosperms (No structural details), Elements of tissue and Organ culture, Differentiation, concept of cellular totipostency, normal growth in plants.

5. Human Diseases **4**

Definition of diseases, classification, general account of causes and control, immunity and chemotherapy, Diseases of Man: Typhoid, Tuberclulosis, Plague, Cholera, Polio, Rabies, measles, Ring worm, dandruff worms and dysentery.

(Different types of pathogens such as bacteria, viruses and virus like organisms, fungi, helminthes, protozoa.)

Sources of infections, infection and contagion, economic importance of diseases, methods of prevention and biological control).

6. Forestry **3**

Elementary idea of forest wealth and conservation.

7. Industrial use of Microorganisms

Fermentation, Alcohol and Antibiotics. **3**

PRACTICAL

Time: 3 Hours ***Marks: 70***

1. To show cytoplasmic streaming movement in Plant Cell (Hydrilla) villisnerial (Rhoco) and factors affecting the same Temperature (hot and cold). **4**
2. To study the function of plasma membrane: Hasmolysis and plosmolysis. **4**
3. Demonstration of the factors affecting the selective permeability of the cell membrane. **6**
   (a) Effect of temperature.
   (b) Effect of chemicals, benzene, formalin.
   (c) Effect of concentration of solute.
4. (a) Enzymatic hydrolysis of protein and starch. **4**
   (b) Factors affecting enzymatic activity, Temperature, Chemicals, Formaline, Benzene, Chloroform.
5. Demonstration of dehydrogenises using methyline blue as electron acceptor. **4**
   (a) Study of various stages of mitosis from permanent slides.
   (b) To study the various stages of mitosis from squack preparation of onion/ Garlic root tips.
6. Study of various stages of meiosis from permanent slides. **4**
7. To study the above from squack preparation of flower buds of grass hopper's testis. **2**
8. Preparation of model of DNA molecule to show double helical organization. **5**
9. To demonstrate sex-chromation from buccal smear. **2**
10. Practical exercise on data supplied to show dihybrid ration. **4**
11. Practical survey of human genetic factors-such as rolling of tongue: tasters and non-tasters, colour blindness, attached earlobes, texture of hair, close data to be pooled and interpreted on the basis of statistics. **3**
12. Study and sketch the development of angiosperms from permanent slies. **5**
13. Dissection and display of the following systems in Rat: **5**
    (a) Digestive system.
    (b) Arterial system.
    (c) Venous system.
    (d) Reproductive system (male/female).
    (e) Urinary system (male/female).
14. Preparation of Seman slides from male rat's testis to show the motility of sperms. **3**
15. Study and sketch the development of Mammals from permanent slides at least. **4**
16. Study and sketch of ecto and endo parasites e.g. Entemoeba, Liver fluke, Tapeworm, Ascaris, Bed bug, and louse. **2**

17. Separation of the chlorophyll pigments by simple paper chromatography. **4**

18. Projects/investigatory experiments. **5**

LIST OF RECOMMENDED BOOKS

1. **Optics and Refraction** by Prof. L.P. Aggarwal.
2. **Optics** by Finchis.
3. **Emsley's and Swaine's Opthaimic Lenses** by AG. Bannet. Vol. I & II London (The Hallon Press Ltd. Columbia House, 69, Aldwyeb, W.C. 2, 1968).
4. **Practice of Refraction** by Dubsley.
5. **Anatomy of Eye** by Wolf.

SUGGESTED LIST OF EQUIPMENT

(for a batch of 16 students)

1. **NWI-51**

   One set of 2 Nose Hand Edging Machine 12th size fitted with 12th dia. India stone of fine grains with steel table with elect, motor of ½ H.P. Single phase (Crompton) and switch (Stone is Grindwel Norton Ltd.).

   DATA **Table Size 42" 24" 30"**

   Top plywood and covered with G.I. Sheet. Heavy duty steel angle iron frame. Approx. Weight 60 kgs.

   POWER **½ H.P. Elect. Motor of Single phase AC. Voltage (Crompton) used in each set**.

2. **NWI-52**

   2 Sets of 4 singles Sph. Machine each with elect, motor of 10 HP. (Crompton) single phase AC. And switch with gun metal bushes and aluminium tubs.

   DATA **Table size 90" 33" 33"**

   POWER **1 H.P.Elect Motor of single phase AC. Voltage (Crompton) used in one set.**

3. **NWI-53**

   2 Sets of 4 singles Cyl. Machine each with Elect. Motor of 1 H.P. (Crompton) single phase AC. And switch with gun metal bushes and aluminium tubes."

   DATA **Table size 78" 33" 30"**

   Heavy duty steel angle iron frame. Top plywood and covered with G.I. sheet (approx. Wt. 4½ quintal each set.

   POWER **1 H.P. Elect, motor of single phase AC. Voltage, (Crompton) use in one set.**

4. Spherical Tools (plus and Minus).

   One set of 81 pairs Sph. Tools from 0.00 to 20.00.

5. Cylindrical tools (plus and Minus).

   (i) One set of 24 pairs Cyl. Tools Tone base (6.00) from 0.25 to 6.00 Cyl.

   (ii) One set of 24 pairs Cyl. Tools Flat base (6.00) from 0.25 to 6.00 Cyl.

6. Set of Gauge (Brass).
7. One set of Tools (Bifocal).
8. One Focimeter.
9. 12 Doz. Buttons sph.
10. 12 Doz Buttons cyl.

11. Misc. consumable articles.
12. Geneva lens Measure.
13 Ophtalmoscope and Retinoscope.
14. Fissing Oven.
15. Low vision aids, hand stand magnifier.
16. Loupes.
17. Edging Machine Diamond.
18. Trial Box.

MEDICAL LABORATORY TECHNOLOGY

CLASS–XI
ELECTIVE
LABORATORY MEDICINE (660)
(CLINICAL PATHOLOGY, HEMATOLOGY & HISTOPATHOLOGY) (MLT)
THEORY

Time: 2.5 Hours ***Marks: 50***

1. Clinical Pathology **12**

- General Principles of Laboratory Organisation.
- Components and function of Laboratory.
- Staffing of Laboratory, job description.
- Specimen handling, transport, preservation and disposal.
- Laboratory Safety and Laboratory hazard.
- Care of instruments, equipment maintenance.
- Basic principles of quality control.
- Ethics, Code of conduct and interrelationship.

2. Haematology 13

- Introduction to Haematology, Significance and composition of blood.
- Collection of blood samples.
- Haemopoises.
- Red blood cells (RBC)

  Functions, normal values RBC counting, interpretation, significance in health and diseases.
- White blood cells (WBC)

  Leucocyte normal values, WBC total count, different count, Romanowsky stains, staining procedures, normal values interpretation in health and diseases.
- Haemoglobin (Hb)

  Normal and abnormal haemoglobin, various methods of estimation, including automation procedures, clinical importance.
- Packed Cell Volume (PCW)

  Hematocrit, Micro and Macro methods, clinical importance.
- Absolute Values

  MCV, MCH, NCHC, definition, calculations, clinical importance.
- Anemias

  Morphologic anemias.

  Iron deficiency anemia.

  Clinical significance.

  Erythrocyte sedimentation rate (ESR)

  Westergren's method, Wintrobe's method, Factors affecting ESR, Corrected ESR. Clinical importances.

3. Urine Fluids and Stool 12

- Urine Analysis: Formation of urine, composition of urine, normal and pathological constituents.
- Sputum: Collection methods, AFB stains.
- Peritoneal and Pleural fluids: Physical and microscopic examination, Clinical importances.
- Semen: Methods of collection, Physical, chemical and microscopic examination, Sperm count and clinical importance.
- Gastric Analysis: Composition of Gastric juice, Methods of collection, Gastric analysis, Tubeless gastric analysis, Clinical significance.
- Stool: Methods of collection, Concentration, Preparation methods, Physical, chemical, and mircroscopic examination, Morphology of various and cyst in stool.
- Histopathology and Cytology

4. Histotechnology (Elementary) 13

- Introduction of subject, Cell, tissue and their function.
- Methods of examination of tissues and cells.
- Fixation of Tissues: Classification of fixatives, simple fixatives and their properties, cytological fixatives, Histochemical fixatives.
- Tissue Processing: Collection of specimen, Labelling and processing, Dehydration, Impregnation, Embedding.
- Quality control and automation in Histotechnology.

- Section Cutting: Microtomes and microtome knives, techniques of section cutting.
- Staining: Use of various routine stains in histotechnology, staining technique of haematoxylin and eosin, mounting of section.
- Cytology: Cytotechniques, elementary knowledge, preparation of cytology slides, FNZC (Fine Needle Aspiration Cytology), Papanicolaou staining. Giemsa staining, Sex chromatin staining.

PRACTICAL

Time: 2.5 Hours ***Marks: 50***

1. Clinical Pathology 25

(a) Practice of drawing of blood from finger and from vein under expert guidance. **5**

(b) Demonstration of prepration of anticoagulants, RBC fluid, WBC fluid, fluid for eosinophil count and platelet counts. **5**

(c) Demonstration of PCV and ESR measurement by wintrobe and westergrene methods. **5**

(d) Practicals-RBC Count. Total WBC Count Hb-Estimation, Different Count. **5**

(e) Urine Examination: Routine examination, Physical, Chemical, Microscopic examination. **2.5**

(f) Stool Examination: Demonstration of ova and cyst of nematodes and cystodes. **2.5**

2. Histopathology and Cytology 25

(a) Demonstration of use of various microtomes. **5**

(b) Demonstration of section cutting and preparation of slides, demonstration of use of automatic tissue, changer, tissue processing procedures. **5**

(c) Demonstration of or preparation of formal saline and various fixatives of common use and decalcifying fluids. **5**

(d) Demonstration for sharpening of knives. **5**

(e) Practical: Staining of slides, using. **5**

(i) Haematoxylin and eosin stains and examination under microscope.

(ii) Preparation and fixation of cytology smears, staining, smears by Papanicolaou's/ Giemsa technique.

CLASS–XI
ELECTIVE
CLINICAL BIOCHEMISTRY, MICROBIOLOGY (MLT) (661)
THEORY

Time: 2.5 Hours ***Marks: 50***

Biochemistry 25

1. **Introduction to Biochemistry:** Definition, aim and scope of biochemistry.
2. **Fundamentals of Organic Chemistry, Organic Compound Definition.**
   - Amines, Aldehydes, Acids, Phenols, Esters, Ketones, Colloids.
3. **Elementary Knowledge of Analytical Biochemistry.**

   Definition, principles, functions and uses of instruments & elementary colorimetry, balance centrifuge: colorimeter photoelectric colorimeter; Visual colorimeter, flame photometry, spectrophotometer,

Electrophoresis, Standard Calibration Curve, Lambert Beer's Law, Principles of Chromatography, Thin Layer Chromatography.

Definition of solution, Normal Standard solution, Buffer solution, Molar solution.

Methods of expressing concentration (percent, molar, normal).

4. **Elementary Knowledge of Inorganic Biochemistry.**
   - õ Structure of atom, atomic weight, molecular weight, gram molecular weight: equivalent weight, gram equivalent, acids, bases and salts.
   - õ Hydrogen ion concentration and measurement, indicators and buffer preparation.
5. **Elementary Knowledge of Enzymes and Coenzymes.**
   - õ Vitamin and Vitamin deficiency diseases.
6. **Non Protein Nitrogenous Compounds.**
   - õ Definition, Elementary knowledge of formation and functions; Estimation of urea, creatinine and uric acid.
7. **Serum Electrolytes and Ions.**
   - õ Determination of Sodium & Potassium Chloride, Serum Calcium, Phosphorus, Clinical importance, (Interpretation).

Microbiology **25**

1. Introduction to Microbiology: Historical aspects, relationship of microorganism to man, Microorganism in diseases and health.
2. Sterilisation and Disinfection, Physical, chemical and mechanical methods.
3. Disposal contaminated media, Sterilisation of media, syringes, glass wares apparatus.
4. Classifiaction and morphology of bacteria, Structure of a cell, capsule, flagella, spore, Bacterial pathogenesity.
5. Staining of bacteria: Gram, Zeihl-Neelson, Albert Stain, Spore Stains.
6. Bacterial metabolism, growth requirement of bacterial, cultivation of microorganism.
7. Identification of bacteria and preparation of culture media, General types of media: common use in laboratories, methods of making film/smears preparation.
8. Stains: Simple Stains, Grain's Staining method, Ziehl-Neelson method, modification of Ziehl-Neelson method, Albert stain, wet film-India ink, Stains spore, Stains capsule, Demonstration of flagella by modified Leif Son's method, Romanowsky Stains (Leishman's Stain, Giemsa stain) tests and reactions.
9. Cultural characteristics and Biochemical of common gram positive and Gram negative micrograms.
10. Principles of microbiological diagnosis: Diagnosis of diseases, direct indirect evidence, Morphological classification of Bacteria, Identification of Bacteria (Gram positive Coeeicolonies in blood agar, Gram negative Cocci Oxidase positive colonies on Bloodagar/Chocleteagar; identification of Gram negative Bacilli-growth in Mac Conkeys agar/DCA.
11. Anaerobic culture - general principles.
12. Classification and general properties of pathogenic fungi.
13. Immunology: Immunoelectrophoresis apparatus, Immunoglobins, immunologic Laboratory tests, Immunodiffusion, Immunoelectrophoresis, CIEP (Counter Immuno electro Osmophoresis, Precipitation, agglutination).

PRACTICAL

Time: 2.5 Hours ***Marks: 50***

Biochemistry **25**

Demonstration

1. Cleaning of glass ware.
2. Preparation of various solutions, Chromic acid was solution, Saturated solutions, various molar solutions, Buffer solutions.
3. Single pan balance, operation and maintenance.
4. pH-meter; components, maintenance.
5. Titration– Acid and Normal solution.
6. Use and Practice of various types of colorimeters and their maintenance.
7. Distillation of water, single distillation, double and triple distillation: all glass distillation.
8. Serum electrolytes Na^+, K^+ and CI', Ca^+, PO^+_4

Practical

1. Estimation of Blood Urea. **8**
2. Estimation of Serum Creatinine. **8**
3. Estimation of Serum Uric Acid. **9**

Microbiology **25**

Only one exercise to be given.

Demonstration

1. Care and Cleaning of glass wares, Syringes, and preparation of Pasteur pipette.
2. Operation and Maintenance of autoclave incubator, water bath, pH meter, vacuum pump.
3. Collection of clinical meterials - blood, urine, stool, swab etc. for bacterial examination.

Practical

(i) Hanging drop preparation. **8**

(ii) Gram's Stain. **8**

(iii) Giemsa's Stain/Leishman. **9**

CLASS–XI
OPTIONAL
ANATOMY AND PHYSIOLOGY (MLT) (662)
THEORY

Time: 2.5 Hours ***Marks: 50***

Human Anatomy

Elements of Anatomy can be dealt with as following.

The Human Body **1**

Its different parts, Common anatomical terms, Anatomical positions and important planes.

The Cell **2**

Structure, organelles and their functions.

Primary Tissues **2**

Primary tissues of human body, their classification, structure and functions.

Skeletal System 2

Its joints and movements.

Mouth and Pharynx 2

With special reference to Salivary glands and tonsils.

Thoracic Cavity 2

The Respiratory system: Pleura and the organs in site, Gross structure of the organs of respiration.

Heart and Pericardium 2

Gross structure of the heart and the pericardium, the artereal venous and the Lymphatic Systems.

Abdomen 1

Structure of Alimentary Canal, Oesophagus and Stomach, Planes and Regions of the Abdomen Abdominal Cavity and Peritoneum, Locations of Different organs in the Abdomen of site.

Gross structure of Stomach, Intestine, Mesentery Spleen, Liver, Gall Bladdar and Pancreas.

Urinary Tract 1

The Urinary tract, Gross Structure of Kidney, Ureter Bladder and urethra.

Genital Tract 1

The genital system, structure and functions of male and female genital organs.

Brain 5

Gross structure of brain, spinal cord and nerves, meanings and cerebrospinal fluid.

Surface Marking of Important Organs 4

Heart and Lungs.

Stomach, Liver, Kidney, Urinary Bladder and Vertebrae.

Parts of Upper Limb, Bones, Bony Landmarks and Important Vessels like Median Cubital Vein, Radial and Bronchial Artery, Parts of the Lower Limb, Bones, Bony Landmarks and Important Blood Vessels and Muscles for Injections Site.

Note: The lectures given should be aided with charts, models and by drawing diagrams emphasising on the site, size functions and relationships of the neighbouring internal organs.

Physiology

Blood 5

- Composition, classification and function.
- Description of blood cells, normal counts and functions.
- Normal value of specific gravity, viscosity etc.
- Cerebrospinal Fluid: Formation, composition and function.
- Composition and functions of lymph.
- Haemopoiesis, Haemopoietic tissues.

Clinical Aspects 2

- Blood group, ABO and RH Basis for classification determination.
- Importance of Blood Group, Anemia.

Cardio Vascular System 4

- Functions of Heart and Blood Vessels.
- Circulation: Systemic circulation, Pulmonary circulation.
- Cardiac Cycle: A brief knowledge of events.
- Nerve supply to heart and blood vessels.
- Definitions like: Cardiac output, pulse, blood pressure, electrocardiogram.

Respiratory System 3

- Naming the structures involved in respiration and their functions.
- External and internal respiration, mechanism of respiration.
- Respiratory centres to be mentioned.
- Transport of O_2 and CO_2 in Blood.
- Definition of respiratory rate, tidal volume, vital capacity, cyanosis.
- Artificial respiration, Hypoxia.

Excretory System 2

- Functions of Glomerulus and tubules, Composition of urine-normal and abnormal.
- Skin, Functions of skin.

Digestive System 3

- Composition and functions of saliva mastication and deglutition.
- Functions of stomach, composition of gastric juice, bilc, panereatic juice and succus entericus.
- Digestion of food by different enzymes, absorption and defecation.
- Nutrition, constituents of food.

Endocrine Glands 2

- Definition of endocrine glands, Naming the endocrine glands and the hormones secreted by them and briefly their functions.

Reproductive System 4

- Naming the primary and accessory sex organs in male and female.
- Naming the secondary sexual characters in male and female.
- Functions of ovary, formation of ova, actions of testosterons.
- Clinical Aspects: Vasectomy and Tubectomy, IUCD, Contraceptives.

PRACTICAL

Time: 2.5 Hours ***Marks: 50***

Anatomy 5

- Demonstration of parts of body and (body) Landmarks on the surface.
- Identification of Cells and Basic Tissues.
- The Skeletal system.
- Head and Neck.

- Identification of Important Organs and Muscles within Head and Neck.

Thorax 5

- Demonstration of Interior of Throax with Organs in site.
- Respiratory System and Picurace.
- Heart and Great Vessels.

Abdomen 5

- Identification and Demonstration of various organs within Abdomen.
- Liver and Gall Bladder.
- Peritoneum, Stomach and Intestines.
- Spleen, Pancreas and parts of Urinary System.

Central Nervous System 5

- Spinal Level and Site of Lumber Puncture.
- Surface Anatomy of important organs and Blood Vessels.
- Demonstration of Limbs with special reference to important Vessels and Muscles.
- Identification of certain models like those of: Brain, Heart, Embryology, Kindney.
- Guidance and demonstration of Museum Techniques.
- Fixing, Labeling and Storage of Specimens, Mounting, Labeling of Specimens.
- Arrangement of specimen systematically.

Note: Demonstration of Practical by

- Drawing Diagrams and Labelling. **1**
- Demonstration of Specimens. **1**
- Demonstration of models and skeleton. **1**
- The Microscope: Its usage, clearing, maintenance. **1**
- Identification of Blood Cells under the microscope, RBC, various types of WBC Platelets, Reticulocytes. **1**
- RBC behaviour in Isotonic, hypertonic and hypertonic, Sodium chloride solution. **1**
- Preparation of anticoagulants, double oxalate and sodium citrate. **2**
- Collection of Blood to obtain plasma and serum samples. **2**
- Haematocrit Estimation of various haematological parameters. **2**
- Identification of ruling area in Neubaures chamber. **2**
- Demonstration of usage of RBC and WBC pipette and westergrens pipette, Wintrobe tube. **2**
- Hemoglobin estimation. **2**
- Preparation of blood smears, Staining by Giemsa/leishman. **2**
- Demonstration of blood pressure recording and pulse. **2**
- Demonstration of normal and abnormal constituents of urine (e.g. glucose, protein, ketone bodies, bilesalts, bile pigments and blood). **2**
- Preparation of various stains. **2**
- Estimation of coagulation parameters like Bleeding time, clotting and prothrombin time. **2**

- Demonstration Practicals-Use and Practice of Haematological Parameters on Semi automated/and Fully automated haematological analyser to be shown. **2**

CLASS–XII
ELECTIVE
LABORATORY MEDICINE (660)
(CLINICAL PATHOLOGY, HEMATOLOGY AND HISTOPATHOLOGY) (MLT)
THEORY

Time: 2.5 Hours ***Marks: 50***

Immuno Haematology and Blood Banking **14**

Basic Principles of Blood Banking. Immuno haematology and Transfusion Medicine. Human Blood Group system-ABO Rh and other blood groups.

ABO Blood group system-Genetics and Biochemistry, Clinical significance of ABO system. Principles of ABO group determination. Bombay group, Blood group and disease.

Rhesus Blood group system-Genetics, Rh D positive and Rh D negative groups, D variagnt, clinical significance of Rh blood group system.

Other blood systems and their clinical significance. Blood group serology-Principle of Techniques. Antiglobulin (Coombs) test-Principles. Reagent, Utility of Direct and Indirect Coombs' test. Specificity, Sources of Blood for Transfusion-Voluntary, Replacement and Professional Blood Donors, Donor Panel and its utilisation.

Guidelines for Transfusion Practice: Selection of Blood and its components, Compatibility testing-Rationale, Major and Minor cross-matching, Design of the compability.

Haemaphoresis (Apharesis).

Blood Transfusion-Whole Blood Indication, Selection of Different Components for their uses.

Complications of Blood Transfusion and their prevention.

Investigation of Transfusion reaction.

Alternatives to Homologous Blood Transfusion and concept of Autologous Blood Transfusion.

Haemolytic diseases of Newborns.

Blood Banks and transfusion services – Standards, Organization and Planning.

Clinical Pathology **14**

Cerebral Spinal Fluid (CSF)- Composition, collection of the fluids physical, chemical, bectological & cell count, clinical significance.

Pericardial, Pleural, Peritoneal, Amniotic and Synovial fluids-Physical, chemical, cytological, bectological examination.

Exfoliative Cytology on sputum.

Quantitative Cytology on sputum.

Quantitative urine test for proteins, Bence Jones protein, Acetone body, urebilinogen Bilepigment & Porphobilinogen, Porphyrins & Porphyuria.

Evaluation of renal functions.

Normal and abnormal Haemopoiesis.

Anemia – Mechanism of production, Megaloblastic and Haemolytic anemias. Osmotic fragility, screening tests, clinical significance, Haemoglobinopathies normal and abnormal Hibsickle cell anemia-thalassemia, Bone Marrow smear-indications and significance, Leukemias acute and chronic leukemia, Aleukemic Leukemia and Leukemoid reaction.

Diagnostic significance of peripheral smears.

G6PD tests – Qualitative, clinical significance of G6PD – deficiericy.

LE – Cell phenomenon.

Platelets1- morphology, platelet count platelet deficiencies.

Coagulation: Factors of coagulation, mechanism, Preanrembin time, Bleeding time, Coagulation time.

Histopathology **12**

Frozen Section - use of crystal/freezing microtone, indications, uses, Staining procedures frozen sections, Decalcification - section of tissue techniques, assessment chelating agents, decalcifying solution, surface decalcification.

Specialised Techniques and Procedure of tissue processing, Plastic embedded sections and electron microscopy, Elementary knowledge Morphometry.

Special stains – Reticular stain, Anyloid, PAS, Pigments, Stains for connective tissues, cytoplasmic granules, nerve cells and nerve fibre.

Museum techniques – Preparation of specimen, fixation, restoration, colour preservation and presentation.

Cytology **10**

Vaginal smears: Hormone effects, changes, cervical smear inflammatory and neoplastic.

Sex chromtin buccal smear FNAC (fine needle aspiration cytology).

PRACTICAL

Time: 2.5 Hours ***Marks: 50***

(2 sessions of 1½ hr. each)

Laboratory Medicine **30**

õ	Immuno haematology and Blood Banking.	**10**
õ	Viva and record.	**5**
õ	Clinical Pathology.	**10**
õ	Viva and record.	**5**

Determination of blood group (ABO) Slide and tube techniques.

Cross matching–Methods of major and minor matching (Demonstration).

Rh–typing Slide technique, Demonstration of tube technique, Rapid tube test.

Saline and D. one stage Albumin technique, two stage albumin technique.

Coomb's antihuman globulin technique.

Coomb's test–Direct. Indirect test.

Donor Screening and selections (Observations).

Blood storage and maintenance (Demonstration's).

Demonstrations: Platelet count, Reticulocyte count, Absolute eosinophil count.

Clotting and Bleeding time.

Histotechnology and Cytology **(10+10)**

õ	Histotechnology.	**10**
õ	Cytology.	**5**

- Viva & Records. **5**

Histotechnology **10**

- Demonstration (i) Section cutting.
  (ii) PAS stain, Reticulin stain, Mucin stain.
  (iii) Museum technique.
- H & E Stain and Reporting under microscope for staining characterisation.
- Sex Chromatins stains.

Cytology **10**

- Demonstration (i) FNAC.
  (ii) Collection of cervical and vaginal smear.
- Staining smears Giemsas, papanicolau.

Note: Certification of class record and maintenance of each practical record to be submitted to external examiners.

CLASS–XII
ELECTIVE
CLINICAL BIOCHEMISTRY (MLT) (661)
THEORY

Time: 2.5 Hours ***Marks: 50***

1. Metabolism **18**

Carbohydrates: Definition, functions, classification, Metabolism of carbohydrates, Digestion and absorption of carbohydrates, Citric acid cycle, Hexose Monophosphate shunt, Glycogenolysis, Glycogenesis, Gluconeogenesis, Regulation of Blood Sugar, Diabetes Mellitus, Glycosylated Haemoglobin.

Lipids: Definition, Classification, Importance, General Lipid Metabolism, Digestion Absorption of Fat, Oxidation of Fatty acids, Ketosis, Lipoprotein metabolism classification of lipoprotein, Important lipid profile tests.

Proteins: Aminoacids, peptides and proteins: classification of proteins: Digestion and absorption of proteins, Formation of Urea, Transamination, Deamination, Plasma Protein, Liprotropic factors.

Nucleic Acid Nucleon Proteins: Definitions, Biological role of nucleic acid, nucleoproteins, Purnies and pyrimidines, Formation of Uric Acid.

2. Organ Functions and Enzymology **18**

(a) **Organ Functions.**

Kidney Functions Test (KFT): General consideration, Evaluation of KFT.

Liver Functions Tests (LFT): Liver functions, investigations of liver functions, uses of liver functions tests.

Pancreatic Function Test: Function of pancreas, pancreatic juice, pancreatic function tests.

Test for Gastric Function: General consideration: Chemical analysis of gastric contents, Clinical Significance, Tubeless gastric analysis.

Tests for Thyroid: Thyroid functions, importance of thyroid functions tests.

Cardiac Profile Test: General consideration, cardiac functions, Ischemic heart diseases, cardiac profile tests.

(b) **Enzymes:** Definition and Importance, Nomenclature and classification of enzymes. Specific enzymes, factors influencing enzyme activity; coenzymes, clinical enzymology, definition and importance of alkaline phosphatases, acid phosphatases, amylases, Transaminases (GOT, GPT) Lactic dehydrogenase.

3. Applied Clinical Chemistry **14**

- Importance of trace elements.
- Iron Metabolism/General consideration of Importance of Na+, K+, Cl,
- Ca+ fluoride, magnesium.
- Balanced diet.
- In born errors of metabolism, General Consideration & Clinical importance, Carbohydrate, Protein, Lipid, Nucleic acid Matabolisms, Acid base balance and disturbance of acid base balance, clinical importance.
- Vitamins: General consideration, clinical importance, vitamin deficiencies.

Hormones

- Introduction, General Mechanism of actions, Hormones of Thyroid Function, Pituitary Functions, Adrenal Functions, Male and Female hormones, function, clinical importance.

Jaundice

- Bile pigment derangements, Clinical Significance, Prehepatic, hepatic and post hepatic jaundice, applications of clinical Laboratory tests to differentiative types of Jaundice.
- Normal and abnormal value of clinical chemistry in relation of human diseases.
- General consideration and interpretations.

PRACTICAL

Time: 2.5 Hours ***Marks: 50***

Demonstrations

1. Analysis of gastric juice. **4**
2. Pancreatic functions tests (Serum Amylase). **4**
3. Glucose tolerance tests. **4**
4. Total Serum Proteins, Album globulin ratio. **4**
5. SGOT/SGPT, Alkaline phosphates tests. **4**
6. Hormone Assays: T_3, T_4, TSH. Oestrogen, Progestrone, Prolactin. **4**
7. Lipid Profile. **4**
8. CPK–MB. **4**
9. Paper and agar gel electrophoresis. **4**
10. Serum Electrolytes Na+Cl'. **4**
11. Demonstratino of Semiautomated/Fully automated biochemical analysers, Blood gas Analysers ELISA Beaders. **2**
12. Demonstration of disposal of Laboratory waste products and infected material. **2**
13. **Estimations of** **6**
    1. Blood Urea.
    2. Blood Sugar
    3. Serum Creatinine.

4. Serum Uric Acid.
5. Serum Cholestrol.
6. Serum Bilirubin.

Marking Scheme **50**

Practical (One exercise only). **30**

Class Record. **10**

Viva.

Note: Certification of Class Record and maintenance of each practical record to be submitted to external examiner.

CLASS–XII
OPTIONAL
MICROBIOLOGY (MLT) (662)
THEORY

Time: 2.5 Hours ***Marks: 50***

A. Bacteriology **25**

1. Normal flora of microorganisms in human body.
2. Gram positive and Gram Negative Cocci

   (a) Staphylococci: Morphology, classification, pigment production, coagulase test, Laboratory diagnosis.

   (b) Streptococci: Morphology, staining, cultural characteristics, pathogenicity and laboratory diagnosis.

   (c) Pneumococci: Morphology, staining characteristics, biochemical reactions, pathogenicity and laboratory diagnosis.

   (d) Meningococci: Morphology, staining characteristics biochemical reactions, pathogenicity, laboratory diagnosis.

   (e) Gonococci: Morphology, staining characteristics, biochemical reactions, pathogenicity, laboratory diagnosis.
3. Corynebacterium Diphtheriae: Morphology, staining characteristics, biochemical reactions, Diphtherical toxin shick test, laboratory diagnosis.
4. Mycobacterium tuberulosis and leprae: Morphology, cultural characteristics, diagnosis of amoebiosis Tuberculim test, Lab dianosis: a typical myobactorium, lepromin test.
5. Gram Negative bacilli (aerobic): morphology, cultural characteristics, pathogenicity and laboratory diagnosis of Salmonella, Shigella, E. coli, Klebsiella, Proteus, Psudomonas, Vibrio, EL TOR Vibrio.
6. Gram Positive bacilli (anaerobic): Morphology, cultural characteristics, pathogenicity clostradum, welchii, & lab diagnoisis of clostradium Tetani.
7. Methods: Laboratory Diagnosis of common bacterial infections:

   (a) Respiratory tract.

   (b) Urinary tract.

   (c) Urogenital.

   (d) Gastrointestinal tract.

B. Virology and Immunology **15**

Virology: Basic Fundamentals of Viruses: General properties of virus, classification, Cultivation and clinical importance of pathogenic viruses, General information: HIV (Human Immuno Deficiency Virus), Hepatitis B Virus, Non A and Non B Virus).

Immunology: General Principles and Fundamentals of Antigen, Antibodies, Immunoglobulins Apparatus, Immunoresponses, Antigen Antibody reactions and their application in diagnosis of diseases.

C. Parasitology **10**

Diagnosis of Protozoology: Morphology, Identification.

1. Phylum Protozoa

(a) Entamoeba Histolytica: Laboratory diagnosis of amaebiosis.

(b) Giardia Lambia.

(c) Blood and tissue flagellates – leishmaniasis.

(d) Plasmodium (genus) Cerebral malaria, Black water fever.

Helmenthology

2. **Phylum Nemathelminthes:** General characteristics, identification and Diagnosis of:

(a) Oviparous: Ascaris humbricoids, Trichuris Trichura, Ancylostoma Duodenale, Entrobius, Vermicularis.

(b) Viviparus: Dracunculus medinesnsis, Wucheria bancrofti, Brugia malayi, Trichenella Spiralls.

3. **Phylum Platyhelminthes:** General Characteristics, identification and diagnosis of:

(a) Cestodes, (Tape worms) Genus (a) Taenia, T. Saginita, T. Sodium (b) Hymenolepis H. Nana.

(b) Tremetodes: Schistosome.

PRACTICAL

Time: 2.5 Hours ***Marks: 50***

A. Bacteriology **30**

Demonstrations

(a) Preparation of various, simple, basic enriched and selective media.

(b) Procedure of sterilization and disinfections in Microbiology Laboratory.

(c) Disposal of infected and wastes product of Laboratory.

(d) Procedure of Registration, Receipt and processing of specimen of: Urine, Sputum, Stool, Various body fluids, Throat Swabs, etc. for identification and isolation of microorganisms.

(e) Investigation of 'hospital infection' materials, routine procedures for identification and isolation of microorganism.

(f) Bacteriological examination of water, milk, air.

(g) Anaerobic culture, identification and process of various materials.

(h) Demonstration of various biochemical reactions including sugar fermentations.

(i) Antibiotic disc preparations and reporting of sensitivity of organisms.

(j) Concentrations of techniques of stool preparation for identification of various Ova and Cysts, Record of morphology of each one of them.

(k) ELISA Tests for antigen and antibody detections.

Practicals

1. Identification of morphology of various bacteria, growth on:
   (a) Nutrient Agar.
   (b) Blood Agar.
   (c) Mc-Media.
   (d) DCA (Desoxy Cholate Citrate Agar).
   (e) Potassium tellurite Media.
   (f) L.J. (Lowen's in Jenson's) Media.
2. Preparation and record of staining characters of bacteria from growth agar media.
3. Hanging drop preparation and reporting of motility from broth (media).

B. Immunology **20**

1. Preparation of gel slides for agar gel diffusion, Counter current Immuno electrophoresis.
2. Widal test.
3. VDRL test.
4. Rheumatoid Arthritis (RA) test.
5. C–Reactive Proteins (CRP) test.

Marking Scheme

Section wise distribution

A.	Bacteriology (One exercise only).	30	
B.	Immunology (-do-).	10	
C.	Class record.		10*
D.	Viva.	10	

One–the–Job (OJT)

Full time working experience to be gained in any approved laboratory having facilities as per recognised curriculum. OJT should be held in Hospitals/Nursing Homes approved by Director Health Services/Director Medical Services/Director Medial Education (DME). Later on subject to approval of Para Medical Council of India whenever it come into existence.

(i) One month (4 weeks) at the end of class XI preferably after annual examination.

(ii) One month (4 weeks) before completion of class XII preferably during December January.

The training imparted by recognised teacher as per the norms, to be supervised and certified by Course Director. A Certificate of satisfactory completion of OJT will be issued by recognised hospital authorities in prescribed format to be finally countersigned by Course Director before the candidate appears for XII examination. The students of both the years during the OJT will maintain a workbook (as per appendix).

On–the–Job Training Phase–I (4 weeks duration)

Essential

1. Use and Practice of microscopes, calorimeters, water bath, incubators and autoclave, Centrifuge, analytical balance and maintain then for daily use.
2. Collection of venous and capillary blood samples from patients (at least 10 patients).

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* Certification of Class Records and Maintenance if each Practical record demonstrations and practicals to be submitted to external examiner.

3. Preparation of anti coagulants at least once.
   (a) Double Oxalate (b) EDTA
   (c) Sodium Citrate (d) Flouride
4. Cleaning of glass wares at least once: Wintrobe tubes, ESR–Westergren's tube, pipetters, glass slides, vials.
5. Hb Estimation by Sahli's cyanamethahemoglobin methods (6 sample by each candidate).
6. Urine routine qualitative Examination, (5 sample by each candidate).
7. Stining of Slides by Giemsa/Leishman Stains, (5 sample by each candidates).
8. Staining of Slides by Gram's method, (5 sample by each candidates).
9. Staining of slides by ZN Stains, (5 sample by each candidates).
10. HE Staining of Tissue sections (5 slides).

Desirable

1. Exposure to hospital environment various specialities, visit to various laboratories and organisation system.
2. Complete understanding of Registration & Receipt system of samples, flow system of sample till report of samples of various kind.
3. Disposal of waste material of laboratories visit to insinuators.
4. Knowledge of Hospital Hazard and Safety Procedures.
5. Exposure to Semi Automation and Automation techniques.
   (a) Haematology Analysers.
   (b) Biochemistry Analysers.
   (c) ELISA Readers.

On–the–Job Training (Phase–II) (4 week duration)

Essential

(At least 5 samples of each estimations)

1. Haemogram Estimation (Hb, TLC, DLC, ESR, PEV).
2. BT, CT, Platelet count.
3. Blood Grouping (ABO, Rh typing).
4. Cross Matching.
5. Complete Routine Urine Examination and reporting results.
6. Stoll Examination and reporting of at least 4 different types of Ova and Cyst in the sample (2).
7. Urine Examination for Pregnancy Test.
8. Semen Examination and reporting of sample.
9. Estimation of Blood Sugar, Blood Urea.
10. Serum Chemistry: (5 sample each). Serum Creatimine, Serum Cholestorl, SGOT/SGPT, Alkaline Phosphate.
11. Preparation and staining of smears sputum for AFB, Pus Smears for Gram's Staining.
12. Processing of Urine, Blood for Culture and Sensitivity.
13. Widal test.
14. VORL test.
15. Agar get preparation of slides for CIEOP.AGD.
16. H & E Staining of tissue.

17. Vaginal Smear preparation for screening of Trichomonas Vaginals and Momliasis.

Desirable (At least once)

1. Observation of working of Haematology Analysers, Semi automated/Fully automated Biochemistry analysers, ELISA reader–Use for HIV, Hormone Assays.
2. Blood Donor Selection, Blood donation camp/donation procedure, preservation storage and issue of blood to recipient.
3. Demonstration of Lipid Profile and cardiac Profile investigations using kits.
4. Demonstration of Coagulation Profile PT, PTTK, Anti–III etc.
5. Stock culture maintenance of various micro–organism.
6. Scrotyping of various entcrobactcriacc grou. Specifically Esch, Colo, Vibrio;, Salmonalla, Shigella Organisms.
7. Special Staining of Histopathology–Reticutin, PAS, Mucin.
8. Fine Needle Aspiration Cytology (FNAC) at various tissues (observation of at least 5 patients).

CERTIFICATE OF ON JOB TRAINING

Certified that Miss/Shri .....
D/o/S/o..... Roll No. ..... of school .....
..... has satisfactorily complete the On–the–Job Training of 8 weeks from dated ..... to ..... in Phase–I and from dated ..... to ..... in Phase–II at ..... under supervision of recognised expert(s) as per norms laid down.

Name of Supervising Teachers(s) .....

Subject.....

Signature

Head of the Department .....

Head of the Institute .....

COUNTERSIGNED
COURSE DIRECTOR
VOCATIONS (MLT COURSE)

ANNEXURE

On Job Training
Worksheet (Day–to–day Work)

Name of the student ..... Roll No. .....

School ..... Class .....

Day/Date of Practical	Name of the Practical/ Demonstration Performed/ seen	Number of Practical completed in each category record of patients, date, name, OPD no(s).	Name of the Laboratory/ hospital/ institution with date(s)	Name and signature of Supervisor/ tutor	Remark

LIST OF RECOMMENDED BOOKS

A Medical Laboratories for Developing Countries.

M. King, ELBS Series, Oxford University Press, Reprint 1990.

A Hand Book of Laboratory Technology.

V.H. Talib WHO Sponsored, CBS Publishers, 1994, 2nd Edn.

Naidainik Chikitsa Vigyan Prayogshala Taknik Pustika.

V.H. Talib, WHO Sponsored, Inter Print Publishers, 1992 Edn.

A Text Book of Biochemistry.

S.P. Singh, 1993, Edn. CBS. Publishers, New Delhi.

Anatomical. Atlas of the Human Body.

MAH Siddiqui, 1989 Edn.

A Text Book of Histology – Colour atlas and test 2nd End.

Krishna Garg. Mohini Kant 1991, Reprint.

Chaurasia's A Hand Book of General Anatomy 2nd End. Sixth Reprint 1994.

Biochemistry and Clinical Pathology (Theory & Practical).

K.K. Pollai, J.S. Qadry, Ist Edn. 1994.

Haematology for Students.

V.H. Talib, S. K. Khurana, CBS Publishers, New Delhi. 1994, Edn.

Blood Banking & Transfusion Medicine.

V.H. Talib, A.B. Dutta, First Edn, 1994 (Under Print).

Clinical Biochemistry Principles and Practice.

Praful. B. Godkar, Ehalani Publishing House, Bombay, 1994, Edn.

Laboratory Medicine (Clinical Pathology) for Students and applications.

V.H. Talib, S.K. Khurana, 1st Edn. 1994, (Under Print).

A Hand Book of Microbiology for Students.

P.S. Bisen, Kavita Verma, 1st, Edn. 1994.

Medical Parasitology.

K.D. Chatterjee, 1990, Edn.

Paracitology (Protozoology & Halminthology).

Sood, Fourth Edn. 1993.

Medical Parasitology for Students.

V.H. Tablid, 1st Edn. 1994 (Under Print).

Anatomy and Physiology for Nurses (Edn).

E.C. Pearce 16th Edn. Oxford University Press.

Medical Laboratory Technology (Edn.)

Manual L. Mukherjee, 1988, Tata, Mc Graw Hill (3 Volumes).

Practical Biochemistry 3rd Edn.

S.B. Singh, 3rd Edn. 1994.

A Hand Book of Histological and Histochemical Techniques.

S.K. David, Fourth Edn. 1991.

Population Dynamics.

Dr. C.V. Prasad, & Prof. P. Raja Ram.

LIST OF REFERENCE BOOKS FOR FURTHER READING

Books	Author's Name
Clinical & Diagnosis Management.	Laboratory Methods, Todd and Sandford Henry, 10th Edn. 1991. H.B. Saunder's Company, Philadelphia–London.
Anatomy and Physiology for Nurses.	TWA Gleniser, Jean RW Ross 1991 Edn. 3rd Edn.
Human Physiology Systemic and Applied.	Shalya, CBS Publishers, 1st End. 1994.
Text Book of Microbiology.	Anant Narayan, 1992, Edn.
Practical Clinical Biochemistry.	Harold Varley, 4th Edn. 1969.
Medical Laboratory Technology.	Lynch, GSM, 1990, Edn.
Medical Microphilogy.	Maekie & Mckartney, 13th Edn. ELBS, Services, 1989.
Basic Medical Laboratory Technology.	Ed. Kirk, Peel, James, Lewis, & Waft, 3rd Edn. 1988, Pitman.
Gel Immuno–diffusion Techniques in Research & Laboratory Medicine.	S.S. Kelkar. P.M. Khare, 1984, Edn. Popular Prakashan Bombay.
Laboratory Diagnosis in Medicine.	Asmt Hossian, Reprint Edu. 1994.
N.M.S. Haematology.	Emmanel. C. Besa,PM Cato Lano, Jaffery A. Kant. L.C. Jefereis, Harwal Publishing Philadelphia-London, Sydney, Tokyo, 1922, Edn.
A Text Book of Biochemsitry.	A. S. Saini, First Edn. 1994.
Immunology.	Ivan Rolt, Jonathan Brastaff, David Male, C.V. Mosby Company, St. Lonis, Toronto, 1992, Edn.
AIDS-Diagnosis Treatment and Prevention.	Anita Kotia, Govind Srivastava, First Edn. 1994.
Practical and Clinical Immunology.	Volume I, II, Second Edn. G.R. Talwar, S.K. Gupta, 1992.

LIST OF EQUIPMENTS REQUIRED TO IMPART TRAINING AT MEDICAL COLLEGE HOSPITAL, INSTITUTES

Minimum Requirements: (for a batch of 30 students).

A. Basic Instruments.

B. Instruments for Demonstrations.

C. Reagents & Chemicals, Glassware.

A. Basic Instruments (Approx. Cost 5 lacs)

1. Microscope with built in illumination. Monocular – 6

Binocular – 2

2. Calorimeter. – 1
3. Photoelectric colourimeter. – 1
4. Incubator – 1.
5. Hot Air Oven. – 1
6. Autoclave – 1.
7. Simple Balance. – 1
8. Haemoglobin meter Colorimetric. – 1
9. Single Pan Balance. – 1
10. Haemocytometer (Hellige). – 10
11. Water bath (Serological). – 2
12. Centrifuge Machine angle rotator with win tube adaptor, time & speed regulator. – 2
13. Inoculation Chamber Rotary. – 1
14. Microtome. – 1
15. ELISA Reader & Washer. – 1
16. Distillation Plant All Glass Double. – 1
17. Single Distillation. – 1

B. Instruments for Demonstrations (Approx. Cost 6 lacs)

1. Haematology Analyser (semi automated). – 1
2. Haematology Analyser (fully automated). – 1
3. Biochemistry Analysers (semi automated). – 1
4. Biochemistry (fully automated). – 1
5. ELISA Reader (automated). – 1
6. Electrophrasis Apparatus. – 1
7. Histo Kinett. – 1
8. Densitometer. – 1
9. Freezing Microtome. – 1
10. Tissue Processor. – 1
11. Mclntosch Apparatus for Anaerobic Culture. – 1
12. Laminar flow System. – 1

C. Reagents/Chemicals, Glass Wares

As per requirements of Diagnostic Laboratories for 40–50 samples per day.

CLASS–XI
ELECTIVE
CHILD HEALTH NURSING (731)

Learning Objectives

On completion of the course the student will be able to:

1. Assess growth and development of a child at different ages.
2. Describe nutritional needs of different age group of children.
3. Provide care to sick children during their common illness.

THEORY

Time: 2.5 Hours ***Marks: 50***

1. Growth & Development — 15

- Introduction to Growth and development.
- Factors affecting growth and development.
- Growth and development in infants and children: Assessment.
- Physical psychological and social development of children.
- Monitoring and recording of growth and development of infants and children.
- Care of infants and children – Play hygiene, emotional needs training for bowel and urination.
- Accidents: causes, precautions and prevention.
- Congenital anomalies.

2. Nutrition of Infants and Children — 15

- Exclusive Breast feeding.
- Nutritional requirements.
- Complementary feeding.
- Problems of feeding.
- Breast feeding counselling.
- Infant feeding and HIV.
- Baby friendly hospital initiative.

3. Care of the Sick Child — 20

- Common childhood disorders.
- Signs, symptoms and management.
- Vaccine for preventable diseases.
- Acute Respiratory tract infections.
- Diarrhoea vomiting constipation.
- Tonsillitis and mumps.

- Ear infection.
- Worm infestation.
- Accidents and injuries.
- Skin infections.
- Fever- malaria, measles.
- IMNCI strategy.

PRACTICAL

Time: 2.5 Hours ***Marks: 50***

Suggested Activities for Evaluation

Case Studies

- Brest feeding techniques.
- Preparation of ORS.
- Preparation of complementary feeds.
- Assessment of growth and development of children.

CLASS–XI
ELECTIVE
COMMUNITY HEALTH NURSING AND HEALTH PROMOTION (732)

Time: 2.5+2.5 Hours ***Mar***

Learning Objectives

On Completion of the Course the Student will be able to

1. Describe the concept of community health primary health care.
2. Understand health policies, plans and programme of the country.
3. Understand the concept of community.
4. Appreciate the role of the health team.
5. Demonstrate home visit techniques and practices in the community.
6. Describe structure, function, characteristics and administrative set up of a community.
7. Identify teacher, resources persons, community-based organizations, NGOs, and local resources.
8. Identify community health needs and problems.
9. Describe concepts and methods of communication for health information.
10. Describe the purpose, principles and methods of health counseling.

I. COMMUNITY HEALTH NURSING
THEORY **24**

1. Concept of Health

- Health and its changing concepts.
- Determinants of health.

- õ Determinants of health.
- õ Primary health care, definition components significance community application.

2. Community Health Practices

- õ Health concept of people and health care providers.
- õ Health behaviours beliefs and cultural practices of community.
- õ Ethics and behaciour related to community practices.
- õ Method of home visiting.

3. Health Problem and Policies

- õ Overview of health problem of communities in India.
- õ Trends and development to national health programmes and policies.
- õ National health programmes and its implementation at community level.
- õ Role and functions of Accredited social health Activists (ASH) Anganwadi worker Dai etc.

4. Health Organization

- õ Organization of SC PHC, CHC and district hospital.
- õ Organization of health care delivery system at different levels.
- õ Referral system.
- õ Health agencies international WHO, UNICEF, UNFPA, UNDPA World Bank, FAO, DANIDA, European Commission Red Cross, US aid, UNESCO, Colombo Plan, ILO CARE etc.
- õ National Indian Red Cross Indian Council for Child welfare, family planning association of India etc.
- õ Non-Governmental organizations.

5. Role of Health Team

- õ Team concept and functions of the health team.
- õ Role and Responsibilities of ANM/FHW.
- õ Code of ethics for ANM.

6. Structure of Community

- õ Rural community characteristics, development major rural problem.
- õ Urban community characteristics change and adjustments to urban environment major urban problem.
- õ= Administrative set up.
- õ Function of panchayat.
- õ 73rd and 74th amendments to constitution.
- õ Role of panchyat in health.
- õ Structure of an urban community slum.
- õ Social group organizations leaders.
- õ Community resources.

7. Dynamics of Community

- õ Social processes individual and process of socialisation.

- Interaction between different social group in the village.
- Traditions and customs and their influence on health.
- Social stratification influence of class caste and race on health and health practices.
- Family and marriage type.
- Changes & legislation on family and marriage in India marriage acts.

8. Community need an Assessment

- Scope and methods of community need assessment.
- Survey planning preparation of tools questionnaires. Interview schedules check list etc.
- Community survey principles and methods data collection conducting interviews focus group discussions (FGD) and case studies.
- Participatory learning for action (PLA).
- Analysis of data preparation of report.

9. Communication Methods & Media

- Principles methods of communication.
- Inter personal relationship (IPR) communication.
- Inter personal relationship (IPR) communication Contents.

10. With Different Groups and Health Team Member

- Types and use of AV aids.
- Use of local folk methods and media for disseminating health messages.
- BCCI (Behavioural change communication) IEC (information education and communication) Aims, Scope concept and approaches.
- Teaching learning process concept characteristic steps of learning process concept characteristic steps of leaning characteristic of learner.
- Principal methods of teaching.
- Planning of health education activities.
- Role and responsibilities of ANM's/Health workers in BCC.

11. Counseling

- Concept, principles and Techniques of counseling.
- Identifying needs and areas for counseling in the community.
- Role of ANM/ Female Health worker as counselor.

12. Community Based Rehabilitation

- Health conditions meeting rehabilitation.
- Community Resource available.
- Educate individuals family and community.

PRACTICAL **10**

Suggested Activities for Evaluation

- Health organizational chart.

- Return demonstration of home visit.
- Field visits.
- Preparation of IEC material.
- Demonstration of counseling technique.
- Village mapping .
- Community survey.

II. HEALTH PROMOTION THEORY

26

Learning Objectives

On Completion of the Course the Student will be able to

1. Explain importance of nutrition in health and sickness.
2. Promote nutrition of a individual family and community.
3. Explain principles of hygiene and its effect on health.
4. Describe hygiene for self and individuals.
5. Describe importance of environmental sanitation and waste management.
6. Promote mental health of individual family and community.

A. Nutrition

1. Essential Nutrients

- Importance of nutrition in health and sickness.
- Essential nutrients, function, sources and requirements.
- Classification of foods and their nutritive value.
- Normal requirements at different ages.
- Balanced diet for different diet for different age group.

2. Nutritional Problems / Nutritional Deficiencies

- Deficiencies correction, treatment and referral protein energy malnutrition.
- Vitamin and mineral deficiencies. Nutritional anemic in women.
- Under five nutrition.
- The role of ANM's/FHW/AWWs in supplementary food.
- Special diets of individuals for different age group.

3. Nutritional Assessment

- Methods of nutritional assessment of individual and family mother and child.
- Identification of local food sources and their value in enriching diet.
- Food fads, taboos, customs and their influence on health.

4. Promotion of Nutrition

- Planning diets and special diets for a family.
- Methods of using locally available foods for special diet.

- õ Principle and methods of cooking.
- õ Promotion of kitchen gardens.
- õ Food hygiene and safe reparation.
- õ Storage and preservation.
- õ Food adulteration.
- õ Precautions during festivals and melas.

PRACTICAL 10

Suggested Activities for Evaluation

- õ Cooking of special diet.
- õ Nutrition educating to a group.
- õ Planning diet of a family assigned.

B. Human Body and Hygiene

1. The Human Body

- õ Structure and functions of human body.
- õ Body systems and their functions digestive system respiratory system genitor urinary system cardiovascular system, nervous system muscular system, endocrine system, special sensory organs.

2. Hygiene of the Body

- õ Personal and individual hygienic.
- õ Care of mouth skin, hair and nails.
- õ Sexual hygienic.
- õ Menstrual hygiene.
- õ Hygiene and comforts needs of the Sick care of skin bath sponging back care, care of Contents.
- õ Pressure points position changing.
- õ Care of hair: hair wash.
- õ Care of hand and nails: hand washing.
- õ Care of eyes: eye wash.
- õ Mouth care.
- õ Elimination care of bowels and bladder.

3. Optimal Functioning of the Body

- õ Basic human needs.
- õ Rest, sleep, activity , exercise, posture etc.
- õ Food, eating and drinking habits.
- õ Participation in social activates.
- õ Self- actualization and spiritual need.
- õ Interpersonal and human relations.
- õ Lifestyle and healthy habits.

PRACTICAL 10

Suggested Activities for Evaluation

- Preparation of anatomy practical book.
- Return demonstration of personal hygiene including care of various organ of body.

C. Environmental Sanitation

1. Environmental Sanitation

- Environment and ecology for healthy living basic sanitary needs.
- Air, sunlight and ventilation.
- Home environment smoke, animals water drains and toilets etc.

2. Safe Water

- Source of water & characteristic of safe water sources of contamination and prevention.
- Purification of water for drinking methods small and large scale.
- Disinfections of well tube well tank and pond in a village.
- Waterborne diseases and prevention.

3. Disposal of Excreta and Waste

- Methods of excreta disposal type of latrine.
- Handling animal excreta.
- Methods of waste disposal.
- Hazards due to waste.

4. Community Participation

- Drainage and preparation of soak pits.
- Maintaining healthy environment within and around village cleaning and maintenance of village drains ponds and wells.
- Common waste excreta and animals waste disposal in the village.

PRACTICAL 10

Suggested Activities for Evaluation

- Purification of water at home, community.
- Disinfections of a well/tube well.
- Construction of a small scale soak pit.
- Health education for use of sanitary latrine.

D. Mental Health

1. Mental Health

- Concept of mental health.
- Body mind relationship.
- Factors influencing mental health.
- Characteristics of a mentally healthy person.

- Developmental tasks of different age groups.
- Different defense mechanisms.

2. **Maladjustment**
   - Features of a maladjusted individual.
   - Common causes of maladjustment.
   - Counseling an individual family and community.

3. **Mental Illness**

   Identify abnormal behaviour.
   - Types of mental illnesses and treatments.
   - Early detection and referral of mentally ill.
   - Prevention of mental illness.
   - Home care and counseling.
   - Refer psychiatric emergencies.

4. **Old Age Care**
   - Process of ageing – physical psychological changes.
   - Needs and problems.
   - Care of elderly at home.
   - Rehabilitation and agencies of caring elderly.

PRACTICAL 10

Suggested Activities for Evaluation

- Assessment of mental health status of individual.
- Care plan for an elderly person at home.

CLASS–XI
ELECTIVE
PRIMARY HEALTH CARE NURSING (733)

Time: 2.5+2.5 Hours ***Mar***

Learning Objectives

On Completion of the Course Student will be able to

1. Explain concept of infection and causation of disease.
2. Describe body defense mechanisms and development of immunity against diseases.
3. Perform immunization effectively.
4. Describe different methods of disinfections and sterilization.
5. Describe common communicable diseases and their management.
6. Explain prevention of common communicable diseases and their control.
7. Describe care of the sick in community with common ailments and refer if required.

8. Explain recognition of conditions related to different body systems.
9. Describe and demonstrate routes of administration of drugs.
10. List common drugs used for emergencies and minor ailment, their indications, dosage and actions.

THEORY 10

A. Concept of Disease

- õ Concept and definition of illness.
- õ Disease causation.
- õ Classification of diseases.

1. Infection

- õ Meaning and types of infection.
- õ Causes of infection.
- õ Classification and characteristics of micro organisms: Pathogenic and Non-pathogenic.
- õ Incubation period and spread of infection.
- õ Transmission.
- õ Factors affecting growth and destruction of microbes.

2. Immunity and Body Defense Mechanisms

- õ Body's defense mechanism.
- õ Immunity – concept.
- õ Hypersensitivity: Antigen antibody reaction.
- õ Types of immunity.
- õ Types of vaccines.
- õ Storage and care– cold chain maintenance.

3. Immunization

- õ Immunization against different infections – immunization schedule.
- õ Injection safety.
- õ Methods of administering vaccine.
- õ Sterilization of syringes and needles.
- õ Immunization in the community.
- õ Immunization Hazards.
- õ Precautions while giving vaccines.
- õ Special immunization drives and programmes.

4. Collection of Specimen

- õ Principles and methods of collection of specimens and handling body discharges.
- õ Collection of specimens of blood, sputum, urine, stool.
- õ Safe disposal of body discharges. Records and reports.

5. Disinfection and Sterilization

- Principles and methods of antisepsis, disinfection and sterilization.
- Methods of disinfecting different equipment's.
- Methods of sterilizing different equipments.

6. **Waste Disposal**
   - Waste disposals- infectious and non- infection: concepts, principles, and methods at different levels.

PRACTICAL 10

Suggested Activities for Evaluation

- Demonstration of sterilization of syringes and needles / using pressure cooker / small autoclave.
- Demonstration of preparation of Malaria slides.
- Techniques of vaccination.
- Assignment on cold chain system.
- Prepare poster / chart on immunization schedule.
- Demonstrate different methods of waste disposable.

B. Communicable Diseases

THEORY 10

1. **Introduction to Communicable Diseases**
   - Common communicable diseases; Epidemiological concepts- incidence and prevalence, mortality and morbidity.
   - Levels of prevention.
   - Control and prevention of communicable diseases General measures.
   - Surveillance, isolation, notification, reporting.

2. **Communicable Diseases**
   - Signs, Symptoms, care and prevention of the following:
     - Diptheria, pertussis, tetanus, poliomyelitis, measles and tuberculosis.
   - Chicken pox, mumps, rubella, enteric fever, hepatitis, rabies, malaria, dengue, filarial, Kala-azar trachoma, conjunctivitis, scabies, STDs and HIV / AIDS.
   - Encephalitis.
   - Leptospirosis.
   - Acute respiratory infection.
   - Diarrhoeal diseases.
   - Worm infestations.
   - Leprosy.
   - Role and responsibilities of health worker / ANM.

3. **Care in Communicable Diseases**
   - Care of patients with communicable diseases.
   - Isolation methods.

- Standard safety measures (Universal precautions).
- Health education and messages for different communicable diseases.
- Role and responsibilities of health worker / ANM.

4. **Epidemic Management**
   - Definitions and causes of epidemics.
   - Epidemic enquiry in a community and epidemic mapping.
   - Relief work and role of health worker / ANM.

PRACTICAL 10

Suggested Activities of Evaluation

- Preparation of surveillance report.
- Conduct Health education.
- Demonstration on:
  - Standard safety measures in nursing Practice.

C. Community Health Problems

THEORY 10

1. **Care of the Sick in the Community**
   - Common health conditions in the community – danger signs of illnesses.
   - Health assessment: Taking history, physical examination: vital signs, weight, height:
     - recognition of abnormalities.
   - Identification of health problems.
   - Management of the sick: home and community nursing procedures, care of the sick, referral.
   - Health education: individual and family.

2. **Fever**
   - Vital signs; Temperature, pulse, respiration, blood pressure.
   - Temperature maintenance and the physiology of fever.
   - Fever: Types and stages.
   - Causes of fever – common conditions causing fever, malaria, typhoid, acute respiratory infection (ARI) etc.
   - Nursing management of patient with fever.
   - Alternate system of medicine.

3. **Respiratory Problems**
   - Common respiratory problems: types, classifications- cold and cough, ARI, asphyxia, tonsillitis, asthma, bronchitis pneumonia and tuberculosis.
   - Causes, sign and symptoms, treatment of respiratory problems.
   - Management: Role and responsibilities of ANM/health workers in care of patients with respiratory problems including Home care remedies.

- Integrate accepted practices of AYUSH.

4. **Aches and Pains**
   - Causes and nursing management of: tooth, ache, ear ache, abdominal pain, headache, joint pains.
   - Management as per the standing orders and protocols.
   - Role of ANM/health worker in the community including home care remedies.
   - Integrate accepted practices of AYUSH.

5. **Digestive Problems.**
   - Indigestion, anorexia, vomiting, distension and Constipation.
   - Hemorrhoids, hernia, ulcer and intestinal obstruction.
   - Role of ANM/health worker in the community including home care remedies.
   - Integrate accepted practices of AYUSH.

6. **Urinary Problems**
   - Signs and symptoms of renal conditions.
   - Retention of urine, renal colic, edema.
   - Role of ANM/health worker in the community including home care remedies.
   - Integrate accepted practices of AYUSH.

7. **Cardiovascular Problem**
   - Signs and symptoms of cardiac conditions and blood related problem: heart attack, chest pain, anemia, hypertension and leukemia.
   - Care of a cardiac patient at home.
   - Role of ANM/ health worker in the community including Home care remedies.
   - Integrate accepted practices of AYUSH.

8. **Diseases of the Nervous System**
   - Signs and symptoms of neurological problem – headache, backache and paralysis.
   - Care of a patient with stroke at home.
   - Care of pressure points, back care changing of positions, active and passive exercises, body support to prevent contractures.
   - Role of ANM/ health worker in the community including home care remedies.
   - Integrate accepted practices of AYUSH.

9. **Metabolic Disease**
   - Diabetes – signs and symptoms, complications diet and medications.
   - Skin care, foot care.
   - Urine testing and administration of insulin injection.
   - Integrate accepted practices of AYUSH.

10. **Diseases of Musculo Skeletal Systems**
    - Signs and symptoms of sprain tear of ligaments and arthritis.
    - Integrate accepted practices AYUSH.

11. **Care of Handicap**

- õ Handicaps – different types.
- õ Counselling for prevention of certain handicaps.
- õ Understandings the handicapped person.
- õ Helping family to ensure need based care.

PRACTICAL 10

Suggested Activities for Evaluation

Demonstration of.

- õ Urine testing for albumin and sugar.
- õ Urinary catheterization.
- õ Local application of cold and hot.
- õ Plain water enema.
- õ Checking of B.P. and TPR.
- õ Disease conditions.

D. Primary Medical Care

THEORY 10

1. **Types of Drugs**

- õ Different Systems of medicine: allopathic and AYUSH.
- õ Classifications of drugs.
- õ Forms and characteristics of drugs.
- õ Abbreviations used in medication.
- õ Administration of drugs: policies and regulation, as per protocols and standing orders.
- õ Calculation of dosage.

2. **Administration of Drugs**

- õ Routes of administration – Oral, parental (intradermal, intramuscular, subcutaneous, Intra venous), rectal, local and others.
- õ Administration of drugs: Precautions, principles.
- õ Observations and recording.

3. **Drugs used in Minor Ailments**

- õ Common drugs for fever, cold and cough, aches and pains etc.
- õ Drug kit in the sub centre, content and its use.
- õ Storage and care of drugs.

4. **Common Emergency Drugs**

- õ Methergine, misoprostol injection oxytocin, IV fluids, antibiotics, injection and magnesium sulphatederiphylline, avil and other antihistaminic, pethedine, vitamin K, antirabies vaccine, anti snake venoms as per the protocol.

- Precautions for administration.
- Storage and Care of emergency drugs.

PRACTICAL 10

Suggested Activities of Evaluation

- Preparation of list of common drugs used in sub centre, their action dosages and use.
- Demonstration of administration of medication by different routes.
- Drug study.

E. First Aid and Referral

THEORY 10

1. **Need for First Aid**
   - Principle of first resources.
   - Mobilization of resources.
   - First aid kit & supplies.
   - Bandages: Types, Uses.
   - Principle and methods of bandaging.
2. **Minor Injuries and Ailments**
   - Cuts and wounds: types, principles and first aid care.
   - Foreign bodies.
   - Burns and scalds types, principles and first aid care.
   - Health education and referral.
   - Role of ANM/health worker.
3. **Fractures**
   - Skeletal system and different bones.
   - Fractures: Types, Causes, signs and symptoms, first aid care.
   - Methods of immobilization and transportation.
4. **Life Threatening Conditions**
   - Bleeding.
   - Drowning.
   - Strangulation, suffocation and asphyxia.
   - Loss of consciousness.
   - Cardio respiratory arrest.
   - Convulsions.
   - Foreign bodies.
   - Chest injuries.
   - Shock and allergic conditions.
   - Poisoning, bites and stings.

- Stroke.
- Heat stroke.
- Severe burn.

PRACTICAL 10

Suggested Activities for Evaluation

Demonstration of following

1. Wound care.
2. Splints, slings, bandages.
3. Transportation of casualties.
4. BLS.
5. Naso gastric tube insertion.
6. Care during different emergencies.

CLASS–XII
ELECTIVE
CHILD HEALTH NURSING (731)

Learning Objectives

On completion of the course the student will be able to:

1. Describe school health programme.
2. Describe 'Right' of children.
3. Educate mothers and family member as per need of their children.

THEORY

Time: 2.5 Hours ***Marks: 50***

1. Children's Rights

- Convention of Rights of the Child.
- Prevention of child labour.
- Abuse and legal protection.
- Special care of girl child.
- Female infanticide.

2. Care of School Children

- School health: Objectives, problems and programmes.
- Environment of school.
- Assessment of general health of school children.
- Dental and eye problems.
- Nutritional deficiencies.
- School health education for children.

- Need based sharing of health information with teacher/ parents/ children.
- Records and reports.

3. Care of Adolescents

- Physical growth during adolescence.
- Emotional and behavioural changes in girls and boys.
- Special needs of adolescents.
- Sex education for adolescents.
- Counselling.

4. Care of Adolescent Girls

- Menstruation and menstrual hygiene.
- Special nutritional needs.
- Early marriage and its affects.
- Adolescent girls: Pregnancy and abortion.
- Preparing for family life- pre marital counseling.
- Role of ANM/ female health worker

PRACTICAL

Time: 2.5 Hours ***Marks: 50***

Suggested Activities for Evaluation

Case Studies

- Assessment of common adolescent illnesses in infant.
- Poster on.
  - Growth and development.
  - Prevention of common accidents in children.
  - Menstrual cycle.
  - Physical changes in adolescence.

CLASS–XII
ELECTIVE
MIDWIFERY (732)

Learning Objectives

On completion of the course the student will be able to

1. Describe male and female reproductive organs.
2. Explain process of conception and foetal development.
3. Describe female pelvis and the muscles involved in delivery of foetus.
4. Conduct normal delivery and provide care to the newborn.
5. Provide care to pregnant mother during ante, intra and post natal period at home and hospital.
6. Provide need based counselling to the mother and to her family during antenatal, intranasal and postnatal period.

7. Resuscitate the high risk new born baby.
8. Identify high-risk pregnancies and refer them immediately for safe mother- hood.
9. Identify deviation from normal labour in time and take necessary action.
10. Provide adequate care identifying abnormal puerperium.
11. Administer the drugs as per the protocols.
12. Educate community for improving quality of life of the family.
13. Promote improvement in the status of women in society.
14. Identify women's health problem and provide guidance and support.
15. Provide care and guidance to women with reproductive health problems.
16. Participate in reproductive health and family welfare programmes.

THEORY

Time: 2.5 Hours ***Marks: 50***

1. Human Reproductive System

- õ Female reproductive organs – structure and function.
- õ Menstrual cycle.
- õ Male reproductive organs structure and function.
- õ Process of conception.

2. Female Pelvis and Foetal Skull

- õ Structure of the pelvic bones-types of pelvis.
- õ Pelvic diameters.
- õ Muscles and ligaments of pelvic floor.
- õ Foetal skull: bones, diameters, sutures, size, shape, moulding, skull areas, fontanelles.

3. Foetus and Placenta

- õ Growth and development of foctus, foetal sac and amniotic fluid and foetal circulation and changes after birth.
- õ Structure and functions of Placenta, membranes and umbilical cord and abnormalities.
- õ Refer SBA module of Ministry of health and Family Welfare.

4. Normal Pregnancy

- õ Signs and symptoms of pregnancy.
- õ Various diagnostic test for confirmation of pregnancy.
- õ Physiological changes during pregnancy.
- õ Minot ailments during pregnancy and their management.
- õ Refer SBA module of Ministry of health and Family Welfare.

5. Antenatal Care

- õ Registration.
- õ Taking history of a pregnant woman.

- Physical examination, Investigation- routine and specific.
- Prophylactic medications.
- Needs based health information and guidance.
- Nutrition in pregnancy.
- Special needs of a pregnant woman.
- Involvement of husband and family.
- Identification of high risks cases and referral.
- Preparation of mother for delivery.
- Refer SBA module of Ministry of health and Family Welfare.

6. Normal Labour

- Onset and stages of labour, physiological changes.
- Changes in Uterine muscles, and cervix.
- Lie, attitude, position, denominator and presentation of foetus.
- Foetal skull.
- Mechanisms of labour.
- Identification of high risk cases.
- Foetal distress and maternal distress during labour.
- Pantograph in the management of the normal labour.
- Role of ANM/Female health worker and referral.
- Refer SBA module of Ministry of health and Family Welfare.

7. Care during Normal Labour

- History of labour.
- Importance of five 'C's.
- Monitoring progress of labour with partograph preparation of delivery.
- Care of mother in first and second stage of labour.
- Assist and conduct childbirth.
- Immediate care of new-born-resuscitation, apgar score, cord care.
- Oxytocin Misoprostol drugs: Dose, route, indication, contraindication, action, side effects, precautions, role and responsibilities of ANM/FHW.
- Delivery of placenta and examination of placenta.
- Care of mother in third and fourth stage: Recognise degrees of tear and appropriate care and referral.
- Establishment of breast feeding exclusive breastfeeding.
- Kangaroo mother care.
- Baby friendly hospital imitative.
- Record childbirth and ensure birth registration.
- Refer SBA module of Ministry of health and Family Welfare Care of mother-diet, rest, exercise, hygiene.
- Management of breast feeding.
- Prophylactic medicines.

- Special needs of postnatal women.
- Need based health education.
- Refer SBA module of Ministry of health and Family Welfare.

8. Care of New Born

- Assessment of new-born for gestation age, risk status and abnormalities.
- Neonatal resuscitation.
- Monitoring of vital signs and birth weight.
- Management of normal new-born and common minor disorders.
- Exclusive Breast feeding and management.
- Temperature maintenance, kangaroo mother care.
- Immunization.
- Care of newborn: Jaundice, infection, respiratory problems.
- Principles of prevention of infection.
- Educating mother to look after babies.
- Integrate accepted practices of AYUSH.
- Refer SBA module of Ministry of health and Family Welfare.

9. High Risk New Born

- Pre term/Low Birth Weight babies.
- Special needs of high risk babies.
- Care at home- referral and follow up.
- Care during asphyxia.
- Convulsion, vomiting.
- Care for thrush, cord sepsis, diarrhoea.
- Implementation IMNCI protocol.
- Refer SBA module of Ministry of health and Family Welfare.

10. Safe Motherhood

- Concept and cause of maternal mortality and morbidity.
- Safe motherhood components: RCH and NRHM.
- Preventive measures.
- Role of ANM/Female Health worker.
- Refer SBA module of Ministry of health and Family Welfare.

11. High Risk Pregnancies

- High risk pregnancies: Identification, Risk factors, decision making and management.
- Protocols and standing orders.
- Referral and follow up.
- Counselling and guidance about high risk conditions Involvement of husband and family.
- Role of ANM/Female Health worker.

- Refer SBA module of Ministry of health and Family Welfare.

12. Abnormalities of Pregnancy

- Common abnormalities of pregnancy: hyper emesis gravid arum, leaking and bleeding per vagina.
- Anaemia of pregnant woman.
- Eclampsia and pre eclampsia and toxaemia of pregnancy.
- Indication of premature rupture of membrances, prolonged labour, anything requiring manual intervention, UTI, puerperal sepsis.
- Obstetrical shocks.
- Uterine abnormalities, ectopic pregnancy.
- Diseases complication pregnancy – TB, diabetes.

13. Hypertension

- Infections during pregnancy – RTI/STIs malaria, HIV, AIDS.
- Rh factor.
- Standing orders and protocols.
- Role of ANM/Female Health worker.
- Role of ANM/Female Health worker.
- Refer SBA module of Ministry of health and Family Welfare.

14. Abortion

- Types of abortion, causes of abortion.
- Need for safe abortion – referral.
- Complications of abortions.
- Medical termination pregnancy.
- Care of woman who had abortion.
- Role of ANM/Health worker.
- Refer SBA module of Ministry of health and Family Welfare.

15. Abnormal Childbirth

- Common abnormalities of childbirth.
- Abnormal presentations.
- Abnormal uterine actions.
- Cephalo pelvic disproportion.
- Prolonged labour.
- Identification, immediate management and referral.
- Emergency care of mother during transfer to hospital.
- Role of ANM/Female health worker.
- Refer SBA module of Ministry of health and Family Welfare.

16. Abnormal Puerperium

- Postpartum haemorrhage and its management.

- Puerperal sepsis and its management.
- Retention of urine.
- Breast complications during lactation and their management.
- Refer SBA module of Ministry of health and Family Welfare.
- Psychiatric complications.
- Refer SBA module of Ministry of health and Family Welfare.

17. Surgical Intervention

- Assisting in the followings:
  - Induction of labour and its management.
  - Forceps and Vacuum extraction.
  - Episiotomy and suturing.
  - Craniotomy.
  - Caesarean section.
  - Pre and post operative care.
  - Role of ANM/Female health worker.
- Refer SBA module of Ministry of health and Family Welfare.

18. Medications used in Midwifery

- Pain relieving drugs.
- Anaesthetic drugs.
- For uterine contractions.
- For controlling bleeding.
- For preventing postnatal infection.
- For preventing eclampsia.
- Antibiotics.
- IV fluids.
- Role of ANM/Female health worker.
- Refer SBA module of Ministry of health and Family Welfare.

19. Life Cycle Approach

- Quality of life and life expectancy.
- People's health throughout the life cycle.
- Role of education economic status, social status on quality of life.
- Holistic approach to life.
- Refer SBA module of Ministry of health and Family Welfare.

20. Status of Women and Empowerment

- Status of women in society.
- Factors affecting status – gender bias, sex selection tests, female foeticide and infanticide sex ratio discrimination and exploitation.

- Effect of tradition, culture and literacy.
- Relationship between status of women and women's health.
- Effects of women's health in community : single, divorced deserted woman, widows special needs.
- Laws related to women. Programmes for women's empowerment.
- Refer SBA module of Ministry of health and Family Welfare.

21. Women's Health Problems

- Complications related to childbirth – VVF, RVF, prolapse and incontinence.
- Cervical erosion and leucorrhoea pruritus.
- Cancers – cervical and breast.
- Pap smear for detection of cancer cervix.
- Tumours – fibroids.
- Menstrual disorders.
- Menopause and its implications.
- Refer SBA module of Ministry of health and Family Welfare.

22. RTIs and STIs

- Causes and signs and symptoms of STIs and RTIs.
- Syndromic approach for treatment .
- Referral treatment and follow up care.
- Information, education and communication for prevention and treatment.

23. HIV/AIDS

- Epidemiological facts related to spread of infection.
- Methods of transmission.
- Effect on immunity and signs and symptoms.
- The AIDS patient community support and home care.
- Counselling: process and techniques.
- Counselling of HIV/positive patients and pregnant women.
- Standard safety measures.
- Voluntary counselling and testing center (VCTC)/Integrated counselling and testing center (ICTC) activities.
- Care continuum and Anti Retro viral Therapy (ART).
- Prevention of parent to child transmission (PPTCT): prophylaxis and breast feeding guidelines.

24. Infertility

- Classification and Causes of infertility in male and female.
- Investigation and treatment.
- Identification of couples, counselling, referral and follow up.
- Role of ANM/Female health worker.

25. Population Education

- Population trends in India.
- Vital statistics birth and death rates, growth rate, NRR, fertility rate, couple protection rate, family size.
- National family Programme trends and changes RCH-I, RCH-II programme and NRHM.
- Target free approach for FW.
- Role of mass media and IEC.
- Role of ANM/health worker.

26. Family Welfare

- Identification of eligible couples and those need contraceptive methods.
- Information related to contraception and importance of choice.
- Natural and temporary methods of contraception.
- Permanent methods.
- New methods nor-plant and injectables.
- Emergency contraception.
- Follow up of contraceptive users.
- Counselling.
- Role of ANM/female Health worker.

PRACTICAL

Time: 2.5 Hours ***Marks: 50***

Suggested Activities for Evaluation

- Taking of history and antenatal examination.
- Demonstration of vaginal examination.
- Plotting of partograph during labour.
- Return demonstration of normal delivery using five 'C's.
- Demonstration of perineal care.
- Essential Care of newborn.
- Apgar score and resuscitation of a new born baby.
- Health education on exclusive breast-feeding.
- Midwifery case book.
- Demonstration of immunization.
- Drug book.
- Records and reports.
- Case studies.
- Preparation of posters on methods of Family welfare.
- Demonstration of IUCD insertion.
- Information Education and Communication.
- Calculation for vital indicators.

CLASS–XII
ELECTIVE
HEALTH CENTER MANAGEMENT (733)

Learning Objectives

On completion of the course the student will be able to

1. Organise sub center and clinics to carry out scheduled activities.
2. Indent and maintain necessary stock.
3. Participate in the implementation of National health programmes.
4. Update knowledge and skills.
5. Provide guidance to TBA, AWW, ASHA and other voluntary health workers.
6. Collaborate and coordinate with other health team members and agencies.
7. Maintain records and reports.

THEORY

Time: 2.5 Hours ***Marks: 50***

1. The Sub Center

- Organization of functions and facilities of sub centre.
- Sub centre activity plans.
- Conduct a clinic and special programs and follow up.
- Conducting meetings and counselling sessions.
- Sub centre action plan.
- Information, education and communication.
- Display of messages.

2. Maintenance of Stocks

- Maintenance of supplies, drugs, equipment, stock, indenting.
- Calculation of indent as per population requirement.
- Management information and evaluation system (MIES).
  - Maintenance of records.
- Reports of sub centre.

3. Co-ordination

- Inter-sectoral co-ordination.
- Co-ordination with school teachers, ASHA, anganwadi workers, panchayat.
- Role of NGOs and co-ordination with government departments.

4. The Sub Centre

- Organization of functions and facilities of sub centre.
- Sub centre activity plans.
- Conduct a clinic and special programs and follow up.

- Conducting meetings and counselling sessions.
- Sub centre action plan.
- Information, education and communication.
- Display of messages.

5. Maintenance of Stocks

- Maintenance of supplies, drugs, equipment, stock, indenting.
- Calculation of indent as per population requirement.
- Management information and evaluation system (MIES).
  - Maintenance of records.
- Reports of sub centre.

6. Co-ordination

- Inter-sectoral co-ordination.
- Co-ordination with school teachers, ASHA, anganwadi workers, panchayat.
- Role of NGOs and co-ordination with government departments.

7. Implementation of National Health Program

- National Health programs and the role of the ANM.
- Detection, referral, treatment and follow up of cases of malaria, leprosy tuberculosis, blindness, goiter.

8. Update Knowledge

- Continuing education for self development – circulars, handouts, meetings, journals.
- Methods of self development.
- Interacting with community.
- Improving writing speaking abilities in local language and English.

PRACTICAL

Time: 2.5 Hours ***Marks: 50***

Suggested Activities for Evaluation

- Detection of tuberculosis, malaria, leprosy etc.
- Assignment on records and reports maintained at sub centre.
- Peer group teaching on DOTS & MDT.
- Participation of national health programmes at CHC/PHC/SC.
- Assignment on organization of sub-centre/clinics.

LIST OF RECOMMENDED BOOKS

Anatomy & Physiology

1. Ferris, E.B. and Skelley, E.G. Body Structure & Functions.
2. Albany Roper, Nancy, **Man's Anatomy, Physiology, Health & Environment,** Delmar Publishers, New York.

3. Taylor Nerman & Nepheadran, Margaret **G. Basic Anatomy & Physiology,** Churchil & Livingstone, Edinburgh.
4. Pearle, Evelyn, **Anatomy & Physiology for Nurses,** Faber Ltd.
5. Memmler, R.L. & Lada, R.B. **The Human Body in Health & Diseases,** G.B. Lippincott, Philadelphia.
6. Marshal, Stanely, **Elementary Bacteriology and Immunity.**
7. Catherine Armstong, **Anatomy & Physiology for Nurses** Second Hindi Edition 1984, Published by N. R. Brother, Sanyogita Ganj, Indore, (M.P.)
8. Gatherine F. Arnstrong, **Aids to Anatomy & Physiology for Nurses** Sixth Edition, Bailliere, Tandull & Cox T. 8 Lenrietta street book society.

Microbiology

1. Marshal, Stanely, **Elementary Bacteriology & Immunity for Nurses,** London, Lewis Publishers.
2. Ferxis Elvira B. **Micro–biology for the Nurse,** Delmar Publishers, New York.
3. Margret J. Parker, **Micro–biology for Nurse**, (Hindi Edition).
4. Simplified **Micro–biology** published by T.N.A.I.

Hygiene

1. Priest, N. A. **Modern Text Book of Personal & Communal Health for Nurses,** London, E.L. & B.S. William Hernemann Medical Books.
2. Yaspal Bedi, **Hygiene.**

Psychology

1. Nilliken, Mary Elizabeth, **Understanding Human Behaviour,** A Guide–for Health Workers, Delmar Publisher, New York.
2. Bhatia B.D. & Craig N, **Elements of Psychology & Mental Hygiene** Orient Longman & Cox, New Delhi.
3. Dr. Ramnath Sharma, **Psychology & Mental Health for Nurses,** N.R. Bros., Sanyogita Ganj, Indore, (M.P.).

Sociology

1. Gagan Hinduja, **Sociology for Nurses,** N. R. Bros., Sanyogita Ganj, Indore (M.P.).

Nutrition

1. Swaminathan, N. & Bhagwan, **R. K. One Food**, Ganesh & Co., Madras.
2. I.C.M.R. **The Nutritive Value of Indian Foods & the Planning of Satisfactory Diets.**
3. C. Gopalan, B.V. Rama Shastri, S.c. Balasubramanian, **Nutritive Value of Indian Foods**, Indian Council Of Medical Research, P.O. Box. 4508, Ansari Nagar, New Delhi.
4. Maurice H. King, **Nutrition for Developing Countries,** English Language Book Society & Oxford University Press.

Fundamentals of Nursing

1. **Manual for Health Worker (Female)** Ministry of Health & Family Planning – W.H.O. Project HMD-006 Published Vol. I & Vol. II.
2. **Manual for Health Worker (Male)** Vol. I & II Ministry of Health & Family Planning, WHO Project HMD–006.
3. SEARA – Gandhigram Institute of Rural Health & Family Planning, **A Guide for First Aid Treat tents of Minor Ailments for Auxiliary Nurse Midwives**, Madurai, Tamilnadu (Minco graphed Manual).
4. Hornenann, Grute V. **Basic Nursing Procedures,** New York, Delmar Publisher.

5. Lilli Pritam Teluram, **Manual of Nursing Arts Procedures**, Printed at New Print India Pvt. Ltd., Sahibabad. (U.P.).
6. A.H. Chalklay, **A Text Book for the Health Workers (ANM), Volume I & II,** Revised according to New Syllabus, 1987, Wiley Eastern Limited, Ansari Road, Daryaganj, New Delhi.
7. **Where There is No Doctor,** Voluntary Health Association of India. (Hindi).

Maternal & Child Health, Family Planning & Welfare

1. Cox, **H. Midwifery Manual** – A Guide for Auxiliary Midwives, McGraw – Hill for Eastern Publishers.
2. Bleier I.J. **Maternity Nursing** – A Text Book for Practical Nurses, W.B. Saunders, Philadelphia.
3. **W.H.O. Notes for the Practising Midwife,** New Delhi.
4. Laxmanswami Mudaliar, **Case Book for Midwives,** Caxton Press, Madras.
5. Berkeley **A Handbook of Midwifery for Nurses,** London, J & A Churchill.
6. Margret F. Myles. **A Text Book for Midwives,** Hindi Edition, N. R. Brothers, Sanyogita Ganj. Indore.
7. Ela Anad (Dr.) **Everything a Woman needs to know about Pregnancy,** First Edition, 1975, Vikas Publishing House Pvt. Ltd., 5 Daryaganj, Ansari Road, Delhi.
8. Joyce, McNiven, **Aids. to Obstetrics & Gynaecology Nursing,** 7th Edition, Bailliere,Yindall & Cox, 1 & 8 Henreitta Street, W.C. 21.9.6.4.
9. Margret G. Mcphedian, **The Maternity Cycle, A Physiological Approach to Nursing Carge., 1961.** The Macmillan Co. of Canada Limited, Toronto.
10. Helen Cox., Midwifery Manual, **A Guide for Auxiliary Midwives McGraw** – Hill, International Book Division, Singapore.
11. Bowlby, **Maternal Care & Mental Health**, W.H.O. Mimeograph series, W.H.O. Palais Des Nations, Geneva, 1952.
12. Ruth Young, **Hand Book on Prenatal Care for Nurses, Midwives & Health Visitors,** 3rd Edition, 1988, Issues by Maternity & Child Welfare Bureau, Indian Red Cross Society.
13. **Notes for the Practising Midwife,** Directorate General of Health Services, Ministry of Health & Family Welfare, Govt. of India, Nirman Bhavan, New Delhi.
14. **Daiyon Ki Pustika,** Swasthya Sewa Mahanideshlya, Swasthya Aur Parivar Kalyan Mantralaya, New Delhi.
15. Robert Martin, **Parshav Karm Sambandhi Roop Rekha,** Shukla Book Depot, Aminiabad, Lucknow.

Child Health

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LIST OF TEACHING EQUIPMENTS, CHARTS, MODELS, GLASSWARE ETC.

A. Bones

1. Full size human skeleton on stand.
2. Loose bones: Skull, Cranial Bones – Frontal, Parietal, Temporal Occiptal, Ethoid, Sphenoid, Nasal Bones.

   Maxilliae & Mandible Vertebrae: Cervical, Thoracic, Lumbar, Sacral, Coccyx, Sternun, Ribs.

   Thorax: Shoulder Girdle & Upper Extremit – Scapula, Clavicle, Humerus, Radius Ulna, Carpus, Matacarpus, Phalanges, Bones of Pelvis and Lower Extremity – Innoniate bone, Fenur, Tibia, Fibula, Patella, Tarsus, Metatarsus, Phalanges, Pelvis Male & Female.

B. Charts on Human Anatomy

1. Cell and Tissue.
2. Skeletal system.
3. Muscular system.
4. Circulatory system.

   (including lumph glands and their vessels).
5. Digestive system.
6. Respiratory system.

7. Endocrine system.
8. Excretory system.
9. Reproductive system – Male and Female.
10. Nervous system.
11. Organs of special senses: Eye, Ear, Nose, Skin.
12. Human Atlas.

Loose Charts

13. Heart .
14. Superficial veins and blood vessels.
15. Development & functions of blood.
16. Diseases of blood cells.
17. Lymphatic system.
18. Circulation.

Skeletal System

19. Skeleton.
20. Disjointed elbow.
21. Fractures.
22. Birth Atlas.

Endocrine System

23. The Adrenals.
24. The Pituitary and Pancreas.
25. The Thyroid & Parathyroid.
26. The Gondas.
27. The Endocrine glands.

The Injured and Sick

28. Tripod stand.

C. Models

I. Full size Human Body Showing

1. Muscles.
2. Cavities of the body with organs (Torso).
3. Circulatory system.
4. Lymphatic system.
5. Digestive system.
6. Urinary system.
7. Reproductive system.
   Female internal genital organs.
   Female external genital organs.
   Male genital organs.

8. Heart with main blood vessels.
9. Lungs.
10. Larynx.
11. Trachea, bronchi .
12. Digestive organs–Stomach, Liver, Pancreas.
13. Brain.
14. Spinal cord with Derves.
15. Eye.
16. Ear.

II. **Loose Models**

17. Skin.
18. Eye.
19. Ear
20. Larynx.
21. Brain.
22. Heart.
23. Cross Section of brain.
24. Medium Section of pelvis.
25. Female reproductive system.
26. Foetus Showing different stages of growth.
27. Foetus and pelvis.
28. Dummy with foetus.

D. Microscope with Low Power High Power & Oil (Immersion Lens)

E. Haemoglobinometer with Pipette–18 Haemocyt Meter.

F. Sphygmomanometer–1

G. Stethoscope–1

H. Projected Aids

1. Overhead projector.
2. Epidiascope.
3. Film strip and slide projector 2 x 2.
4. 8 mm Film projector.
5. Tape Recorder.
6. V.C.R. and Television.
7. 16 mm Film projector sound.
8. Dicroscopic slides on different systems.
9. Slides 2 x 2 cm different systems and subjects.
10. Transparencies – on different systems and Family Planning.
11. Cassettes – (for 8 mm film projector) on different systems and on birth process.

REQUIREMENTS FOR NURSING ARTS & MIDWIFERY EQUIPMENTS

(For 20 students)

A. Enamelware

1.	Trays:	24" x 16"	– 6
		14" x 10"	– 6
		11" x 9"	– 6
2.	Trays with cover.		
		11" x 5"	6
3.	Bowls:	16" diameter.	– 6
		19" diameter.	– 6
		6" diameter.	– 6
		3" diameter.	– 6
4.	Bowls with cover:		
		6" diameter.	– 6
		3" diameter.	– 6
5.	Buckets with cover:		– 4
6.	Enema Can: 2 pint.		4
		1 pint.	
7.	Kidney Trays:		
		12" – 10" length.	– 6
		8" – 6" length.	– 6
8.	Galipets n as available.		
9.	Jugs		
	8 pint	4000	
	4 pint	2000	2 each
	2 pint	1000	
10.	Measuring Jugs.		
	1000 ml/2 pint capacity.		
	500 ml/1½ pint capacity.		2 each
	250 ml/1½ pint capacity.		
11.	Douche Cans.		
	1000 ml/2 pint capacity.		– 2
	500 ml/1 pint capacity.		– 2
12.	Catheter Dish with cover.		
	20" x 4"		– 4
13.	Knife Dish.		
	9" x 4"		– 4
14.	Feeding Cups.		
	250 ml/10 oz capacity.		– 3

180 ml/6 ox capacity. – 3

15. Sputum Mugs.

250 ml/10 oz capacity. – 6

16. Bed–Pan.

Perfection type. – 4

Children's.
– 2

17. Urinal.

Male. – 1

Female. – 1

18. Funnel.

Big. – 4"

Small. – 3"

19. Soap Dish.
– 6

20. Sitz bath tub. – 2

21. Baby bath tub. – 2

26" x 8" x $2\frac{3}{7}$

22. Jars with cover 17" x 7" – 2

6" x 6" – 4

4" x 4" – 4

23. Dressing Trolley.

24. Container of various sizes. – 12

25. Auto Clave.

26. Sterlizer.

B. Glassware

1. Measure Glass.

8 oz/240 ml. – 2

6 oz/180 ml. – 2

4 oz/120 ml. – 2

2 oz/60ml. – 4

1 oz/30ml. – 6

Drachm 14 ml. – 4

Minimum Measures 10 ml. – 4

2. Undine – 6" – 2

– 4" – 2

3. Eye bath. – 4

4. Douche Nozzle. – 4

5. Glass rods.
– 2

6. Pipette. – 6
7. Dropper. – 6
8. Glass connections.
9. Straight. – 12
   Y – 12
   T – 12
   L – 12
10. Drip. – 12
    Drip with strainer. – 12
11. Feeding bottles of various types hygiea auto or Free flow Boat. – 4
12. Breast pump. – 2
13. Nipple shield. – 2
14. Wolf's bottle. – 2
15. Thermometer.
    Lotion. – 1
    Bath. – 1
    Oral. – 12
    Rectal. – 6
16. Barometer. – 2
17. Pulsemeter/Stop watch. – 2
18. Lactometer. – 2
19. Urinometer. – 2
20. Manometer. – 2
21. Conical Flasks. – 2
22. Specimen glass. – 4
23. Flat bottom Flasks. – 4
24. Test tubes – 4 dozen.
25. Glass Slides. – 1"
26. Syringes.
    a) Disposable syringes of all sizes.
       50 c.c. – 1
       30 c.c. – 2
       20 c.c. – 1
       10 c.c. – 1
       5 c.c. – 1
       2 c.c. – 1
    b) All Glass.
       50 c.c. – 2
       30 c.c. – 2
       20 c.c. – 2

10 c.c. – 2

5 c.c. – 2

2 c.c. – 6

c) Tuberculin syringe. – 2

d) Insulin syringe. – 2

e) 50 c.c. – 1

30 c.c. – 1

20 c.c. – 1

10 c.c. – 2

5 c.c. – 2

2 c.c. – 1

27. Drainage bottle. – 4

28. Atomizer. – 1

29. Spirit lamp. – 4

C. Rubber Goods

1. Mackintosh.

– Bed length. – 2

– Draw mackintosh with cloth on two sides 1 m. – 4

– Enema mackintosh 1 m. – 2

– Narrow draw mackintosh with cloth on two sides – ½. – 2

– Dressing – ½. – 4

– For treatment – ½. – 4

2. Rubber or plastic apron. – 2

3. Kelly's pad – 2.

4. Cathetors Nasal. – 2

– Urethral. – 2

– Depezzer's. – 2

– Malicot. – 2

– Folley's. – 2

– Rectal. – 2

5. Ryles Tube. – 2

6. Levin's Tube. – 2

7. Rehrus Tube. – 1

8. Miller Abbot Tube. – 1

9. Flatus Tube. – 2

10. Rectal Tube. – 2

11. Stomach Tube. – 2

12. Blackmore sengstaken's Tube. – 1

13. B.L.B. Masks. – 1

14. Tourniquet. – 2
15. Ice Caps. – 2
16. Hot Water Bottle. – 4
17. Ai Cushion. – 2
18. Gloves.

    –5½" –6" –6½"

    –7" –7½" (2 Prs. each)
19. Finger stalls. – 4
20. Finger costs. – 4
21. Teats .

    – 6

    Valve. – 6
22. Endotra Cheal Tube.

    Cuffe and Plain. – 1 each
23. Air way tube. – 2
24. Latex rubber tubing. – yds.
25. Corrugated rubber sheet. – 2
26. Mocous extractor. – 2
27. Family planning kit.
28. First Aid Kit and Strecher.

D. Instruments

1. Cheatles's Forceps. – 2
2. Sponge Holding Forceps. – 2
3. Towel Clips. – 2
4. B.P. Handle Nos. 3, 4 and 5. – 1 each
5. B.P. Handle Blades No. 10, No. 11, No. 15 No. 21 No. 23.
6. Mayo's Scissors.
   - Curved. – 2 Pr.
   - Straight. – 2 Pr.
7. Dressing Scissors. – 2 Pr.
8. Bandage Scissors. – 2 Pr.
9. Nail cutting Scissors. – 2 Pr.
10. Dissecting Focepts:
    - Toothed. – 2 Pr.
    - Non-Toothed. – 2 Pr.
11. Artery Forceps:
    - Straight. – 4
    - Curved. – 4
    - Mosquito. – 2
    - Kocher's. – 4

– Spencerwelle. – 4

12. Tissue Forceps:
    – Lanes. – 2
    – Allis. – 2
    – Lehey's. – 2
13. Sinus Forceps. – 2
14. Scalpel. – 2
15. Dressing Forceps:
    – Aural . – 2
    – Ordinary. – 2
16. Nasual Speculum. – 2
17. Probe & Director. – 2
18. Greave Director with probe. – 2
19. Dissector. – 2
20. Aneurysm Needle. – 2
21. Tongue Spatula. – 2
22. Tongue Forceps. – 2
23. Mouth gag . – 2
24. Retractors different types. – 2
25. Single hooked retractor. – 2
26. Double hooked retractor. – 2
27. Tracheotomy tube 2 size. – 2
28. Trachaeal dilater. – 2
29. Speculum:
    – Aural. – 2
    – Nasal. – 2
    – Vaginal Bl-valve. – 2
    – Rectal. – 2
30. Metal Catheter . Male 2
    Female – 2
31. Metal sound:
    – Bladder. – 2
    – Uterine. – 2
32. Male Urthral dilaters. – 1 set
33. Female cervical dialtors. – 1 set
34. Sims speculum.
35. Arteries Vaginal wall retractor.
36. Ovum Forceps.

37. Blunt and sharp curetta.
38. Flushing currette.
39. Michel Clips holder. – 1
40. Michel Clips remover. – 1
41. Michel Clips. – 2 set
42. Trecar and Canula. – 2
43. Sternal puncture needle. – 2
44. Canula. – 2
45. Needles (Suture).
    Straight cutting. – 2
    Curved cutting. – 2
    Curved round bodied. – 2
    Maya's. – 2
    Galliec's. – 2
46. Injection needles:
    Hypodermoclysis. – 6
    I.M. – 6
    I.V. – 6
    Subcutaneous. – 6
    L.P. – 2
    A.P. – 2
    Liver Biopsy needle. – 2
    Cisternal. – 2
    Theracontsis. – 2
    Aspiration. – 2
47. Adaptor. – 4
48. Connections. – 2 way
49. Safety Razors with Blades. – 2
50. Drecs Smith Catheter. – 1
51. Bozemann's Catheter. – 1
52. Needle holders. – 2
53. Pelvimeter. – 1
54. Foetoscope. – 2
55. Suction apparatus (if available). – 1

E. Disposable Sets

1. I.V.
2. Blood Transfusion.
3. Hyodermo clysis.
4. Prectocylsis.
5. Disposable Napkins.

6. Disposable Caps.
7. Disposable Masks.
8. Disposable Tubes.
9. Disposable Catheters.
10. Disposable tubing for C.V.P. line.

F. Linen

1.	Mattress.	
	(adult, crib and child cot).	– 6
2.	Mattress Protector.	– 2
3.	Mattress covers.	6
4.	Bed sheets. – 30	
5.	Draw sheets.	– 30
6.	Pillows.	– 12
7.	Pillow slips.	– 30
8.	Sand bags (of various sizes).	– 6
9.	Sand bag covers.	– 6
10.	Blankets.	– 6
11.	Counterpanes.	– 8
12.	Towels.	
	Treatment, Bath and Hand.	– 30
13.	Sponge cloth.	– 30
14.	Medicine cloth.	– 6
15.	Dusters.	– 6
16.	Bedpan cover.	– 6
17.	H.W.B. covers.	– 6
18.	Ice ca P covers.	– 6
19.	Air ring covers.	– 6
20.	Gowns.	– 6
21.	Masks.	– 12
22.	Patients' clothes:	
	Jackets.	4
	Skirts.	– 4
23.	Restraints.	– 4 sets
24.	Gloves Bags.	6
25.	Trolley covers.	– 2
26.	Trolley bags.	– 2
27.	Rings.	– 6 dozs.
28.	Screens.	– 6
29.	Canvas bag (for dirty linen).	– 2

30. Table cloth. – 6
31. Baby blankets. – 6
32. Baby clothes & Drod binders. – 6 sets
33. Baby sheets. – 12
34. Baby mattress. – 2
35. Leggings. – 2
36. Perineal sheets/Guard. – 2
37. Paticuts' Gowns. – 2
38. Bandages and binders. – 2 each
39. Triangular bandage. – 20

G. Furniture

I. **For Each Class Room.** **Lecture stand tube light according to no. of students.**

1. Chairs with one arm broadened for writing purpose and shelf for keeping books.
2. Table for lectures. – 1
3. Chair for lectures. – 2
4. Black Board (Green glass) 4' x 3' preferably fixed on the wall. – 2
5. Black Board Stands (where board cannot be fixed). – 2
6. Graph Board.
7. Projector Table/Trolley.
8. White and coloured chalks.
9. Skeleton stand. – 1
10. Easel stand. – 1 each class
11. Glass Notice Board. 1 each class
12. Bulleting Board. – 1 each class
13. Wall Clock. – 1 each class
14. Glass Cases for poster with khadi or felt lining. – 1 each class
15. Spare table. – 1
16. Waste paper basket. – 1 each room
17. Pointer. – 1
18. Ink stand with ink wells with pen holders. – 1 each teacher
19. Hand washing equipments.
20. Paper weights. – 2 each teacher
21. Paper clips common pins. – 1 each teacher
22. Punching machine. – 1 each teacher
23. Stapler with staples. – 1 each teacher
24. Table glass. – 1 each teacher
25. Photographs concerning Medical profession:
    - Louis Pasteur.
    - Robert Koch.

– Lister.

– Florence Nightingale.

II. For Demonstration Room

1. Bed stead's (4 for 20 students) Gatch Bed – 1

   (6 for 21–40 students) Fracture bed – 1

   Spring bed with fitted trays & rings for gamlas. –2
2. Bedside lockers. – According to No. of beds.
3. Chairs. – According to No. of beds.
4. Cardiac Table. – 2
5. Diet Table. – 2
6. Foot Block (different sizes). – 2 prs.
7. Cradles ordinary. – 2
8. Back rest. – 2
9. Dirty lien bin. – 2
10. Wheel chair. – 2
11. Stretcher trolley for transportation of patients. – 1
12. Irrigating stands. – 2
13. Dressing trolley. – 2
14. Lock tables for keeping trays. – 2
15. Baby bath table. – 2
16. Baby cribs. – 1
17. Chair. – 2
18. Child cot. – 1
19. Black Board stand. – 1
20. Black Board. – 1
21. Duster.
22. Chalks.
23. Pointer.
24. Bowl stand. – 4
25. Screen Frame. – 2
26. Baby weighing scale. – 2
27. Infanto meter. – 2
28. Steel cupboards. – 6
29. Instruments cabinents. – 2
30. Show case for anatomy models. – 1
31. Filling cabinet. – 2
32. Long mirror. – 1
33. Foot Board. – 1

34.	Plaster board.	– 1
35.	Patra (Piri).	– 2
36.	Adult weighing scale.	– 1
37.	Hand washing equipment with stand.	– 1

For Home Delivery Equipment

1.	Midwifery kit.	– 2
2.	Earthern ware mudpots.	Large 2, Medium 3
3.	Small with lid.	– 2
4.	Earthen ware gumla.	– 2
5.	Mud Pitcher.	– 2
6.	Aluminium Degchi with lid.	– 2
7.	Earthenware gumla.	– 2
8.	Chula.	– 2
9.	Hat.	– 2
10.	Gunny bag.	– 2
11.	Patra (Piri).	– 4
12.	Aluminium bag.	– 2
13.	Postratal bags.	– 6
14.	Home visiting bags.	– 10
15.	Charpay.	– 2

X–RAY TECHNICIAN

Preamble

Medical Science has made tremendous advances in last two decades. The new diagnostic methods like, Ultrasound. C.T., NMR etc., have revolutionised the medical practice to arrive at correct and accurate diagnosis. WHO have already envisaged One X-ray unit to be attached to every primary health centre thus creating the need for trained para medical personnel in X-ray technology. On the horizon of cancer treatment, radiotherapy plays a crucial role. All modern cancer treatment centres are equipped with radiotherapy units which have an essential requirement of trained para-medical personnel in radiotherapy.

The vocational course of X-ray technician aims at meeting the demand for trained para medical petsonnel in the field of radiology/radiotherapy. The trained personnel will help in providing better radiological services leading to optimum utilization of the available resources.

Employment Potential

Wage Employments

- Radiographer Dark Room.
- Technician Radiotherapy.
- Technician.

Employing Agencies

- Medical College/Hospitals.
- Central and State Govt. hospital.
- Primary Health Centres Polyclinics and Nursing Homes.
- Private Hospitals.
- Private Clinics.
- Veterinary Hospitals and Colleges.
- Industrial Establishment e.g. Naval Dockyard.
- Armed Force Medical Services.
- Scientific and Research Institutions.
- Teaching Colleges/Hospitals of other Systems of Medicine (e.g. Homeopathy).

Sources of Technical Assistance

Technical

- Medical Colleges/Research Institutions.
- Manufacturers/Suppliers of X-ray Equipment.

Financial

- Nationalized Banks.

The Course offers Knowledge on

- Basic Principles and components of electrical circuits, X-ray equipment and its accessories.
- Basic knowledge of processing of films etc.
- Radiological anatomy and physiology of human body, Radiographic techniques and various positions for different parts of human body, Basic knowledge of X-ray tube, Basic concept of special investigative procedures like, Barium, IVP, Hysterosalpingo-graphy, Ultrasound, CT, etc.

Important Notes

- For eligibility, scheme of studies, scheme of examination and for other relevant information, rules and regulations, please refer to senior school curriculum for the relevant year of examination.
- The students of X-Ray Technician course will undergo on-the-job training for a period of 8 weeks preferably at the end of class Xl summer vacations, autumn and winter break in class XII.
- A certificate should be issued jointly by the Principal and Course Director concerned as per the format given at the end of the syllabus.
- The candidates after passing the X-Ray Technician vocational course should undergo a satisfactory practical training of one year in Govt. recognised hospital/nursing home.
- As per the guidelines laid down by the Atomic Energy Commission Regulatory Act no person less, then 18 years age is allowed to work as Radiation Worker.

CLASS–XI
ELECTIVE
ANATOMY, PHYSIOLOGY & RELATED PATHOLOGY (667)
THEORY

Time: 2 Hours ***Marks: 30***

I. (a) **Introduction** **10**

(i) Introduction to Radiology & Radiological Services.

(ii) Structure of the body–cells, tissues.

(b) **Musculo Skeletal System:** Skull, Vertebral column, Shoulder Girdle Bones of upper extremities, Bones of lower extremities, pelvis and its muscles, Ossification.

(c) **Cardiovascular System:** Heart–blood–Arteries–Veins.

(d) **Lymphatic System:** Circulation of Lymph, Lymph glands, Thoracic duct.

II. (a) **Digestive System:** Mouth–oesophagus–stomach–small intestines large intestines spleen Liver Gall bladder Pancreas. **10**

(b) **Respiratory System:** Nose, Larynx-Trachea-Lungs Bony-case.

(c) **Nervous System:** Brain-meninges-ventricles-Spinal cord and nerves.

(d) **Eye:** Structure and its function.

(e) **Ear:** Structure and function.

(f) **Surface Anatomy and Cross–sectional Anatomy.**

III. (a) **Reproductive System:** Female & Male organs. **10**

(b) **Urinary System:** Kidneys, Ureters, Bladder, Prostate and Urethera.

(c) **Skin:** Structure and its function.

(d) **Endocrine System:** Pituitary gland, Penial gland, Thymus gland, thyroid and parathyroid gland, suprarenal glands.

PRACTICAL

Time: 3 Hours ***Marks: 70***

1. Identification of the various parts & structure in human body on charts & models. **12**

2. Identification of bones of skeleton. **12**
3. Surface marking of human body. **12**
4. Identification of Bones & parts on X–ray films. **12**
5. Visit to Pathology museum for identification of Common Pathology lesions. **12**
6. Visit to Anatomy museum for identification of various parts of the human body. **10**

CLASS–XI
ELECTIVE
DARK ROOM TECHNIQUES (668)
THEORY

Time: 2 Hours ***Marks: 30***

I.
- **Photographic Process:** Light image, Image produced by radiation, Light Sensitive materials, latent image. **10**
- **Film Material:** The structure of X–ray & Imaging films, Resolving power, Grains of films, sensitivity of film, contrast of films, Type of films.
- **X–ray Film Storage:** Storage of unexposed films.

II.
- **Screens:** Construction of intensifying screens. **10**
  - Choice of fluorescent material.
  - Intensification factor, Detail, Sharpness.
  - Sped, Screen contact, care of intensifying screens, Types of Screens.
- **Cassettes:** Cassette designs, Care of cassette, Mounting of intensifying screen in the cassettes, Various types of cassettes.
- **Safe Light:** Constituents, filter, testing.

III.
- **Film Processing:** Constituents of processing solution and replenishes. **10**

  Factors affecting the development.

  Types of developer and fixer, Factors affecting the use of fixer. Silver recovery methods.
- **Film Rising, Washing and Drying:** Intermediate rinse–washing and drying.
- **Film Processing Equipment:** Manual and Automatic processing.
- **Dark Room Design:** Outlay and materials used.
- **Radiographic Image:** The sharpness, contrast, detail, definition, viewing conditions & artefacts.
- **Miscellaneous:** Trimming, identification of films, legends, records filing, report distribution.

PRACTICAL

Time: 3 Hours ***Marks: 70***

1. Testing of dark room light for safety. **3**
2. Testing of intensifying screen for uniform contact. **3**
3. Preparation of the developer and fixer. **6**
4. Loading and unloading of X–ray films. **6**
5. Processing of X–ray films. **6**

6.	Manual film processor care.	**6**
7.	Automatic film processor care.	**6**
8.	Handling of exposed and unexposed films.	**4**
9.	Prevention of artefacts.	**10**
10.	Storage & care of hangers.	**10**
11.	Care of intensifying screen & cassettes.	**10**

CLASS–XI
OPTIONAL
GENERAL PHYSICS (666)
THEORY

Time: 2 Hours ***Marks: 30***

I.
- Elementary idea of thermionic emission, Electrone–idea of mass and nature of charge, Coulomb's law, Electric field, Unit of potential. **10**
- Ohm's law, Units of resistance, potential and current, Combination of resistance in series and parallel.
- Fuses, Units of electric power, Earthing of electrical equipment.

II.
- Magnetic fields, Lines of force, Field pattern due to a straight current carrying conductor, coil carrying current, electromagnet, Construction and working of galvanometer, voltammeter and ammeter, (moving coil type and moving magnet type). **10**
- Heat and methods of transference of heat, condensers, Inductance and Impedance.
- A.C. and D.C. currents-effective current, RMS value, peak value.
- Electromagnetic induction – Laws, fields, influence.

III.
- Transformers – Principles, construction, and uses of step down and High tension transformers. **10**
- Diode values and their use in rectifiers solid-state rectifiers, its various rectifying circuits uses in X–ray machines, production of X–rays and their properties, X–ray tube–Stationary anode and rotating anode & therapy tubes, X–ray circuit, interlocking circuits, relay and timers.

PRACTICAL

Time: 3 Hours ***Marks: 70***

1.	Verification of Ohm's law.	**5**
2.	Verify the rules of series and parallels combination of resistance.	**5**
3.	Study the potential drop across different resistances.	**10**
4.	Determine the field along the axis of a coil carrying current.	**10**
5.	Study the characteristic curve of a diode valve.	**10**
6.	Study the impedance of a coil in A.C. and D.C.	**10**
7.	To find out the transformation ratio of a transformer.	**10**
8.	To construct a rectifying circuit with the help of (a) Diode valve (b) Transistor.	**10**

CLASS–XII
ELECTIVE
RADIOGRAPHY–I (GENERAL) (667)

THEORY

Time: 2 Hours *Marks: 30*

I. Radiography Preparation 15

Study and operation of X–ray machine.

(a) Checking phase and voltage, MAS and KV metre, X–ray table, Control panel.

(b) Checking of level of chemicals in dark room, temperature of solution, maintenance and care of X–ray machine, accessories and darkroom equipment and safe light.

(c) X–ray requisition form to be checked and register for radiography.

(d) Proper factors (K.V. & M.A.S.) to be selected, Appropriate Film Selection.

Assistance in fluoroscopy and other special investigative and imaging procedure.

II. Radiography Techniques 15

A. (i) Upper Limb: Fingers individual and as a whole hands, Carpal bones wrists, Forearm, elbow–head of radius, humerus, shoulder joint, Acromio clavicular joint, scapula, sterno clavicular joint, small joints.

(ii) Lower Limb: Toes, foot, calcaneum & other trarsal bones, ankle joint, legs, knees, patella, fibula, femur, intercondylar notch.

(iii) Hip & Pelvis: Hip, Neck of femur, threatre procedure, for hip pinning or reduction, pelvis, sacro iliac joints, pubic bones, acetabulum.

B. (i) Vertebral Column: Curves, postures, relative levels atlanto, occipital region, odontord process, Cervical spine, thoracic Inlet, Cervico, thoracic spine, lumbosacral spine, sacrum, coccyscoliosis, kyphosis, flexion, extension and neutral.

(ii) Bones of the thorax: Sternum ribs.

(iii) Skull: Land marks, Cranium, facial bones, maxilla, mandible, zygomata, T.M. joints, mastoids, petrous bones, optic foramen, sells turcica, P.N.S.

C. (i) Chest: Chest in teleradiography, chest supine & portable, Lardotic, apicogram and MMR.

(ii) Abdomen: Preparation, indication and contraindication, acute abdomen, pregnancy abdomen for multiplicity maturity and foetal abnormality. Pelvirnetry.

(iii) Soft tissue: Neck and breast.

(iv) Emergency Radiography: Bedside radiography, O.T. Radiography.

(v) Radiography for age evidence: Bone age evidence.

(vi) Dental Radiography: Occlusal view, Dental X–ray, Panoramic view.

PRACTICAL

Time: 3 Hours *Marks: 70*

- Taking X–ray of all the part of the human body as per the theory syllabus. **25**
- Checking all parameters. **20**
- Steps to be taken for radiography. **25**

Note: All the experiments based on syllabus should be performed by the students during the session.

Marking Scheme 70

Distribution of Marks

I. Any two experiment based on syllabus given. **30**

II. Viva voce. **30**

(i) Questions related to the experimental assigned.

(ii) Questions based on other remaining experiments given in the syllabus.

III. Sessional work. **10**

Maintenance of records.

Lab and On–the–job Training.

CLASS–XII
ELECTIVE
RADIOGRAPHY–II (668)
(SPECIAL INVESTIGATION, IMAGING AND RADIOGRAPHY)
THEORY

Time: 2 Hours ***Marks: 30***

I. (i) Pathology: Definition, cell growth, cell deformities, cell damage, defence mechanism, cell repair. **10**

(ii) Neoplasia: Benign & Malignant including its mode of growth and matastasis.

(iii) Radiation: Local and systemic.

(iv) Radiotherapy techniques.

(v) Emergency in Radiology.

II. (i) Contrast media. **10**

(ii) Urinary Tract: I.V.P., Retrograde Pyelography, Cystourethrography. Presaral Insufflation.

(iii) Biliary Tract: Oral cholecystography, I.V.C, Trans hepatic percutanous cholangiography pre-operative cholangiography – T-tube cholangiography, E.R.C.P.

(iv) Tomography: Principle, equipment and types of movements, procedure.

(v) Venography: Splenoportovenography, Peripheral venography.

(vi) Lymphangiography.

(vii) Marnmography and Xeroradiography.

(viii) Radiculography.

(ix) Dacrocystography.

III. (i) Gastro-intestinal Tract: Ba. swallow, Ba. meal upper G.I.T., Ba, meal follow through, Ba. Enema. **10**

(ii) Female Genital Tract: Hystero Salpingography, Gynecography, Placentography & Pelvinmetry.

(iii) Angiography: Carotid angiography, Fermoral arteriography, Aortography, Selective angiography etc.

(iv) CNS: Ventriculography, Myelography, Pneumoencephalography.

(v) Sialography.

(vi) Sinography.

(vii) Nasopharyngography.

(viii) Laryngography.

(ix) Bronchography.

(x) Arthrography.

(xi) Discography: to assist in various special investigative & imaging procedures & maintenance of the equipment.

PRACTICAL

Time: 3 Hours ***Marks: 70***

1. Radiography in various positions for all the special radiological procedures using contrast media, as per syllabus. **34**
2. Positioning & treatment of various cancer patients using.
   (a) prescribed filters/wedges. **18**
   (b) protecting various organs. **18**

Note: All the experiments based on the syllabus should be performed by students during the session.

Marking Scheme **70**

Distribution of Marks

I. Any two experiments based on syllabus given. **30**

II. Viva voce. **30**
   (i) Questions related to the experiments assigned.
   (ii) Questions based on other remaining experiments given in the syllabus.

III. Sessional work. **10**
   Maintenance of records.
   Lab and On–the–job Training.

CLASS–XII
OPTIONAL
RADIATION PHYSICS (666)
THEORY

Time: 2 Hours ***Marks: 30***

I.
- Latent images formation and its processing. **10**
- Various units used for measuring radiation–Roentgen, rad and rem.
- Construction of X–ray tube, X–rays–its production and properties.
- Ionization chambers, G.M. Counter and Scintillation Counter, Interaction of X–ray with matter.
- Quality and quantity of X–rays, HVT, linear absorption coefficient, Grid, Cones and Filters.
- Inverse square law, scattered radiations and appliances used to reduce it.

II. Radioactivity **10**
- Curie, Half life, decay factor.
- Details about radium, cobalt and caesium.
- Doses–dose and dose rate, exposure dose, exit dose, surface dose, depth dose, isodose charts and their uses.

III.
- Radiation Hazards, Protection against it, film badge, pocket ionisation chamber, maximum permissible dose. **10**

PRACTICAL

Time: 3 Hours ***Marks: 70***

1.	Verification of Inverse Square law.	**7**
2.	Calibration of X–ray machine.	**7**
3.	To study the affect of KV and MAS.	**7**
4.	Find out the HVT of a given beam.	**7**
5.	To check the lead apron for any crack.	**7**
6.	Find out whether the glass in the screen in lead glass or ordinary glass.	**7**
7.	To survey the X–ray control for radiation.	**7**
8.	Demonstrate that the intensifying effect of X–ray intensifying screen is due to light produced by flouro–screen and not by the X–ray.	**7**
9.	Demonstrate the use of Grid/potter–bucky diaphragm and radiographic contrast.	**6**
10.	Demonstrate the effect of improper centering of X–ray tube.	**4**
11.	Verification of optical and radiation field coincidence.	**4**

LIST OF RECOMMENDED BOOKS

1. Text Book of Radiology for Technicians by Dr. Satish Bhargava.
2. Anatomy & Physiology for Nurses by Evelyn C. Pearce.
3. Anatomy & Physiological by Kumber–Gray–Stacpoles.
4. Surface & Radiological Anatomy by Halim Das.
5. Basic Physics in Radiology by Kemp & Oliver.
6. Radiation Physics in Radiology by R. Oliver.
7. X–Ray Equipment for Student Radiographers by D.N. & Chesney.
8. X–Ray Physics & Equipment by Jaundrell, Thompson & Ashworth.
9. Fundamentals of X–ray & Radium Physics by Joseph sely.
10. Principle of Radiographic Exposure & Processing by W. Fuch.
11. Radiographic Positioning by R.C. Clark.
12. Radiographic Photography by D.N. & N.O. Chesney.
13. Radiotherapy for Beginners by Walter & Miller.
14. Radiotherapy by Priscilla Barnes Dvis Roos.
15. Radiotherapy by Robert Tiffany.
16. Diagnostic Radiography by J. Bryan.
17. Manual of Radiography issued by Director General Armed Forces Medical Services (INDIA).
18. X–Rays, their Origin, Doses & Practical Application by W.E. Schall, Publisher–Bristol, Johri Wright & Sor Ltd.
19. Clarke's Positioning in Radiography by Louis Kreel, Ilford, William Heinemann, Medical books Ltd., London.

LIST OF TRAINING INSTITUTIONS

- All Medical College Hospitals.
- All Hospitals where well established Radiology Deptt. exist.

LIST OF EMPLOYING AGENCIES

- Medical College Hospitals.
- Central & State Govt. Hospitals, Autonomous bodies & Semi Govt. Hospitals.
- Primary Health Centres.
- Polyclinics and Nursing Homes.
- Private Hospitals.
- Private Clinics.
- Veterinary Hospitals and Colleges.
- Industrial Establishments e.g. Naval Dockyard.
- Armed Forces Medical Services.
- Scientific and Research Institutions.
- Agricultural Institutions.
- Teaching Colleges, Hospitals of other Indian system of Medicine (Homeopathic, Ayurvedic and Unani)

QUALIFICATION OF TEACHER

1. Qualified Radiologist MD with three years experience.

OR

2. B.Sc. Radiography OR Diploma Medical OR +2 CBSE X–Ray Technician/Lab Technician (Radiography) with 10 years experience in Hospital recognised by DHS/DMS/DME.

SUGGESTIONS

- X–ray technician course in very lucrative, offering, right career prospect.
- An Assessment should be made regarding demand in both wage and self employment in the country and aboard before starting the course.
- The candidates should be made aware of the career prospect in wage employment, and the fact that setting up of even a small X–ray clinic involves at least a lac of rupee in equipment itself. However, if X–ray technician wishes to put up his own X–ray plant he will have to seek help of radiologist for interpretation of X–rays.
- The course is practically oriented one and hence the attachment for training has to be in well equipped radiology deptt. of hospital.
- Normally not more than 6 students be attached to one hospital.
- Anatomy, Physiology and Pathology – Should be taught be Medical doctor while general physics can be taught by Physics teacher however Radiation Physics has to be taught by Radiological Physicist.
- Dark room techniques, General Radiography special Investigations and Radiotherapy should be taught by qualified X–Ray technician and Radiological.
- Radiation Physics practical have to be performed in the Radiology Deptt. of the Hospital in XII class.
- The attachment of the students for practical training should be in morning session of the Hospital in class XII.
- The Apprenticeship should be preferably a paid one and for a minimum period of one year duration.

SUGGESTED LIST OF EQUIPMENTS AND CHEMICALS

(for a batch of Six Students)

X–Ray Equipment

- X–Ray machines – 300 M.A.s.
- Portable Machines (Automatic & Manual).
- Personal Radiation Monitoring Services from B.R.C.
- M.M.R.
- Ultrasound.
- Cancer treatment facility should be available in the hospital, Additional facility to be provided under the scheme for the course.
- Computer – P.C.
- Portable Ultrasound.
- Optional.

  CT MRI, Cobalt etc.

Radiation Physics

1. Secondary Standard Dosimeter.
2. X–Ray Dosimeter.
3. Survey Meter.
4. Copper Sheets: 25, 5 & 1 mm thick–size 30 x 30 cms.
5. Perspex Sheets: 10cm, 5cm, 30 x 30 cms.
6. Intensifying screen of 3 sizes – 15" x 12", 10" x 12", 10" x 8".
7. Aluminium sheets 1 mm thick size – 3' x 3'.
8. Film Hangers – various types of above sizes 3.

Dark Room Material

- Plastic buckets, glass rods, glass beakers.
- Developer, Fixer.

Anatomy & Physiology

1. Human Skeleton, various coloured charts depicting various systems.
2. Anatomical models of detailed cross section of Human body in different sections.

SUGGESTED CONTACT ADDRESS FOR SUPPLY THE MATERIALS

X–Ray Equipment, C.T., Ultra Sound & MRI

- Picker International.
  A–12, Sujan Singh Park, New Delhi-110003.
- Siemens India Ltd.
  Medical Engineering Division, 4–A, Ring Road, I.P. Estate, New Delhi-110002.
- International General Electric (India) Ltd.
  34–Bhagat Singh Marg, New Delhi-110001.

- INRAYS
  Plot. 356/381, Sector-24, Faridabad.
- Radon-House Pvt. Ltd.
  7, Sardar Shakar Raod, Calcutta-700036.
- Shimaza Teshaiwal Bros. Pvt. Ltd.
  198, Jamshedji Tata Road, Bombay.

CT & Ultra Sound

- Blue Star Ltd. (Hitachi)
  414/2 Bir Sarakar Marg, Parbha Devi, Bombay.
- Philips India Ltd.
  3, Haddows Road.

X–Ray Accessories

- Rege Cine films
  504, Deep Shika Building, 8, Rajendra Place, New Delhi-110008.
- Agfa Gaevart India Ltd.
  Moti Nagar, New Delhi.
- Umasons, X–ray Equipment
  Nirlep House, G.D. Ambedkar Marg, Parel, Bombay-400012.
- Kiran X–ray Screens
  509, Delamal Chambers, 29, Sir V. Thackersey Marg, Bombay-40020.
- Royal Surgical X–rays,
  Tiwari Bhavan, Alambagh, Lucknow-5.
- Electromach-Corporation
  Madhyamgram, 24 Paraganas, West Bengal.

CHEMICALS & FILMS

1. Hindustan Photo Films – Rajendra Place, New Delhi.
2. Sakura Films – Chawri Bros, 21, Darya Gang, New Delhi-110002.
3. German remedies L Td. – PB. No. 6570, Bombay-400018.
4. May & Baker India Ltd. – M & B House, Worli, Bombay-400025.
5. Eskay Fine Chemicals-IS, Matew Road, Bombay-400004.
6. Win-Medicare Pvt. Ltd. 14 Floor, Hemkunt Tower, 98 Nehru Place, New Delhi-110019.

HEALTH CARE SCIENCE

1. Introduction

Undisputedly, the wealth of a country is judged by the health of its people. Worldwide, nations are seeking viable answers to the question of how to offer a health care system, which leads to improvements in the health status of their citizens. In our view, health care in India is the responsibility of the community as a whole. A collaborative approach, which involves financial support, strategic planning and health prioritizing legislation, involves the government, community leaders, and private and public health care professionals. Here in India we must encourage individual, family and group participation in taking care of their physical, mental and emotional health and provide venues for doing so. We need to support an increase in health seeking behaviours motivated by education, through the school system, civic groups and public information.

Faults of the country's medical system have become apparent within the last decade as economics forced hospitals to begin amalgamating services and reducing staff, thereby increasing clients' access to timely services. From years of evidence, public and private health care understands the need to view health care from a business perspective; however, without losing sight of the need to provide high quality, accessible services. Indeed, we must strive to improve the health care system by creating an environment that encourages and rewards quality of care by the professionals who are providing the services. We are seeing to do more than maintain the status quo of our community's health, and instead to improve on the health status of all concerned. Through tightly coordinated partnerships with medical, social, educational, business, civic and religious organisations of this country, we can develop a comprehensive and coordinated health care system.

This curriculum on **Health Care Science** has been developed for a two year new course at 10+2 stage. It has been so designed that the trainees on completion of the course will be competent to work as General Duty Assistants (GDAs) and go up in ladder as supervisor in Hospitals and Nursing Homes, to start their own self-employment ventures. The Course intends to impart both theoretical knowledge and practical training, suited for both self and wage employment.

Scope and Prospects of Health Care Science Course

This forms a good basic course for healthcare sector, after which the pass out can either join the healthcare service system as a GDA or go for higher education (Vertical Mobility) in the health care sector related courses (advanced courses in the health sector).

Pass out of this course can be good multi-skilled worker for the healthcare industry, who can handle a number of jobs depending upon where he/she is posted.

2. Employment Opportunities

- General Duty Assistant (GDA) in a hospital.
- General Duty Assistant in a Nursing Home.
- Front Office Assistant (FOA) in hospitals.
- Patient Care Coordinator (PCC) in a hospital.
- Sanitary Assistant in a hospital.
- Ambulance Assistant.
- Health Worker.
- Marketing Assistant (Health Care).
- Health Functionary in NGOs and voluntary organizations.
- Medical Emergency Assistant.

Vocations After Higher Education

- Nursing.
- Pharmacy.

- Medical Transcription.
- Alternative Medicine Specializations (Unani, Ayurveda, Siddha, Homeopathy, Naturopathy).
- Paramedical Technicians.

3. Objectives of the Course

The main objective of the course is to develop professional competency and employable skills in General Healthcare.

The specific objectives are.

- To demonstrate understanding of Anatomy, Physiology and Dietetics in relation to general healthcare.
- Develop understanding of basic principles of healthcare delivery services.
- To deal with the customers/patients efficiently in the area of healthcare.
- To efficiently support the health care's personnel in looking after the patients/customers.
- To impart basics knowledge of Healthcare Services System.
- To be able to impart basic health education to the customers/patients.
- Communicating effectively with the customers/clients.
- To create an understanding of Healthcare Industry.
- To train a multi-skilled workers for the healthcare industry who can handle a number of jobs depending upon where he/she is posted in the hospital.
- This forms a good basic course for healthcare sector after which they can plan for vertical mobility to Diploma/Undergraduate courses.
- To provide a platform to identify advanced skills-based training in healthcare sector.
- To understand the principles of public health and have competency to implement National Health Programmes in the Community.
- To be able to manage/implement IEC activities in the community.

CLASS–XI
ELECTIVE
HEALTH CARE DELIVERY SYSTEM (728)
THEORY

Time: 3 Hours ***Marks: 60***

1. Health Care Delivery System: Staffing and their Functions **20**

(i) At Village Level.
  (a) Trained Birth Attendants.
  (b) Village Health Guides.
  (c) Anganwadi Workers.

(ii) At Sub-centre Level.
  (a) Female Health Workers.
  (b) Male Health Workers and their functions.

(iii) At Sector Level.
  (a) Male Health Supervisors.

(b) Female Health Supervisors.

(iv) At Primary Health Centre Level.

(a) Organization, Staffing and Functions.

(v) At Community Health Centre Level.

(a) Organization, Staffing and Functions.

(vi) At District Level.

(a) District Health Organization, Staffing and Functions.

(vii) At State Level.

(a) Health Department, Directorates.

(b) Tertiary Care Institutions.

2. Hospital Organization and Services — 20

Definition, Types & Functions of a Hospital.

Hospital as a System.

Clinical & Nursing Services

(OPD, casualty, ICU, wards, OTs, Nursing services, etc).

Diagnostic Services

Laboratory services & Radio imaging.

Support Services

(a) Housekeeping.

(b) Laundry & Linen.

(c) Kitchen & Canteen.

(d) Maintenance.

(e) Transportation/Transfer of Patients.

(f) Mortuary.

(g) Finance department.

(h) Personnel/HR department.

(i) Material & Purchase department.

(j) Public Relations department.

(k) Medical Record department.

(l) Pharmacy (Introduction to medication practices).

3. Medical Equipments — 10

- **Diagnostic Equipment** including medical imaging machines like x-ray machine, ultrasound, Magnetic Resonance imaging (MRI), Computerized Axial Tomography (CAT) – scans etc.
- **Therapeutic Equipment** including infusion pumps, medical lasers and LASIK surgical machines.
- **Life Support Equipment** that is used to maintain a patient's body functions including medical ventilators, heat-lung machines and dialysis machines.

4. Orientation to Specific Hospital Equipments — 10

- Ventilators.
- Monitors.

- Defibrillator.
- Infusion pump.
- X-ray machines.
- Incubator.
- Microscope.
- Petri dishes.
- Instant diagnostic tools (Urinometer, Glucometer, Pregnancy kit etc.).
- Endoscopes Equipments.
- Oxygen cylinder.
- Suction apparatus.
- ECG machine.
- Common Surgical Instruments (Names & functions).
- Boyle's Apparatus.

PRACTICAL

Time: 2 Hours ***Marks: 40***

1. Hand Hygiene **3**

Washing the hands properly with soap and water.

- Use of re-usable/disposable towels.

2. Vital Parameters Checking: Practical Training in **4**

- Checking Temperature.
- B. P.
- Pulse.
- Respiration.

3. Practical Training about Universal Safety Precautions (USPs) **3**

- Handling sharps and needless.
- BMW (Bio Medical Waste Management).
- Phlebotomy & I.V. cannulation.

4. Sterilization Procedures **2**

- Using Autoclave.
- Disinfection in rural setting.

5. Public Health **3**

- Chlorination of Water.
- Sanitary latrines.
- Sanitary disposal of waste.

6. Orientation Visits to Different Areas of the Hospital **15**

- Front Desk – Functions.
- OPDs – Cardiology.
  – ENT.
  – Neurosciences.
  – Urology.
  – Ophthalmology.
  – Medical OPD.
  – Skin (Dermatology) OPD.
  – Surgical OPD.
  – Pediatrics& Neonatal OPD.
  – Gynecology& Obstetrics OPD.
- Medical records Office
- Wards postings – Different wards on rotation.
- Acute care Areas – Casualty / ICU / Traumatology unit etc.
- Posting in Support services – Kitchen (Dietary), Laundry, etc.
- Laboratory Services Posting
- Radiology Deptt: – MRI.
  – C T Scan.
  – X – ray room.
  – Ultrasound.
- Intensive Care Unit (ICUs):
  - PICU – Pediatric Intensive Care Unit.
  - NICU – Neonatal Intensive Care Unit.
  - SICU – Surgical Intensive Care Unit.
  - MICU – Medical Intensive Care Unit.
  - CCU – Coronary Care Unit.
- Operation Theatre (OT) Rooms Posting.
- Pharmacy Posting.

(Note: Prepare report of the study visits and submit).

7. Demonstration of the Working of the Following Medical Equipments **10**

- Ventilators.
- Monitors.
- Defibrillator.
- Infusion pump.
- X-Ray Machine.
- Incubator.
- Microscope.
- Petri dishes.
- Instant diagnostic tools (Urinometer, Glucometer, Pregnancy kit etc.).

- Endoscopes Equipments.
- Oxygen cylinder.
- Suction apparatus.
- ECG Machine.
- Common Surgical Instruments (Names and functions).
- Boyle's Apparatus.

CLASS–XI
ELECTIVE
FOOD NUTRITION & DIETETRICS (729)
THEORY

Time: 3 Hours ***Marks: 60***

1. Food Nutrition 25

- Constituents of Food (Carbohydrates, Proteins, Fats, Vitamins and Minerals).
- The Process of Nutrition.
- Balanced Diet.
- Nutritional disorders (Protein energy malnutrition and Vitamin Deficiency Diseases).
- Anemia: Causes, Identification, Prevention and control.

2. Diet in Health and Disease 15

- Diet in Diabetes.
- Diet in Hypertension and Heart Disease.
- Diet in Gastro-enteritis.
- Diet in other gastro-intestinal diseases.
- Diet in urological disorder.
- Diet in other disorders.

3. Nutrition Education 10

- For pregnant and lactating women.
- For infants and children to meet nutritional needs across age groups, gender and life styles.
- For those suffering from common diseases (Tuberculosis, Anemia, Vitamin and mineral deficiency, Goitre).

4. Computer Applications in Health Care 10

- Basics of Computer including Internet.
- Usage of Computer in Hospital Administration (medical record keeping).

PRACTICAL

Time: 2 Hours ***Marks: 40***

Food Nutrition and Dietetrics

1. Preparation of ORS and usage. **7**
   - Home made ORS.
   - WHO Approved ORS Packets.
2. Posting in Hospital Catering Service. **4**
3. Posting in Dietetics Department of the Hospital. **4**
4. Project on Nutrition and Diet. **5**
5. Specimens & models: Identification & explanation. **10**
6. Project work on computer applications in healthcare documentation. **10**

CLASS–XI
OPTIONAL
ANATOMY & PHYSIOLOGY (730)
THEORY

Time: 3 Hours ***Marks: 70***

1. Definition of Anatomy & Physiology.
   (a) Description of various regions of the body. **3**
   (b) Elementary Knowledge of cells and tissues of the body. **3**
2. Elementary Knowledge of Anatomy & Physiology of different organs& systems. **2**
3. Sense Organs – Eye, Ear, Skin, Nose, Tongue. **7**
4. Skeletal System. **5**
5. Bone Structure & Types of bones, Joints & Muscles. **3**
6. Cardio vascular system. **6**
7. Respiratory System. **5**
8. Lymphatic System. **2**
9. Blood forming System. **6**
10. Digestive System. **6**
11. Uro-Genital System. **6**
12. Endocrine System. **3**
    (Name of the endocrine organs, locations and functions).
13. Reproductive System. **4**
14. Neurological System. **6**
15. Dental System. **3**

PRACTICAL

Time: 2 Hours ***Marks: 30***

1. Identification of bones, joints and muscles through use of charts and slides Skeleton's model and other models. **5**
2. Measuring Blood Pressure (BP) Temperature, Pulse, Respiratory rate, study of Blood Smear, Urine test for Protein & Sugar.

Under Microscope for blood components, study of tissues under microscope.

3. Identification of place of organs of body through: **5**
   - Charts.
   - Models.
   - Skeleton.
   - Name of Bones and joints.
   - Identification & description of Liver, Lungs, Brain & Kidneys and other body parts.
4. Anatomy & Physiology Record (every students has to make his/her own record). **5+5**

CLASS–XII
ELECTIVE
HEALTH EDUCATION, COMMUNICATION AND PUBLIC RELATIONS & PUBLIC HEALTH (728)
THEORY

Time: 3 Hours ***Marks: 70***

1. Health Education: Meaning, Definition, Objectives and Importance **4**

2. Communication for Health **7**

- Information: Definition and Components.
- The process of communication.
- Methods & media of communication.
- The concept of Information Education and communication (IEC) for health.
- Health Ethics.

3. Making Health Communication Effective **6**

- Inter personal methods of communication.
- Mass Media Methods of communication.
- Equipment for mass media communication.
- Modes, types and barriers of communication.

4. Patient Education for Common Acute Diseases **10**

- Dental Diseases.
- Diarrhea.
- Vomiting.
- Cough.
- Cough & breathlessness (Bronchitis).
- Asthma.
- Skin Diseases (e. g. scabies, boils, infected wounds).

5. Patient Education in Chronic Diseases **10**

- Diabetes.

- Asthma and Chronic Bronchitis.
- Hypertension.
- Arthritis.
- Ischemic Heart Disease.
- Obesity.
- Cancers.
- Other Chronic Diseases.

6. Personal Hygiene — 4

- Essentials of personal hygiene including personal grooming.
- Hand washing and its importance.
- Methods and pitfalls in hand washing.
- Prevention of food poisoning through proper personal hygiene.

7. Environmental Sanitation — 4

- Essentials of sanitation.
- Human faeces – methods of appropriate disposal.
- Faecal – oral contamination and Faecal – oral diseases.
- Methods of sanitation and hygiene to break faeco – oral transmission of diseases.
- Disposal of solid and liquid waste.

8. Sexuality Education and Family Life Education — 5

- Prevention of STDs (Syphilis, Gonorrhoea, Pelvic Inflammatory Disease (PID)).
- Prevention & control of HIV/AIDS.
- Safe sex.
- Universal safety precaution for control of HIV/AIDS.
- Planned Parenthood and Family Planning.

9. Public Relations in Health Care Service Institutions — 5

- Definition of public relation.
- Role and importance of public relations in health care service institutions.
- Role of General Health Assistant (GHA) in the hospitals.
- Staff-patient relationship.
- Doctor-patient relationship.
- Personal hygiene of hospital staff.
- Empathy Vs sympathy in patient care.

10. Public Health — 10

- Principles of Public Health.
- Immunization.
- National Health Programmes I (National Rural Health Mission including RCH II).

- National Health Programmes II (RNTCP, Malaria control, Blindness control, HIV/AIDS control, others).
- Disinfection of Water.
- Sanitation & disposal of Excreta.
- Methods of Disinfection.
- Data Collection.
- Basics of Medical Statistics like Mean, Mode, Median, Charts, Diagrams & Sampling Method.
- Techniques of Health Education.

11. Organizational Behaviour: Meaning, Importance of Human Relationship in Healthcare Institutions. **5**

- **Organizational Behaviour:** Meaning, need and importance, Internal and External human relations, factors affecting human relations, behavior in organizations at the individual and group level, effect of organization structure and process on behaviour.
- **Group Behaviour:** Group Dynamics formal and informal groups, Group decision making techniques, Team: Meaning, purpose, Type, Life cycle, Team work, Team building, team effectiveness.
- **Conflicts:** Nature, levels, effects, conflict resolution process, Transactional analysis – meaning, benefits.
- **Customer Relations**: Significance, How to deal with customers.

PRACTICAL

Time: 2 Hours ***Marks: 30***

1. Role play of Patient Education for any one of the item in Patient Education for Common Acute Diseases **5**

Or

Role Play of Education for any one of the item in 'Patient Education for chronic Disease.

2. Project work on Universal Safety Precautions for Control of HIV/AIDS. **6**

- Record work with suitable pictures etc.

Note: For serial no. 1 the situation can be given to the students and assume as Patients and health workers for Patient Education.

3. Visit to Five Houses in a Village (Students from Urban localities can visit Urban Slums in the City) and Collect Following Data. **5**

- Source of Water supply .
- Methods of Excreta Disposal.
- Health Status of Family Members like Height, Weight,.
- Collection of data available on the immunization card.

4. Demonstration of Water Chlorination **2**

- Sterilization of the water in a bucket.

5. Visit to DOTS Centre **4**

- Study the functioning of a DOTS centre.
- Prepare a chart on the duties & responsibilities of DOTS Providers.

6. Participate in Pulse Polio Campaign 3

- Procedure followed on the day of the campaign.
- Procedure on the subsequent days.

7. Preparation of Chart with Bar Diagram, Pie Chart, Line Diagram and Histogram 5

Note: Additional (Optional) please refer the concerned year senior school curriculum of CBSE.

CLASS–XII
ELECTIVE
BASIC CONCEPTS OF HEALTH & DISEASE AND MEDICAL TERMINOLOGY (729)
THEORY

Time: 3 Hours ***Marks: 70***

1. Definition of Health & Concepts Related to Health 15

- Primary Health Care, Secondary Care, and Tertiary Health Care.
- Promotive Health Care, Preventive Health Care, Curative Health Care, and Rehabilitative Health Care, Spiritual Health Care.
- Concepts of Social medicine, Preventive medicine and Community medicine and Public Health.

2. Concepts Related to Diseases 15

- Different kinds of diseases: Infectious/communicable/non-communicable & degenerative diseases.
- How interaction between disease causing agents (Physical, Chemical, Biological,) host and environment results in diseases.
- Modes of transmission of communicable diseases:
  - Diseases of Contact transmission.
  - Air-borne diseases.
  - Water borne diseases.
  - Vector borne diseases.

3. Promotion of Healthy Environment 5

- At individual level.
- At family level.
- At Community level.

4. Prevention & Control of Diseases 20

- Water safety.
- Food safety.
- Environmental sanitation (including safe disposal of solid & liquid wastes).
- Personal hygiene.
- Safe disposal of human excreta.
- Safe disposal of Bio Medical wasted (BMW) Management.

- Control of vectors and pests (control of house files, mosquitoes, rats, cockroaches etc.).
- Healthy housing & preventing of air pollution.
- Isolation procedures.

5. Medical Terminology — 15

5.1 Basics of Medical Terminology

- Words, Prefixes & suffixes used in medical terms (Symptomatic, Diagnostic and Operative terminology).
- Origin of medical terminology.
- Terminology to identify basic body systems, and vital signs.
- Distinction between the symptoms, signs and specific diseases.
- Determining the specialty by identifying the meaning of the word root.

5.2 Basic Word Roots, Prefixes and Suffixes

5.3 The Human Body in Health and Disease

- Terms related to pathology of cells, tissues, and glands.
- Types of diseases.
- Recognize different medical specialties and specialists.
- Terms used in different Departments of the hospital (Symptomatology, diagnostic entities, intervention methodology, equipment used etc.):
- Orthopaedics & traumatology.
- Digestive system.
- Circulatory and lymphatic system.
- Respiratory system.
- Gynaecological system.
- Obstetrics & Maternal & child care.
- Neurology & Psychiatry.
- Internal Medicine.
- General Surgery.
- ENT & Ophthalmology.

5.4 Coding of Diseases

- Introduction to coding & classification of Diseases.
- Introduction to Volume I & II of International Code of Diseases (ICD).

PRACTICAL

Time: 2 Hours — ***Marks: 30***

1. A.V. Aids – Making charts, Models, Pamphlets etc. — 10

- Water Safety.

- Food Safety.
- Healthy Housing and Prevention of air pollution.

2. Safe Disposal of Biomedical Waste Management — 10

- Demonstration with different specimen and color coded containers i.e. General waste, Sharps, Blood contaminated Swabs, Swabs or materials contaminated with any body fluids, Plastic wastes, Broken Glass pieces.

3. Medical Terminology — 10

- Practical setting exposure to procedure and tests used in hospitals.

Note:

Additional (Optional)

Please refer the concerned year Senior Secondary Curriculum of CBSE.

CLASS–XII
OPTIONAL
FIRST AID & EMERGENCY MEDICAL CARE (730)
THEORY

Time: 3 Hours ***Marks: 60***

1. First Aid — 28

- First Aid: Definition.
- First Aid Kit: Constituents and uses.
- Cardio-Pulmonary Resuscitation (CPR).
- First Aid in Road accidents.
- Control of Bleeding; epistaxis, cut – wounds, use of tourniquets.
- First Aid for fractures.
- Splinting the suspected fractures.
- Transporation of the injured.
- First Aid in Burns & shock.
- First Aid in Drowning.
- First Aid in Poisoning.
- First Aid in Electrocution.
- First Aid to Unconscious individual.
- Equipment & Procedures in Emergency care unit.

2. Emergency Assistance in — 12

- Shock.
- Snake bite.
- Poisoning.
- Fractures.
- Seizures.

- Electrocution.
- Drowning.
- Road accidents.
- Blast injuries.

3. Disaster Management **10**

- In Fire.
- In Floods & Cyclones.
- In Earthquakes.
- In Drought.
- Train Accidents / Aircraft Accidents.
- In Bomb blasts.

4. Medical & Surgical Emergency Management **7**

5. Safety Aspects in Healthcare (Needle stick injuries, vulnerable patients, identification of patients.). **3**

PRACTICAL

Time: 2 Hours ***Marks: 40***

1. Visit to the Casualty – Orientation to **15**

- Receiving casualty and Immediate actions.
- Introduction to medicines used in Casualty Department.
- Equipment used in Casualty.
- Oxygen cylinders & Oxygen mask.
- Aspiration equipment.
- B. P. Apparatus.
- Intravenous infusion.
- Ventilator.
- Monitors.

2. Visit to Fire Office **5**

- Acquaintance with fire fighting methods.
- Equipment for fire fighting.

3. Visit to Red Cross Society **5**

- Blood Bank Activities of Red Cross.
- First Aid training activities of Red cross.

4. Transfer of Patients **10**

Drills on Transferring Patients

- Bed to wheel chair.
- Bed to trolley.

- Trolley to Trolley.
- Trolley to bed.
- Transferring post operative patients.

5. Project Work on First Aid **5**

Note: Additional (Optional) Please refer the concerned year senior school curriculum of CBSE.

LIST OF RECOMMENDED BOOKS

1. First Aid and Emergency Medical Care, Theory, Class–XII, Published by CBSE.
2. First Aid and Emergency Medical Care, Practical, Class–XII, Published by CBSE.
3. Health Education, Public Relations and Public Health, Theory, Class–XII, Published by CBSE.
4. Health Education, Public Relations and Public Health, Practical Manual, Class–XII, Published by CBSE.
5. Basic Concepts of Health & Diseases and Medical Terminology, Practical Manual, Class–XII, Published by CBSE.
6. Basic Concepts of Health & Diseases and Medical Terminology, Text Book, Class–XII, Published by CBSE.
7. Anatomy & Physiology Theory, Class–XI, Published by CBSE.
8. Anatomy & Physiology Practical, Class–XI, Published by CBSE.
9. Health Care Delivery System, Hospital Organization and Services, Medical Equipment and Technology, Paper–II, Practical Manual, Class–XI, Published by CBSE.
10. Health Care Delivery System, Hospital Organization and Services, Medical Equipment and Technology, Paper–II, Practical Manual, Class–XI, Published by CBSE.
11. Food Nutrition & Dietics Theory, Class–XI, Published by CBSE.
12. Food Nutrition & Dietics Practical, Class–XI, Published by CBSE.
13. Nutrition and dietetics.
14. First Aid and Nursing.
15. NCERT, Anatomy (for MLT): NCERT, New Delhi. 1988.
16. NCERT, Physiology (for MLT) : NCERT, New Delhi 1988
17. World Health Organization (WHO), International Classification of Diseases (WHO).
18. Health Information of India – Ministry of Health & Family Welfare, Government of India.
19. Consumer Protection Act & Medical Profession – Yadava B.S.
20. Medical Terminology for Health career by E. Thonger, Alice and Burc, EMC.
21. For comprehensive reference material. Precis/handouts prepared by AHA should be made available to the students.

LIST OF COLLABORATING INDUSTRIES & INSTITUTIONS

- PSS Central Institute of Vocational Education.
- Max Healthcare Institute Limited of Medical Excellence.
- Fortis Healthcare Limited.
- Federation on Indian Chambers of Commerce & Industry (FICCI).

- Confederation of Indian Industry (CII).
- General Hospitals.
- Primary Healthcare Centers.
- Health Education Departments.
- Para Medical Institutions.
- Hospital Laboratories.
- Hosmac Foundation.
- National Institutes of Health & Family Welfare could be asked for collaboration.
- Academy of Hospital Administration (AHA).

LIST OF EQUIPMENTS AND SOFTWARE

Medical monitors, allow medical staff to record patients' vital parameters Monitors may measure patient's vital signs and other parameters including ECG, EEG, blood pressure, and dissolved gases in the blood.

Medical laboratory equipment automates or helps analyze blood, urine and gases.

The equipment needed includes:

1. Phlebotomy & Intravenous (i.v.) Cannulation Kit.
2. First Aid equipment.
3. Skeletons, charts and posters.
4. Models for all parts of body (different organs and organ system).
5. Microscopes.
6. Hand washing equipment.
   - reusable towels.
   - pumice stones (for scrub wash).
   - soap & water.
   - alcohol hand rubs.
7. Biomedical Waste (BMW) Containers and Syringe & Needle destroyers – samples of different sizes containers.
8. Slides cover slips, various stains.
9. Nutrition related charts and posters.
10. Computer and printer – with Internet connection.
11. B. P. apparatus – dial type, electronic type and mercury type.
12. Thermometer.
13. Glucometer.

LIST OF VENDORS & MANUFACTURERS OF THE EQUIPMENT

Computer Code

- 3M
- Acuson
- ATL
- Pentax
- Physio Control
- Puritan Bennett
- Abbott
- ADAC
- Baxter
- Philips
- Picker
- Quinton

- Fisher Scientific
- Siemens
- GE
- Sony
- Hill – Rom
- Spacelabs
- HP
- Stryker
- Karl Storz
- Toshiba
- Kodac
- Welch Allyn
- Lorad
- Zoll
- Marquette
- Philips
- Nellcor
- Pentax
- OEC
- Picker
- Ohmeda
- Physio Control
- Olympus
- Quinton

HEALTH AND BEAUTY STUDIES

Introduction

This curriculum on Health Care and Beauty Culture has been developed for a two-year vocational course at +2 stage. It has been so designed that the trainees on completion of the course will be competent to start their own health care and beauty culture clubs, operate and care the equipment used for the purpose. The course intends to impart both theoretical knowledge and practical training most suited for both self and wage employment.

Objectives

1. The students after undergoing this course should be able to demonstrate understanding of anatomy and physiology, dietetics in relation to beauty culture and hair dressing.
2. Develop understanding of basic principles, properties, types of various cosmetics application and their effects.
3. To operate, handle and care of the equipment, implements used in beauty culture and hair dressing.
4. To treat the clients efficiently in the area of beautification and care of the body and hair.
5. To diagnose and treat abnormalities, correction of figure faults, skin and hair.
6. To impart basic knowledge of setting up a saloon/manufacturing of cosmetics.
7. To develop knowledge of cosmetics and its preparation for different purposes.
8. To be able to deal with the problems of the clients in case of mishaps or any problem.
9. To be a confident, in display of beauty/hair product and its use.
10. To train the students in practical skills to care in maintaining sound healthy skin and hair.
11. To train the clients in body perfection through yoga exercises.
12. Communicating effectively and clearly to the client while giving treatment.

CLASS–XI
ELECTIVE
BEAUTY & HAIR (745)

Time: 2.5 Hours ***Marks: 50***

SECTION–I: BEAUTY

Unit–I: Skin Care **12**

(a) **Facials**

- Structure of skin.
- Types of Skin – Normal/Dry/Oily/Combination.
- Knowledge of material, implements & equipment.

(b) **Facial Massage**

- Basic massage manipulation.
- Preparation of client.
- Procedure for plain facial, precaution and reminder.

(c) **Facials**

- Facial treatment for different skin type – preparation, procedures & precautions.
  - (i) Oily – Galvanic & exfoliation.

(ii) Dry – paraffin, gauze facial.

(iii) Ageing – Thermo herb.

(iv) Face packs and masks according to skin type.

(v) Contraindication.

Unit–II: Superfluous Hair 7

- Factor responsible for unwanted hair.
- Various terminology used for superfluous hair.
- Various methods of hair removal.
- Depilatory method of hair removal.
  - (i) Shaving.
  - (ii) Depilatory cream.
- Epilatory method of hair removal.
  - (i) Threading.
  - (ii) Waxing.
  - (iii) Laser/Thermolysis/Electrolysis (Only basic knowledge).

Bleaching

- Theory of bleach
- Patch test of batch.
- Types of bleach.
- Knowledge of raw material/implements.
- Preparation & procedure of bleach.
- Precaution & reminder.

Unit–III: Manicure & Pedicure 9

Nail Malformation

(a) **Nail Disorders**

- Blue nail.
- Bruised Nail.
- Corrugation.
- Hang nail/agnail.
- Hypertrophy/thickening of nails.
- Onychphagy.
- Nail Biting.

(only definitions/knowledge to be given).

(b) **Nail Diseases**

- Nail fungus.
- Onychia .
- Paronychia.

(only definition/knowledge to be given).

Manicure

- Types, preparation, procedure/massage technique, material equipments and implements precautions and reminders.

Pedicure

- Types of pedicure, procedure/massage technique, knowledge of raw material required, equipments/ implements, precaution & reminders.
- Knowledge of footbath.

SECTION–II: HAIR

Unit–IV: Anatomy of Hair — 5

- Structure of Hair.
- Types of Hair.
- Hair Growth.

Unit–V: Scalp Massage — 3

- Definition of massage.
- Massage manipulation.
- Benefits of massage.
- Trolley setting.
- Procedure of scalp massage.

Unit–VI: Shampooing and Conditioning — 4

- Types of shampoo & conditioners.
- Trolley setting for shampoo.
- Preparation of client.
- Procedure of shampoo.
- Precautions and contraindications.
- Mehandi application procedure, benefits and contraindications.

Unit–VII: Hair Cutting — 10

(i) **Principles of Cutting**

- Shape of Head, Sectioning, Elevation, Cutting lines.
- Hair growth patterns.
- Hair Shaping.
- Precision Hair Cutting.
- Elevations.
- Procedure of Hair Cuts.

(ii) **Wet Styling**

- Roller Setting.
- Blow Drying.

(iii) **Thermal**

- Pressing Machine.
- Electric Rollers.
- Curling Tongue.
- Crimping Machine.

(iv) **Styling**

- Factors to be considered before styling (Facial Shape, Profession, Age, Occasion, etc.).
- Judas.
- Plaits/Braids.
- Updoos (Use of accessories).

PRACTICAL

Time: 2.5 Hours ***Marks: 50***

SECTION–I: BEAUTY

Unit–I: Facials 12

(a) Basic trolley setting for facial.

(b) Analysis of Skin.

(c) Cleansing – superficial (pre-facial).

(d) Deep Cleansing Treatment.

(e) Massage manipulations on face, neck and back.

(f) Use of facial massager.

(g) Choosing of facial product/face pack/face mask as per the skin type (professional/home remedies).

(h) Application & Removal.

(i) Facial treatments for different skin types.

- Basic trolley setting.
- Analysis of skin type/skin problem.
- Procedure for Oily – Galvanic & exfoliation.
- Procedure for Dry – paraffin, gauze facial.
- Procedure for Ageing – Thermo herb.

(j) Precautions and Reminders.

(k) Contraindications.

Unit–II: Superfluous Hair 8

(a) Judging of brow length.

(b) Shape of eye brows.

(c) Method of eye brow shaping.

- Threading (self, professional).
- Tweezing.

(d) Basic Trolley Setting.

(e) Preparation of Client.

(f) Procedure of Depilatory methods – Shaving and Depilatory Creams.

(g) Procedure of Epilatory Methods.

- Threading.
- Waxing.

(h) Precautions and Reminders.

(i) Contraindications.

(j) Bleaching.

- Basic trolley setting for bleach.
- Patch Test/Pre-Bleach Treatment.
- Procedure for different types of bleach cream powder.
- Moisturizing/cold compression (post-bleach treatment).
- Precautions and Reminders.
- Contraindications.

Unit–III: Manicure/Pedicure 8

(a) Basic table/counter setting set up.

(b) Selection of nail shape and shaping of nail.

(c) Procedure of Plain Manicure.

- Oil Manicure.
- French manicure.
- Booth manicure.
- Spa manicure.
- Nail Art.

(d) Procedure for pedicure – paraffin, electric pedicure.

(e) Hand massage and foot massage techniques.

(f) Precautions and Reminders.

(g) Contraindications.

SECTION–II: HAIR

Unit–I: Anatomy of Hair 2

(a) Analyse the hair/texture/Porosity/Elasticity/Density with help of Dorma Scope/ Magnifying glass.

(b) nalyse the hair by break method, wet and stretch technique.

Unit–II: Scalp Massage 4

(a) Care of different hair types – Dry, oily, split, damaged, under nourished, chemically treated.

(b) Selection of Hair Oil and Hair Mask.

(c) Basic Trolley setting for head massage.

(d) Procedure of Scalp Massage treatment.

(e) Precautions and Reminders.

(f) Contraindications.

Unit–III: Shampooing and Conditioning 4

(a) Preparing the client for shampooing.

(b) Procedure.

(c) Use of conditioners and rinses for different hair types.

(d) Home remedies and professional remedies for different types of hairs.

(e) Mehndi application.

(f) Precautions and Reminders.

(g) Contraindications.

Unit–IV: Basic Hair Cutting & Styling 12

(a) Knowledge of cutting tools.

(b) Cleaning of cutting tools.

(c) Sectioning of hair according to hair growth patterns.

(d) Preparation of client.

(e) Procedures of:

- Trimming, Diagonal Forward and Backward Hair Cuts.
- Blunt cut, Tapered Cut, Graduation in long and short hair.

(f) Precaution and Reminders

(i) Wet Styling

(a) Procedure of blow drying.

(b) Roller setting-on base, off base, half base.

(c) Finger Waving/Gel Styling.

(ii) Thermal Styling

(a) Setting of basic trolley for thermal styling.

(b) Use of cosmetics for thermal styling.

(c) Procedures of Thermal Styling using different tools and equipment's-
Dryers, Pressing Comb, Electric Roller, Curling Tongue, Crimping Machine.

(d) Precautions and Contraindications.

(iii) Styling

(a) Back combing on the head and on switches.

(b) Styling on switches (inter locking, types of rolls, use of spray).

(c) Fixing of hair piece on client's head.

(d) Braiding – French plait, khajuri and other types of braiding.

CLASS–XI
ELECTIVE
HOLISTIC HEALTH (746)
THEORY

Time: 2.5 Hours ***Marks: 50***

Unit–I: Anatomy & Physiology 5

Knowledge of human body and A/P related to cosmetology & holistic health.

(a) Structures and functions of cell and tissues.

(b) Basic knowledge of various systems.

- Skeletal system (Detail study of facial & neck bones).
- Muscular system (Facial & neck in detail).

Unit–II: Diet and Nutrition 5

(a) Definition of health, food and nutrition.

(b) Function of food – Physiological, Social and Psychological.

(c) Food nutrients – Function, sources, deficiency and excess – Proteins, carbohydrates, fats, minerals (iodine, iron, calcium, phosphorous, potassium & sodium), Vitamins (water soluble B & C and fat soluble A, D, E & K), water, fibre.

(d) Food groups, concept of balance diet and meal planning.

(e) Diet for different age groups, food fads and fast foods.

Unit–III: Yoga & Body Care 15

Importance of yoga in cosmetology & holistic health.

(a) Evolution of Yoga.

(b) Ashtang yoga

(c) Sukshamvyamyam (1-48).

(d) Yogic balance diet.

(e) Basic asanas (sukhasan, padmasan, vajrasana, gomukhaasana, janushishasana, trikonasana, tarasana, katichakrasana, bhujangasana, shalbasana.

(f) Posture, correct posture (sitting, standing or walking).

Unit–IV: Indian and International Body Therapies 15

Indian

(a) Naturopathy.

- Basic principles of naturopathy.
- Elements of body.
- Treatment of body by.
  - Hydrotherapy.
  - Colour therapy.
  - Mudtherapy.

(b) Ayurveda.

- Tridoshas.

- Threegunas.
- Prakruti of body.
- Knowledge of Mukhelpa.

International

(a) Massage and its benefits.

(b) Five scientific movements of massage.

(c) Elementary knowledge of international massage therapy.

- Aroma therapy.
- Deep tissue massage.
- Lymphatic drain massage.
- Stone massage.
- Sports massage.
- Swedish massage.

Unit–V: Basic Health and Safety **5**

To meet minimum occupational standards.

- Basic hygiene Standards.
- Standard procedures for safety and cleanliness.

Unit–VI: Business Studies **5**

- Finding & keeping staff.
- Book keeping.
- budgeting.
- Marketing.

PRACTICAL

Time: 2.5 Hours ***Marks: 50***

Unit–I: Yoga, Ayurveda and Body Care **20**

(a) Practice of sukhshamvyamyas.

(b) Practice of various asanas as given in theory.

(c) Posture (study of correct posture, sitting, standing, walking).

(d) Viva – file work and project work.

Unit–II: Diet and Nutrition **10**

(a) Display of various food products which contains various nutrients.

(b) Seasonal diet, display of various diets.

(c) Diet planning for adolescent girl.

(d) Diet planning for putting on and reducing for girl (16-19yrs).

(e) Planning a standard balanced diet for a week.

Unit–III: Indian & International Therapies **20**

(a) Patron's consultation.

(b) Practical demonstration of five classical massage movements and practice of the same with use of various aroma oils and stones in massage.

(c) Swedish massage demo and practice.

(d) File/project work.

CLASS–XI

GENERAL FOUNDATION COURSE (501)

(Common for Health and Beauty Studies and Beauty Services)

Time: 3 Hours ***Marks: 100***

Part–I: (Compulsory to all Vocational Courses) *Marks: 50*

A. Business Management and Entrepreneurship 30

(a) **Entrepreneurship Orientation** **5**
Importance and relevance in real life: Emphasis on self employment.

(b) **Entrepreneurship Values and Attitudes** **5**
Innovativeness, Independence, Risk Taking, Analytical ability.

(c) **Entrepreneurial Motivation** **5**
Achievement Planning, personal efficacy, entrepreneurial goal setting.

(d) **Launching of a Business Venture** **15**
Identification of project, steps in setting up a business, information about various institutions providing assistance, project formulation.

B. Computational Skills 10

(a) Percentage, ratio & proportion, profit & loss, discount, simple and compound interest, population growth and depreciation of value of articles using logarithm. **6**

(b) Area and volume: rectangle, parallelogram, circle, cube, cone, cylinder & sphere. **4**

C. Environmental Education 5

(a) Environment and the society.

(b) Environment properties risks in different economic enterprises, in use of raw materials, in processing / manufacturing and designing.

(c) Poverty and environment.

D. Rural Development 5

(a) Agriculture, the back bone of Indian Economy.

(b) Rural development projects in India including Integrated rural development programme.

(c) Agro based rural industries.

(d) Community approach to rural development.

Part–II *Marks: 50*

Communication 20

Meaning: Importance of Communication Methods of Communication. Verbal Communication, Written Communication, Visual Communication, Graphic Presentation Slides.

Essentials of successful Communication.

Ability to express.

Ability to rationalise.

Ability to understand.

Emotional state of receiver and reaction.

Personality Development **30**

To develop confidence, poise & charm.

1. (a) Self confidence and personal charm in terms of etiquettes, behaviour, language, unhuried movements, manners, good sense of humour and effective voice.
   (b) Visual poise and Social poise.
2. Staff Relation-professional approach towards profession.
3. Care of skin techniques used for cleaning, vaporizing, moisturizing, nourishing and toning.
4. Importance and knowledge of make-up and hair.
   (a) Knowledge of cosmetics used for make-up and hair style.
   (b) Procedure of make-up.
5. Self Assessment
   (a) To analyse one's own good and bad points by highlighting strong points and improving weak points for enhancing on'e personality.
   (b) Selection of clothes, designs, pattern, colour in terms of age, body structure, climate, colour of the skin, occasion, professoin.
   (c) Personal Hygiene - Care of hair, skin, use of deodorant, antiperspirant, detail, hygiene, regular bath.

CLASS–XII
ELECTIVE
BEAUTY & HAIR (745)
THEORY

Time: 2.5 Hours ***Marks: 50***

SECTION–I: BEAUTY

Unit–I: Make-Up **5**

Introduction

(a) Brief history of Make-up.
(b) Objectives of make-up application.
(c) Cosmetics for make-up.
(d) Make-up brushes and other tools.
(e) Makeup colour theory.
(f) Contraindications.
(g) Health & Safety Precautions.

Unit–II: Basic Make-Up Application **5**

(a) Client Consultation.
(b) Determining Skin Type and Colour.

(c) Preparing the workspace.

(d) Selecting make-up colours.

(e) Preparation of Client.

(f) Preparation for make-up.

(g) Application of make-up

Unit–III: Corrective Make-Up 6

(a) Ideal face proportions and features.

(b) Analyzing features and face shape.

(c) Techniques of corrective make-up application for face, eyes, eyebrows, lips, skin tones, wrinkles.

Unit–IV: Special Make-Up Techniques 9

(a) Day make-up.

(b) Evening make-up.

(c) Bridal make-up.

(d) Fantasy Make-up.

(e) Ramp make-up.

(f) Theatre and Television make-up.

(g) Photographic Make-up.

(h) Makeup for mature skin.

(i) Basic Body Art/Tattooing.

SECTION–II: HAIR

Unit–I: Disorder of Hair and Scalp 4

(a) Hair loss – Types, reason and treatments.

(b) Canities (grey hair).

(c) Pediculosis.

(d) Dandruff.

Unit–II: Advanced Cutting & Styling 5

(a) Study of Facial Shape, Bone Structure, Body Structure, Profession, Age, Occasion.

(b) Hair Cutting and Styling as per Facial Shape.

(c) Selection of Tools.

(d) Procedures for latest trends and cuts (Short and Long both).

- **Advance Hair Styling**

(a) Evening Hair styles, party hair style, bridal hair style and ramp hair styles.

(b) Styling on Artificial Aids.

- **Permanent Waving/Straightening**

Unit–III: Permanent Waving 6

(a) Meaning of permanent waving.

(b) Principle of perming.

(c) Examination of the scalp.

(d) Perming techniques preparation and procedure wrapping techniques.

(e) Maintaining the record card & client's history.

(f) Test curl.

(g) Factors responsible for failure of perming and their solutions.

- **Straightening/Relaxing**

(a) Meaning of relaxing.

(b) Principles of relaxing.

(c) Examination of the scalp.

(d) Strand test of relaxer.

(e) Preparation & procedure of relaxing.

(f) Record card & client's history.

Unit–IV: Hair Colouring and Lightening 5

Hair Colouring

(a) Purpose of hair coloring.

(b) Law of colors – primary, secondary & complimentary.

(c) Types of Hair Coloring.

Temporary, Semi Permanent, Permanent

(a) Strand Test.

(b) Patch Test.

(c) Procedure of Hair Coloring.

(d) Precautions and contraindication.

Unit–V: Bleaching and Lightening 5

(a) Definition of bleaching.

(b) Chemistry of Bleaching.

- **Activating the Bleach**

(a) Causes of over Bleach.

(b) Choice of Bleach.

PRACTICAL

Time: 2.5 Hours ***Marks: 50***

SECTION–I: BEAUTY

Unit–I: Make-Up 25

- **Practice in Facial Make-ups**

(a) Trolley setting.

(b) Planning the make-up.

(c) Blending techniques for colors.

(d) Choosing make-up colors as per skin/hair, eye, clothing.

(e) Analysis of facial shape before make-up.

(f) Practice of make-up under different lights.

- **Corrective and Camouflage Make-up**
- **Special Make-up Techniques**

(a) Day make-up.

(b) Evening make-up.

(c) Bridal make-up.

(d) Make-up for mature skin.

(e) Theatre and T.V. make-up.

(f) Practice in Body Art/Fantasy Make-up.

SECTION–II: HAIR

Unit–II: Disorders of Hair and Scalp 3

(a) Herbal Treatments for Dandruff.

(b) Falling Hair.

(c) Greying Hair.

(d) Pediculosis groups and work.

(i) Labourer.

(ii) Sedantory worker.

(iii) Pregnant /lacting mother.

(iv) Diet for healthy skin and hair.

(v) File-projects-charts.

Unit–III: Advanced Cutting & Styling 6

- **Advance Hair Cuts (Short & Long)**

Hair Cutting and Setting as per:

(a) Facial Shape.

(b) Body structure.

(c) Profession.

(d) Age.

(e) Occasion.

(f) Fashion Trend etc.

- **Advance Hair Styling**

(a) Evening Hair styles, party hair style, bridal hair style and ramp hair styles.

(b) Styling on Artificial Aids.

Unit–IV: Permanent Waving/Straightening 6

- **Permanent Waving**

(a) Basic preparation of trolley for perming.

(b) PH testing knowledge of acidic / alkaline.

(c) Hair analysis.

(d) Preparing & planning the perm.

(e) Strand test.

(f) Sectioning & sequence of winding.

(g) Winding techniques – basic, spiral, directional, staggered (brick winding), Weave binding, double winding, piggy back winding processing & developing.

(h) Testing curl.

(i) Neutralization.

(j) Practice in other type of perming rods – chop sticks, u-stick, foam rollers etc.

- **Straightening/Relaxing**

(a) Preparation of trolley for relaxation.

(b) Analysis of Hair.

(c) Relaxing method & procedure – kinky/curly/coarse.

(d) Strand test for relaxing.

(e) Neutralization.

(f) Cleansing & conditioning.

(g) Contraindications.

Unit–V: Hair Colouring and Lightening 5

- **Hair Colouring**

(a) Selection of color -Study of color depth & tone.

(b) Application of different types of colors.

(i) Chemical.

(ii) Vegetable.

(c) Patch test (skin test, color test, priority test, incompatibility test strand test).

- **Bleaching and Lightening**

(a) Chemistry of bleaching.

(b) Color variants-high lightened, low lightened.

(c) Tipped, frosted scrunching, comb technique.

Unit–VI: Preparation of Herbal Cosmetics 5

(a) Face Pack.

(b) Hair Packs.

(c) Creams.

(d) Shampoos.

(e) Hair Oils.

(f) Nail Polish Remover.

(g) Depilatory Wax.

(h) Exfoliating Mask and Scrub.

CLASS–XII
ELECTIVE
HOLISTIC HEALTH (746)
THEORY

Time: 2.5 Hours ***Marks: 50***

Unit–I: Anatomy & Physiology — 5

Brief Study of Various Systems

(a) Nervous system.

(b) Endocrine system.

(c) Circulatory/lymphatic system.

(d) Digestive system.

(e) Excretory system (kidneys).

(f) Disorders in brief (joint, hormone, basic physiological).

Unit–II: Diet and Nutrition — 5

(a) Methods of Cooking and effect on food by dry heat, moist heat and use of oil.

(b) Technologies to improve the quality of food – germination, fermentation and fortification.

(c) Body Mass Index (BMI), BMR, expected height and weight for ages.

(d) Diet for life style related disorders: Obesity, underweight, Hypertension.

(e) Diet for summer, winter and rainy season.

(f) Diet for healthy skin and hair.

(g) Diet for weight loss.

(h) Sample diet for different age groups.

Unit–III: Yoga and Health — 15

(a) Surya namaskar (mantra and exercises 1-12).

(b) Shat kramas (1-6).

(c) Bhavshudhi.

(d) Asana.

- Suptvajrasana.
- Paschimutanasana.
- Ardhmatsendrasana.
- Konasan.
- Matsyasana.
- Virasana.
- Makrasana.
- Sinhasana.
- Chakrasana.
- Savasana.
- Sarvangasana.
- Halasana.

(e) Pranayama (1-8).

(f) Sthulvyamyas.

Unit–IV: Indian and International Body Therapies — 15

(a) Detail knowledge and study of shirodhara.

(b) Detail study of.

- hydro therapy.
- colour therapy.
- mud therapy (lepa).
- body wrap (hot & cold treatment) to detoxify the body.

(c) Jacuzee hydro massage.

(d) Modern trends in spa, medi–tourism, medi–spa.

(e) Acupressure massage.

(f) Shiatsu.

(g) Reiki.

(h) Detail knowledge of reflexology massage.

Unit–V: Basic Health and Safety **5**

To meet minimum occupational standards.

- Disease caused by Unhygienic practices.

Unit–VI: Business Studies **5**

- Planning and establishing of a Spa/salon.
- Spa menu.
- Stock control.
- Communication in Spa & beauty Industry.

PRACTICAL

Time: 2.5 Hours ***Marks: 50***

Unit–I: Yoga and Health **15**

(a) History and consultation of patron.

(b) Demo and practice of sthulvyamya.

(c) Demo and practice of suryanamaskar.

(d) Demo and practice of shat karma.

(e) Practice of all asanas as in theory.

(f) Practice of mudra and bandha.

(g) Practice of prayanama as in theory (1-8).

(h) file-project work.

Unit–II: Diet and Nutrition **10**

(a) Various method of cooking to protect nutritive value of food.

(b) Diet plan for various age groups and work.

- Labourer.
- Sedantory worker.
- Pregnant /lacting mother.

- Diet for healthy skin and hair.
- File-projects-charts.

Unit–III: Indian and International Body Therapies 25

(a) Demo and practice of shirodhara.

(b) Demo and practice of hydro therapy, colour therapy, mud therapy for various ailments (joint pain, high B.P, thyroid, diabetic).

(c) Body wrap (hot & cold).

(d) Spa treatments (head to toe).

(e) Demonstration and practice of reflexology massage.

CLASS–XII
GENERAL FOUNDATION COURSE (501)
(Common for Health and Beauty Studies and Beauty Services)

Time: 3 Hours *Marks: 100*

Part–I: (Compulsory to all Vocational Courses) *Marks: 50*

A. Business Management and Entrepreneurship 30

Management of Business

Elementary treatment/exposure to basic conceptual frame work of the topic listed below:

(a)= Basic Function. **6**

(b) Marketing Management. **6**

(c) Financial Management. **6**

(d) Production Management. **6**

(e) Personnel Management. **6**

B. Computational Skills 10

1. (a) Solution of linear equations and their application to problem of commercial mathematics. **5**

   (b) System of linear equations and in equation in two variables. Applications in formation of simple linear programming problems.

2. Statistics: Raw data, bar charts and Histogram; Frequency Tables; Frequency Polygon; Ogive; Menu, Median and Mode of ungrouped and grouped data; Standard Deviation; Introduction to Mortality tables; Price Index etc. Introduction to Computers. **5**

C. Environmental Education & Rural Development 10

1. **Environmental Education** **5**

   (a) Modernisation of agriculture and environment, irrigation, water logging, use of fertilisers, pesticides, soil erosion, land degradation (desertification and deforestation), silting and drying of water resources.

   (b) Rational utilisation, conservation and regeneration of environmental resources (soil, air, water, plant, energy, minerals).

2. **Rural Development** **5**

   Principles and goals of rural development, major problems/constraints in rural development in India.

Part–II *Marks: 50*

I. Meaning of Beauty Culture, personal qualities required/needed for a successful Beautician. **12**

II. The prerequisites and methodology and procedure for setting up one's own beauty clinic, details of equipment, machinery, furniture and tools. **12**

III. (a) Name of Equipment (Manual & Electric), slimming equipment. **12**

(b) Use of Equipment for Body correction, underweights, overweight.

(c) Precautions & Benefits.

IV. Project Report - visit to various saloons and institutions. **14**

Door to door survey (Make a Report).

Market survey.

Cosmetics - its make, types & cost.

– Availability in the market.

LIST OF RECOMMENDED BOOKS

1. Beauty and Hair, Student Handbook, Class XI, Published by CBSE.
2. Holistic Health, Student Handbook, Class XI, Published by CBSE.
3. Beauty and Hair, Student Handbook, Class XII, Published by CBSE.
4. Holistic Health, Student Handbook, Class XII, Published by CBSE.
5. Hall of Textbook of Cosmetology by Mary Healy, Reagents / Prentice Hall.
6. Great Hair by Davis Biton.

STANDARD LIST OF TOOLS AND EQUIPMENTS TRADE SKILL – I & II

S. No.	Trainees Personal Kit	Quantity
1.	Pack & Bleach Brush.	01 No.
2.	Nail Brush.	01 No.
3.	Head Band.	01 No.
4.	Eye Lash curler.	01 No.
5.	Manicure set.	01 No.
6.	Cuticle cutter.	01 No.
7.	Pedicure set.	01 No.
8.	Wax applicator.	01 No.
9.	Spray Bottle.	01 No.
10.	Small Bowls.	01 No.
11.	Make-up brush set.	01 No.
12.	Make-up sponge.	01 No.
13.	Artificial Eye lash set.	01 No.
14.	Black head remover.	01 No.

S. No.	Trainees Personal Kit	Quantity
15.	Towels.	As per requirement
16.	Dye brush.	01 No.
17.	Gloves.	01 No.
18.	Cutting Sheet.	01 No.
19.	Hair cutting scissor.	01 No.
20.	Setting Clips.	As required
21.	Bob pins.	As required
22.	Jura pins.	As required
23.	Open teeth comb.	01 No.
24.	Styling comb.	01 No.
25.	Tail Comb.	01 No.
26.	Switch stand.	01 No.
27.	Plain switch.	01 No.
28.	Swiggle.	01 No.
29.	Plaits.	01 No.
30.	Razor comb.	01 No.
31.	Hair Accessories.	As per requirement

TOOLS & EQUIPMENTS

S. No.	Description Name	Quantity
1.	Tray.	20 No.
2.	Manicure Bowls/ Pedicure Tubs.	20 No. each
3.	Vibro Massagers.	4 No.
4.	Wax Heater with Thermostat with double bowl.	06 No.
5.	Manicure Tables with lamps.	6 No.
6.	Stools for Manicure.	20 No.
7.	Complete Facial Machine Latest.	03 No.
8.	Vapozone Electronic.	02 No.
9.	UV Sterlizer.	04 No.
10.	Facial beds.	06 No.
11.	Hot plate.	02 No.

S. No.	Description Name	Quantity
12.	Heater.	02 No.
13.	Heat Convector.	02 No.
14.	Air Conditioner Split 2 ton with Stabilizer.	02 No. each Lab.
15.	Mirror Panel.	20 No.
16.	Saloon Chairs.	12 No.
17.	Hot Towel Cabinet.	02 No.
18.	Refrigerator.	02 No.
19.	Faculty Table Chair.	02 No.
20.	Manicure Trolley.	06 No.
21.	Facial Trolley.	06 No.
22.	Make- up colour mixing plate.	04 No.
23.	Equipment Trolley.	06 No.
24.	Professional Massager.	02 No.
25.	Muscle Stimulator.	02 No.
26.	Geyser 25kts.	02 No. each
27.	Immersion Rod 1500 wts.	04 No.
28.	Pedistation.	06 No.
29.	UV lamps 36w with timer for nails.	06 No.
30.	Wash Units (Basins).	04 No.
31.	Galvanic.	02 No.
32.	Almirah.	06 No.
33.	Display Board.	06 No.
34.	Hair Rollers (small, medium, and large).	12 dz. Each
35.	Perming Rollers (Ladder perm, star perm, chopsticks, wood perm, circle rod).	12 dz. Each
36.	Ringlette Rollers (small, Medium and large.	12 dz. Each
37.	Plain Bun.	20 No.
38.	Hair Clipper Mechanical.	12 No.
39.	Cutting Scissor.	12 No.
40.	Thinning Scissor.	12 No.
41.	Hair Dusting soft brush.	12 No.
42.	Wigs with skin parting/woven on net.	12 No.

S. No.	Description Name	Quantity
43.	Hair extension kits (Temporary) may be purchased as required after two years.	20 No.
44.	Neck Tray.	12 No.
45.	Dye Bowl.	12 No.
46.	Colour Scale.	02 No.
47.	Crimpling Tongue.	6 No.
48.	Curling Rod.	6 No.
49.	Pedestal Hood Hair dryer.	3 No.
50.	Hand Hair Dryer Heavy duty.	12 No.
51.	Hair Clipper Electrical.	6 No.
52.	Diffuser.	6 No.
53.	Scalp Steamer electronic.	2 No.
54.	Electric roller Set (20 rollers in 3 sizes).	3 No.
55.	Shampoo station with chair.	4 No.
56.	Dummy Head on stand with slip on.	20 No.
57.	Front wash basin.	4 No.
58.	Infrared Lamp.	4 No.
59.	Sterilizing Unit Wet.	2 No.
60.	Sterilizing Unit Dry.	2 No.
61.	Dressing Out chairs.	20 No.
62.	Trollies.	12 No.
63.	Student Lockers with 12 cabinets.	04 No.
64.	Saloon Chairs.	12 No.
65.	Curtains for lab.	As per requirement
66.	Back View Mirror.	12 No.
67.	Hair Curler Set.	01 No.

BEAUTY SERVICES

Introduction

This course will enable students to acquire qualification towards successful learning of beauty services. Throughout the studies they will gain the knowledge and skills to provide a variety of basic beauty treatments and services to clients. Skills will be taught where they are able to start their own entrepreneurship ventures.

CLASS–XI
ELECTIVE
NAIL TECHNOLOGY AND RETAIL (770)
THEORY + PRACTICAL

Time: 2.5+2.5 Hours ***Marks: 50+50***

A. Nail Technology 10+

1. **Knowledge of Nail Science**
   - Relevant Principals.
   - Health and safety procedures.
   - Anatomy and function of the lower arm and lower leg.
   - Structure and function of the lower arm and lower leg.
   - Anatomy of normal human nail.
   - Common problems of Nails & skin (Diseases and disorders of hands & feet).
   - Contraindications.
   - Health & care of skin and nail (during and after the treatment).

2. **Manicure and Pedicure Services** **10+10**
   - Prepare the service area and client.
   - Tools & Cosmetics.
   - Procedure of Manicure and Pedicure (Plain).
   - Arm and leg massage.
     (a) Types of manicure.
     (b) Hot oil manicure.
     (c) Paraffin wax manicure.
     (d) French Manicure.
     (e) After care advice.

3. **Nail Art** **10+10**
   - Prepare area & client for nail art service.
   - Nail cosmetics and design supplies.
   - Providing nail art services.
   - Create and apply nail design.
   - Types of nail art.

(a) Bullion beads.

(b) Pierced nail charm.

(c) Confetti decoration.

(d) Foil art.

(e) Respond to feedback and aftercare advice in maintaining nail design.

4. **Learning Activities**

5. **Suggested Answers**

B. Retailing **10+10**

1. **Conduct Financial Transaction**

(a) Operate point of sale equipment.

- Use point of sale equipment.
- Open and close a POST.
- Clear POST and transfer tender.
- Handle cash.
- Maintain change and cash float.
- Refund and exchange procedures.
- Complete transaction error records.
- Maintain adequate supplies of POST documentation.

(b) Perform point of sale transactions.

- Apply legislation.
- Implement workplace transaction procedures.
- Learn the transaction policies under EFTPOS.
- Complete sales.
- Complete client POS documentation.
- Process client sales in a timely manner.
- Remove and reconcile takings.
- Maintain cash float record sheet.
- Maintain transaction documents and register takings.

2. **Organise and Maintain Work Areas** **10+10**

(a) Organise work area.

- Maintain your work area.
- Primaces and recency theory.
- Housekeeping policy.
- Housekeeping duties.
- Clean your work area.
- Personal hygiene practices.

(b) Clean work area.

- Remove and dispose of waste.

- Remove potential hazards ensuring customer safety.
- Precautions while disposing.
- Hierarchy of disposal management.

3. **Learning Activities**
4. **Suggested Answers**

CLASS–XI
ELECTIVE
ARTS & SCIENCE OF MAKE-UP & RETAIL (771)
THEORY + PRACTICAL

Time: 2.5+2.5 Hours ***Marks: 50+50***

A. Art and Science of Makeup — 10+15

1. **Section–A: Demonstrate Retail Skin Care and Products**
   - Introduction.
   - Prepare Service Area & Client.
   - Identify client's skin care needs.
   - Contraindications.
   - Apply & remove skin care products.
   - Advice on further product use.

2. **Section–B: Design and Make-up** — **10+15**
   - Introduction.
   - Prepare Service Area & Client.
   - Identify client's skin care needs.
   - Contraindications.
   - Cleansing.
   - Analyses of face for make-up.
   - Corrective make-up.
   - Colour design principle to make up theory.
   - Design Make up plan.
   - Selection of equipment's & products.
   - Prevent cross infections.
   - Apply make-up.
   - Apply false make up.
   - Advice on further product use.

3. **Learning Activities**
4. **Suggested Answers**

B. Retail Make-up and Skin Care — 15+10

1. **Communicate in the Workplace**

- Establish contact with customers.
- Communicating in retail environment.
- Who is my customer.
- Communicate effectively with customer.
- Good telephone communication.
- Working in teams.
- What makes a good team.
- Avoiding and handling conflicts.
- Learn to Avoid conflicts in the team.
- Read and interpret retail documents.
- Complete retail documents in line with store policy.

2. **Work Effectively in Retail Environment** **15+10**
   - Introduction to retailing.
   - What is retailing/retail organization.
   - Types of jobs in retailing.
   - Career development.
   - Being responsible in the workplace.
   - Learn to present yourself appropriately at work.
   - Being non-discriminatory in the workplace.
   - State anti-discrimination legislation.
   - Awards and agreements.
3. **Learning Activities**
4. **Suggested Answers**

CLASS–XI
GENERAL FOUNDATION COURSE (501)
(Common for Health and Beauty Studies and Beauty Services)

(Refer to page 112)

CLASS–XII
ELECTIVE
NAIL TECHNOLOGY & RETAIL (770)
THEORY + PRACTICAL

Time: 2.5+2.5 Hours ***Marks: 50+50***

A. Nail Technology **10+**

1. **Ultra Violet Gel Nail Enhancement**
   - Prepare the service area & client for service.
   - Requirement of tools & nail cosmetics.
   - Types of Nail gel enhancements service and benefits & disadvantages.

- Deal with diseases, disorder & complications.
- Knowledge of gel nail chemicals.
- Remove artificial nails.
  - Procedure for removal of temporary tips/acrylic nail/nail wraps.
- Apply or refill artificial gel nails.
- File shapes in nails.
- Apply nail tips.
- Apply gel nail enhancement.
  - Light coloured gel nail overlays.
  - Sculptured gel nail.
  - French white free edge.
  - Refill & rebalance.
  - Pink & French white backfill with gel.
  - Adding fibre wrap to gel nails.
  - No light gel application.
- After Care advice.

2. **Apply Acrylic Nail Enhancement** **10+10**

- Prepare service area & client for service, tools & cosmetics.
- Nail care commitment & procedure.
  - Choosing the acrylic nail enhancements.
  - Acrylic nails.
  - Natural nail overlay.
  - Tips & overlay.
  - Rebalance/infill.
  - Sculptured nails.
  - Fabric wrap.
  - Temporary tips/party tips.
- Acrylic nail complications.
- Remove artificial nails (temporary tips/acrylic nails/nail wraps).
- Apply/refill artificial nails.
  - File shape & apply nail tips.
  - Apply acrylic nails & nail wraps.
- Acrylic nail overlay procedure (over tips or natural nails).
- Apply acrylic enhancement to challenging nails.
  - Bitten nails.
  - Sky jump nails.
  - Crooked nails.
  - Hook nails.
- Rebalancing.

- Two colour method (pink & white backfill).
- Acrylic crack repairs.
- Apply nail wraps.
- Apply nail wrap rebalance/refill.
- After care advice.

3. **Use Electric File Equipment for Nails** **5+10**
   - Prepare the service area & client for service.
   - Identify the benefits of electric file use.
   - Deal with nail diseases & disorders.
   - Prepare yourself & work safely.
   - Identify & practice electric file techniques.
4. **Advanced Nail Art** **5+10**
   - Prepare the service area & client for service for air brush nail art.
     - Tools & implements for air brushed nail art.
     - Cleaning & maintaining air brush.
   - Deal with nail diseases, disorders & complications.
   - Apply air brushed nail art.
     - Air brushed nail art designs techniques.
     - Create & apply advanced nail art (stencil & glitter art).
   - After care advice.
     - Respond to feedback.
     - Obtain & provide after care.
5. **Learning Activities**
6. **Suggested Answers**

B. Retailing **10+5**

1. **Merchandise Products**
   - Place and arrange merchandise.
     - Identify the customer.
     - Arrange and display merchandise.
     - Identify unsuitable stock.
     - Rotate stock.
     - Applying the seven principles merchandising.
     - Apply occupational Health & safety policy.
   - Maintain a Display.
   - Prepare Display Price Tickets and Labels.
     - Analyse Tickets.
     - Prepare Labels and Tickets.
     - Store & Maintain Ticketing Equipment.

– Identify unsuitable Tickets.

- Place, Arrange and Display price tickets & Labels.
- Place correct/Labels on merchandise.
- Replace Tickets and Labels.
- Maintain Correct Price Information.
- Protect Merchandise.
- Applying correct handling storage and display techniques.

2. **Apply Safe Working Practices** **10+5**
   - Apply procedures for basic safety in workplace Occupational Health and Safety (OHS).
   - Know your safety responsibilities.
   - Recognize hazards and unsafe work practices.
   - Take precaution to reduce risk.
   - Use safe manual handing methods.
   - Apply procedures for emergencies in the retail workplace.
   - Respond to illness and accidents.
   - Follow evacuation procedures.
   - Reporting accidents and incidents.
3. **Learning Activities**
4. **Suggested Answers**

CLASS–XII
ELECTIVE
ARTS & SCIENCE OF MAKE UP & RETAIL (771)
THEORY + PRACTICAL

Time: 2.5+2.5 Hours ***Marks: 50+50***

A. Art & Science of Make–up

1. **Design and Apply Make-up for Photography** **15+15**
   - Introduction.
   - Prepare the client.
   - Contraindications.
   - Skin type conditions & colour.
   - Clean the face & neck.
   - Identify facial shape.
   - Identify corrective make up areas.
   - Corrective techniques.
   - Determine the photographic context.
   - Colour & its importance.
   - Effects of light/direction of light.

- Make up of black and white coloured images.
- Application of makeup.
- Health & Hygiene.

2. **Design and Apply Remedial Camouflage Make-up** **15+15**
   - Introduction.
   - Prepare the client for service.
   - Study of skin.
   - Skin orders.
   - Skin order.

     Nevus & pigmentation disorder, skin condition (tattoos, varicose veins).
   - Contra indications.
   - Assessment of the treatment area.
   - Identify clean skin tone.
   - Effect of light on makeup.
   - Design the camouflage make up procedures.
   - Select the products and equipment's.
   - Procedure of camouflage make up.
   - Removal of camouflage make up.
   - Home care advise.
3. **Learning Activity**
4. **Suggested Answers**

B. Retail Make-up and Skin care **10+10**

1. **Sell Product and Services**
   - Respond to customer enquiries.
   - Product knowledge.
   - Handle customer enquiries.
   - Approach the customer.
     - Open the sale.
     - Create a good first impression when approaching to customer.
   - Determine customer needs.
   - Use communication techniques.
   - Convert feature to benefits.
   - Analyse and match customer needs.
   - Communicate product features and usage.
   - Selling benefits.
   - Respond to customer objections.
   - Identify and accept customer objections and find solutions.
   - Close the sale.

- Respond to customer buying signals.
- Use closing techniques.
- Maximize sales opportunities.
- Identify opportunities for additional sales.
- Finalize the sale.

2. **Provide Service to Client** **10+10**
   - Receive, service and schedule client.
     - Receive clients and deliver service to clients.
     - Schedule Client.
   - Responds to client complains.
     - Establish and resolve the nature of complain.
     - Future remedies.
   - Identify and respond to special needs.
3. **Learning Activities**
4. **Suggested Answers**

CLASS–XII
GENERAL FOUNDATION COURSE (501)
(Common for Health and Beauty Studies and Beauty Services)

(Refer to page 120)

LIST OF RECOMMENDED BOOKS

1. Nail Technology and Retail-II, Students Handbook, Class–XII, Published by CBSE.
2. Arts and Science of Makeup and Retail–II, Students Handbook, Class–XII, Published by CBSE.
3. Nail Technology and Retailing–I, Students Handbook, Class–XI, Published by CBSE.
4. Arts and Science of Makeup and Retail–I, Students Handbook, Class–XI, Published by CBSE.
5. Beauty Therapy: The Foundation Level II, 2ed by Lorraine Nordmann.
6. Professional Beauty Therapy Level III, 2ed by Lorraine Nordmann.
7. Milady's Standard Cosmetology, ISBN:978-1-5625-3880-2.
8. Reagents/ Prentice-Hall Textbook of Cosmetology by Mary Healy.
9. Beauty Therapy: The Foundation Level II, 2ed by Lorraine Nordmann.
10. Professional Beauty Therapy Level III, 2ed by Lorraine Nordmann.
11. Milady's Standard Cosmetology, ISBN:978-1-5625-3880-2.
12. Reagents/ Prentice- Hall Textbook of Cosmetology by Mary Healy.
13. Great Hair by Davis Biton.
14. The art of dressing long hair by Guy Kremer and Jackin Wadeson.
15. Cobella's Styling and Colouring, DVD's. Beverly C.

STANDARD LIST OF TOOLS AND EQUIPMENTS TRADE SKILL – I & II

S. No.	Trainees Personal Kit	Quantity
1.	Pack & Bleach Brush.	01 No.
2.	Nail Brush.	01 No.
3.	Head Band.	01 No.
4.	Eye Lash curler.	01 No.
5.	Manicure set.	01 No.
6.	Cuticle cutter.	01 No.
7.	Pedicure set.	01 No.
8.	Wax applicator.	01 No.
9.	Spray Bottle.	01 No.
10.	Small Bowls.	01 No.
11.	Make-up brush set.	01 No.
12.	Make-up sponge.	01 No.
13.	Artificial Eye lash set.	01 No.
14.	Black head remover.	01 No.
15.	Towels.	As per requirement
16.	Dye brush.	01 No.
17.	Gloves.	01 No.
18.	Cutting Sheet.	01 No.
19.	Hair cutting scissor.	01 No.
20.	Setting Clips.	As required
21.	Bob pins.	As required
22.	Jura pins.	As required
23.	Open teeth comb.	01 No.
24.	Styling comb.	01 No.
25.	Tail Comb.	01 No.
26.	Switch stand.	01 No.
27.	Plain switch.	01 No.
28.	Swiggle.	01 No.
29.	Plaits.	01 No.
30.	Razor comb.	01 No.
31.	Hair Accessories.	As per requirement

TOOLS & EQUIPMENTS

S. No.	Description Name	Quantity
1.	Tray.	20 No.
2.	Manicure Bowls/ Pedicure Tubs.	20 No. each
3.	Vibro Massagers.	4 No.
4.	Wax Heater with Thermostat with double bowl.	06 No.
5.	Manicure Tables with lamps.	6 No.
6.	Stools for Manicure.	20 No.
7.	Complete Facial Machine Latest.	03 No.
8.	Vapozone Electronic.	02 No.
9.	UV Sterlizer.	04 No.
10.	Facial beds.	06 No.
11.	Hot plate.	02 No.
12.	Heater.	02 No.
13.	Heat Convector.	02 No.
14.	Air Conditioner Split 2 ton with Stabilizer.	02 No. each Lab.
15.	Mirror Panel.	20 No.
16.	Saloon Chairs.	12 No.
17.	Hot Towel Cabinet.	02 No.
18.	Refrigerator.	02 No.
19.	Faculty Table Chair.	02 No.
20.	Manicure Trolley.	06 No.
21.	Facial Trolley.	06 No.
22.	Make- up colour mixing plate.	04 No.
23.	Equipment Trolley.	06 No.
24.	Professional Massager.	02 No.
25.	Muscle Stimulator.	02 No.
26.	Geyser 25kts.	02 No. each
27.	Immersion Rod 1500 wts.	04 No.
28.	Pedistation.	06 No.
29.	UV lamps 36w with timer for nails.	06 No.

S. No.	Description Name	Quantity
30.	Wash Units (Basins).	04 No.
31.	Galvanic.	02 No.
32.	Almirah.	06 No.
33.	Display Board.	06 No.
34.	Hair Rollers (small, Medium, and large).	12 dz. Each
35.	Perming Rollers (Ladder perm, star perm, chopsticks, wood perm, circle rod).	12 dz. Each
36.	Ringlette Rollers (small, Medium and large.	12 dz. Each
37.	Plain Bun.	20 No.
38.	Hair Clipper Mechanical.	12 No.
39.	Cutting Scissor.	12 No.
40.	Thinning Scissor.	12 No.
41.	Hair Dusting soft brush.	12 No.
42.	Wigs with skin parting/woven on net.	12 No.
43.	Hair extension kits (Temporary) may be purchased as required after two years.	20 No.
44.	Neck Tray.	12 No.
45.	Dye Bowl.	12 No.
46.	Colour Scale.	02 No.
47.	Crimpling Tongue.	6 No.
48.	Curling Rod.	6 No.
49.	Pedestal Hood Hair dryer.	3 No.
50.	Hand Hair Dryer Heavy duty.	12 No.
51.	Hair Clipper Electrical.	6 No.
52.	Diffuser.	6 No.
53.	Scalp Steamer electronic.	2 No.
54.	Electric roller Set (20 rollers in 3 sizes).	3 No.
55.	Shampoo station with chair.	4 No.
56.	Dummy Head on stand with slip on.	20 No.
57.	Front wash basin.	4 No.
58.	Infrared Lamp.	4 No.
59.	Sterilizing Unit Wet.	2 No.
60.	Sterilizing Unit Dry.	2 No.

S. No.	Description Name	Quantity
61.	Dressing Out chairs.	20 No.
62.	Trollies.	12 No.
63.	Student Lockers with 12 cabinets.	04 No.
64.	Saloon Chairs.	12 No.
65.	Curtains for lab.	As per requirement
66.	Back View Mirror.	12 No.
67.	Hair Curler Set.	01 No.

MEDICAL DIAGNOSTICS

Introduction

Objectives of Introducing Medical Diagnostics Course in Schools.

1. To help students understand the organization of Hospitals, Research labs, Diagnostic labs.
2. To equip students with the skills needed to work in a hospital or a diagnostics lab.
3. To impart skills to students that enables them to work in manufacturing units for diagnostic reagents.
4. To develop skills and ability to assist qualified experts in health care, diagnostics and related fields.
5. To develop ability and skill among students; to understand, analyze and assist the analytical, research and development work in drug labs and various pharmaceuticals.
6. To develop the technical skills to handle the equipment and apparatus of the lab.
7. To help students learn various analytical and investigative procedures and techniques used in medical labs and hospitals.

CLASS–XI
ELECTIVE
ANATOMY & PHYSIOLOGY (741)
THEORY

Time: 3 Hours ***Marks: 60***

Unit–1 **20**

A. Anatomy & Physiology of Human Body

- Human Body.
- Definition.
- Anatomical terms.
- Structure.
- Cell.
- Tissues.
- Glands and membranes.
- Physiology.
- Functions.
- Disorders.
- Causative Factor.
- Blood components, normal concentrations and its functions, Factors affecting the normal concentration.

B. Sensory Organs

- Eye, Ear, Nose, Tongue and Skin – Structure.
- Eye, Ear, Nose, Tongue and Skin – Functions & Disorders.

C. Skeletal System

- Human Skeleton-Identification, Classification and Functions of.

1) Bones.
2) Joints.
3) Muscles.

- Types of Muscles & their functions.
- Mechanism of contraction Difference between 3 types of muscles Electro myography & mechanical recording of muscle contraction.
- Locomotion Diseases of muscles Dystrophies.
- Enzymes – changes in different.
- Diseases of muscles.

D. Nervous System

- Brain & Spinal cord Spinal nerves – segments Meninges, Blood supply to Brain Division of nervous system.
- Nerve fibers – types, functions, injuries, impulses & velocity.

Unit–2 **20**

A. Cardiovascular System

- The Heart Chambers Blood.
- Vessels – Arteries and Veins Lymphatic, Pulmonary & systematic circulation.
- Lymphoid System – nodes and its importance.
- Chambers & Functions.
- Heart rate and the significance.
- Cardiac cycle.
- HR factors.
- ECG – Machine, Recording.
- Abnormalities – types Causative Factors Reporting & Interpretation.

B. Respiratory System

- Respiratory Organs.
- Larynx & Trachea Thoraciccage Lungs.
- Functions & Disorders.
- Respiration-Mechanism- Inspiration, Expiration Gas exchange mechanism.
- Lung surfactant–compliance.
- Lung volume and capacity Respiratory Exercises Artificial Respiration-Basis & Techniques.

Unit–3 **20**

A. Digestive System

- Digestive Organs.
- Pharynx, esophagus Stomach and Intestines Liver & Pancreas Peritoneum.
- Functions & Disorders.
- Pharynx, esophagus Stomach and Intestines Liver & Pancreas Peritoneum.

B. Endocrine System

- Glands.
- Location.
- Glands & Hormones.
- Functions & Disorders.

C. Genito Urinary System

- Genito Urinary Organs.
- Kidney, Ureter, bladder, Urethra, Catherisation Female Reproductive System Male Reproductive System.
- Functions & Disorders.
- Nephron & Kidneys.
- Filtration and formation of urine.
- Uremia – Dialysis, Artificial kidney Male & Female reproductive system Secondary sex characteristics.
- Sex hormones and their functions Spermatogenesis – Sperm count of normal morphology, mortality Menstrual cycle – Ovulation.
- Tests of Ovulation's – Pregnancy Changes in pregnancy Part urition lactation Family Planning methods.

PRACTICAL

Time: 2 Hours ***Marks: 40***

Unit–1 **20**

A. Anatomy & Physiology of Human Body

- Slides of primary tissues/cells.
- Glands & Membranes.

B. Sensory Organs

- Eye, Ear, Nose, Skin & Tongue.
- Apparatus, Examination & Investigation - Eye, Ear, Nose, Skin & Tongue.
- Colour Vision.
- Use of Stethograph.
- Parts of Sphygmomano meter.
- Stethoscope, papillary reflexes.
- Recording of Blood pressure.

C. Skeletal System

- Bones and corresponding joints.
- Muscles.
- Use of Knee hammer.

D. Nervous System

- Spinalcord & external features of Brain.
- Internal structureof Brain.

- Examination of reflexes.

Unit–2 **10**

A. Cardiovascular System

- Heart and Major blood vessels.
- Use of Treadmill, Medsprier.
- ECG machine.
- Aspiration of heart and lungs.

B. Respiratory System

- Larynx, trachea, lungs.
- Apparatus & investigations.
- Bronchoscopy.

Unit–3 **10**

A. Digestive System

- GIT & Major glands.
- Investigations.

B. Endocrine System

- Endocrine glands.
- Endoscopy.

C. Genito Urinary System

- Kidney, Urinary bladder & Urethra Male & Female reproductive system.
- Placenta.
- Investigations.

CLASS–XI
ELECTIVE
DIAGNOSTIC RADIOLOGY (742)
THEORY

Time: 3 Hours ***Marks: 60***

Unit–1: X-Ray Imaging **20**

1. **Introduction to Radiology – X Ray, Ultrasound, MRI, CT, PET, Radiographic Analysis and X-Ray Imaging**
   - Discovery of x-rays.
   - Properties - production.
   - X - rayspectrum.
   - Bremsstrah lung and characteristic x - rays- x - raytube.
   - Coolidge tube.

- Tube design.
- Line focus principle.
- Space charge effect.
- Tube cooling-modern x-ray tubes.
- Stationary anode.
- Rotating anode.
- Grid controlled x-ray tubes.
- Heel effect, off focus radiation.
- Tube insert and housing-tube rating-quality and intensity of x-rays.
- Factors in fluencing them.
- Image storing & Spot film devices.
- Radio graphic films.
- Principles of Fluoroscopy.
- Fluoroscopic screens/Tables.
- Film cassette construction & application.
- Image in tensifier construction & application/types & advantages.
- Radiographic film processing.
- Use of contrast.
- Magnification of images.

2. **Effects and Control of Scattered Radiation**

- Production & significance of scattered radiation.
- Filters & beam limiting devices.
- Grid.
- Structure & materials.
- Grid ratio.
- Types of Grids.
- Grid cassettes.
- Medical Terminology.
- Assessment.

Unit–2: Dark Room Technique **20**

1. **Film Materials**

- Introduction- Electromagnetic spectrum visible spectrum.
- Structure of the film - Spectral sensitivity, green technology, basic film types, films for specialized use.

2. **Safe Light and Storage of Films**

- Principle of operation, factors, affectings a felight performance, Storage of unprocessed film, storing, radiographs, fire hazards in film stores.

3. **Photo Chemistry**

- Theory of latent image formation.
- Introduction, the concept of development.

4. **Development**
   - Nature of development, constitution of developing solution, development, time, factors affecting the use of developer.

5. **Fixing**
   - Constitution of the fixing solution, factors affecting the use offixer, replenishment, regeneration of fixing solution, silver recovery- rinsing washing & drying.

6. **Viewing & Identification of X–Ray films**
   - Radiation Protection.
   - Hazards of radiation.
     - Time, distance & shielding concept in ration protection.
   - Shielding materials.
   - Radiation surveillance indiagnostic & the rapeutic radiation installations.
   - Regulatory board & its recommendations.
   - Radiation detectors.
   - Ion Chambers.
   - G. Mcounters.
   - Scintillation counters.
   - Assessment.

Unit–3: Patient Care & Radiological Positioning **20**

1. **Introduction to Patient Care**
   - Clinical responsibility.
   - Legal responsibility, Hospital & the radiographer.

2. **General Patient Care**
   - Patient transfer technique.
   - Turning the patient (patient conditions, Mechanic safety).
   - Restraint techniques - Trauma, Pediatric, Geriatric, Physically handicapped, disturbed patients, an aesthetized patient, moving chair & stretcher patients.
   - Specific patient conditions.
   - Tubes & catheters, Nasogastric, chest, Urinary, intravenous.
   - Oxygen & other (Cast surgical & cardiac) Alcoholic, bedpans & urinals.
   - Security of patient properties. Patient, inpatient.
   - General comfort & reassurance for the patient.
   - Assessment.

PRACTICAL

Time: 2 Hours *Marks: 40*

Unit–1: X–Ray Imaging **10**

- X–Ray Tubes.
- Stationary & Rotation Anode.
- X–ray Consolestation (Demo of KV, MA and exposure time settings).
- Procedures to reduce Scattered Radiation.
- Focus Principle.
- Grids.
- Screen.
- Image in tensifiers.
- Use of contrast materials.

Unit–2: Dark Room Technique **10**

- Images to ring devices.
- Film cassette construction.
- Duplicating a film.
- Spectrum.
- Films types - Specialized use.
- Operation, storage.
- Photo chemistry.
- Development.
- Fixing.
- Radiation protection, counters.
- Assessment.

Unit–3: Radiological Positioning **20**

- Patient transfer technique.
- Turning the patient.
- Restraint techniques - Trauma, Pediatric, Geriatric, Physically handicapped, disturbed patients, an aesthetized patient, moving chair & stretcher patients.
- Tubes & catheters, Nasogastric, chest, Urinary, intravenous, oxygen & other (Castsurgical & cardiac) Alcoholic, bed pans & urinals.
- Assessment.

CLASS–XII
ELECTIVE
LABORATORY MEDICINE–II (741)
THEORY

Time: 3 Hours *Marks: 60*

Unit–1: Investigation Urine & Faces Analysis **10**

- Introduction.
- Maintenance & Equipments of Pathology Lab.
- Preparation of Reagents.
- Urine.
- Formation and composition.
- Collection Preservation Gravity & PH.
- Examination–Physical.
- Examination– Chemical.
- Sugar.
- Ketone Bodies, Bile.
- Blood, Crystals.
- Parasites & Abnormal Cells.
- Feces–Formation, Physical & Chemical Examination.
- Preparation of stool sample for microscopic examination.
- Sputum Examination.
- Assessment.

Unit–2: Body Fluids **10**

- Body Fluids.
- Cerebro spinal fluid. Synovial fluid and Pleural fluid Pericardial fluids Peritoneal fluids.
- Other fluids collected stransudateor exudates.
- Semen Analysis–Collection, Physical & Chemical examination.
- Sperm count – Microscopic examination & Motility.
- Assessment.

Unit–3: Process & Investigations **10**

- Reagents – Preparation and their uses.
- Personnel care and protection Disposal of Bio-Medical waste Smear Making.
- Staining Methods.
- Osmotic fragility test.
- Differential Counts.
- Cellcounts – RBC, WBC, and Platelets Eosinophil & Reticulocyte count ESR.
- LE Cell.
- Haemopoeisis – Erythrocytes Hemoglobin – Estimation Packed Cell Volume, Indices Hematocrit and Red cellindices Anemia.
- Leukocytes.
- Coagulation Factors.
- Coagulation disorders – Bleeding & Clotting Time.
- Bone marrow study.
- Assessment.

Unit–4: Blood Bank & Transfusion 10

- Blood Bank.
- Material & equipment Reagents – preparation Protocols.
- Storage & Preservation.
- Records in Blood bank.
- ABO System.
- Subgroups in ABO System.
- Practical importance of Other blood groups.
- Rh System.
- Antibody titers.
- Blood grouping techniques Problems in blood grouping Donor Motivation.
- Donors election & Registration.
- Blood Collection.
- Storage, Preservation & Processing of blood.
- Quality control.
- Investigation of transfusion, reactions.
- Grouping & cross matching Direct and Indirect Coombs test Mandatory Test.
- Assessment.

Unit–5: Lab Process 10

- Materials, Equipment & Techniques.
- Biopsy, Autopsy.
- Collection, Preservation & Labeling of Slides, Blocks, Specimens.
- Techniques.
- Grossing Methods.
- Fixatives.
- Processing of the tissues including Bone.
- Embedding Section Cutting Staining & Mounting Special Stains.
- Preservation of reports & records.
- Assessment.

Unit–6: Cytology 10

- Techniques Equipment & Procedures – FNAC, Imprintssmear.
- Vaginal & Buccalsmear, Swabs.
- Staining procedure and Mounting.
- Preparation of fluids for Cytological Examination.
- Immuno histo chemistry.
- Assessment.

PRACTICAL

Time: 2 Hours *Marks: 40*

Unit–1: Urine & Feces Analysis 7

- Introduction.
- Maintenance & Equipment of Pathology Lab.
- Preparation of Reagents.
- Urine.
- Formation and composition.
- Collection Preservation Gravity & PH.
- Examination–Physical Examination - Chemical Sugar.
- Ketone Bodies.
- Bile, Blood, Crystals.
- Parasites & Abnormal Cells.
- Feces–Formation, Physical & Chemical Examination Preparation of stool sample for microscopic examination Sputum Examination.
- Assessment.

Unit–2: Body Fluids 7

- Body Fluids.
- Cerebrospinal fluid, Synovial fluid.
- Pleural fluid.
- Pericardial fluids.
- Peritoneal fluids.
- Other fluids collected stransudateor exudates.
- Semen Analysis – Collection, Physical & Chemical examination.
- Spermcount – Microscopic examination & Motility.
- Assessment.

Unit–3: Hematology Process & Investigations 7

- Smear Making Staining Methods Osmotic fragility test.
- Differential Counts.
- Cellcounts – RBC, WBC, Platelets.
- ESR.
- LE Cell.
- Hemoglobin – Estimation.
- Hematocrit and Red cellindices.
- Coagulationdis orders – Bleeding & Clotting Time.
- Bone marrow study – Demo.
- Assessment.

Unit–4: Blood Bank & Transfusion 7

- Blood Bank.
- ABO Blood grouping – cell and serum grouping.
- Rh typing.
- Anti body titers.
- Blood grouping techniques – Other methods.
- Donor selection & Registration – Demo.
- Blood Collection – Demo.
- Storage, Preservation & Processing of blood – Demo.
- Quality control Demo.
- Investigation of Transfusion, reactions.
- Cross matching.
- Direct and Indirect Coombs test.
- Mandatory Test – Screening Tests – Demo.
- Assessment.

Unit–5: Histopathology Lab Process 6

- Histopathology.
- Introduction.
- Materials, Equipment & Techniques.
- Biopsy, Autopsy.
- Collection, Preservation & Labeling of Slides.
- Blocks, Specimens Techniques.
- Grossing Methods.
- Fixatives.
- Processing of the tissues including Bone.
- Embedding.
- Section Cutting.
- Staining & Mounting.
- Special Stains.
- Preservation of reports & records.
- Assessment.

Unit–6: Cytology 6

- Cytology.
- Techniques Equipment & Procedures – FNAC.
- Imprintssmear, Vaginal & Buccalsmear, Swabs.
- Staining procedure and Mounting.
- Preparation of fluids for Cytological Examination.
- Immuno histo chemistry.

- Assessment.

CLASS–XII
ELECTIVE
CLINICAL BIOCHEMISTRY & MICROBIOLOGY–II (742)
THEORY

Time: 3 Hours ***Marks: 60***

Unit–1: Concepts Instruments & Procedures 10

- Introduction - scope of biochemistry and clinical biochemistry objectives and scheme of clinical biochemistry teaching.
- Basic Biochemistry - over view of biomolecules, biochemical transformations. Biochemical organization of cell, tissues, organs and human organism.
- Ethics and Discipline - Laboratory ethics and discipline. Patient management, Reception, Registration, Biochemical parameters investigations, protocols, documentation.
- Hazards and safety - physical, chemical and biological hazards, self & patient & equipment safety. Disposal of laboratory waste and the hazardous material.
- First Aid Measures.
- Instruments, Principles & Procedures: Basis, uses, parts, installation, glass ware & plastic ware – colorimeters, balances, centrifuges, refrigerators, hot air ovens, water baths, thermometers, vortex, mixers, magnetics stirrers, UV lamp.
- Cleaning & Maintenance of Equipment.
- Assessment.

Unit–2: Investigations Separation Procedures & Analysis 10

- Separation techniques: basic principles, different types, general techniques and clinical applications of different types of electrophoresis and chromatography.
- Automation: Basic Principles, different components and general principles of usage and applications.
- Calcium and Phosphorus: Outlines of mineral metabolism. Principles of estimation of serum calcium and inorganic phosphate and their clinical importance.
- Urine Proteins: requirements of quantisation of proteins in the urine. Different samples used Principles of samples collection, preservation and analysis.
- Lipoproteins: Principles of estimation of different lipo protein fractions of lipase, & LDH.
- Acid–Base balance.
- Immuno as says.
- Sample identification and labeling.
- Types and mechanisms of actions of various anti coagulants and preservatives used Principles of Spectrophotometry and Turbidoemetry.
- Quantitative analysis.
- Calorimetery- applications in clinical biochemistry.
- Units of measurement.
- Assessment.

Unit–3: Functional Test & Profile 10

- Glucose tolerance test: Concept of tolerance tests. Definition, patient preparation, performance, reporting and interpretation of GTT.
- Liver functions tests: bilirubin, total proteins, albumin and prothrombin time, turbidity tests and serum enzyme estimations (SGPT, ALPA and GT).
- Kidney functions tests: Concept of clearance tests, Use of serum NPN substances creatinine clearance, concentration and dilution tests and urine examination.
- Gastric function tests: Principles of analysis of gastric juice, Concept of basalandmaximal acid outputs, Principles of stimulation tests & tubeless gastric analysis.
- Thyroid function tests: Principles underlying estimations of various thyroid hormones and their interpretations.
- Profiles: Concepts of Profile testing.
- Cardiac Profiles.
- Lipid Profile.
- Assessment.

Unit–4: Fundamentals of Microbiology **10**

- Personal Care.
- Infection Control.
- Sterilization Techniques - Autoclave, Hotair oven, Tyndallization & Pasteurization.
- Equipment – Handling & Maintenance.
- Assessment.

Unit–5: Bacteriology **10**

- Bacteriology.
- Applied Anatomy and Physiology of the Bacterial Cell.
- Pathogenic organisms.
- Identification & Isolation of Staphylococcus, Streptococcus, Pneumococcus, Gonococcus, eningococcus, C. diptheria, Mycobacterium tuberculae and M. Leprae, Clostridia, E. Coli, Klebseilla, Salmonella, Shigella, Proteus, Vibrio, Pseudomonas.
- Anthrax, Plague, Dengue, Japanese encephalitis.
- Assessment.

Unit–6: Mycology Immunology & Serology Parasitology Virology **10**

- Introduction & Classification.
- Enumeration of pathogenic & opportunistic fungi.
- Introduction.
- Antigens, Antibodies & Reactions.
- Hypersensitivity.
- Introduction.
- Pathogenic parasites in blood, stool and urine.
- Viruses – Classification, Cultivation & Enumeration.
- Study of the laboratory animals – Sheep, Rabbit, Mice & Guinea Pig.
- Assessment.

PRACTICAL

Time: 2 Hours ***Marks: 40***

Unit–1: Instruments & Procedures 7

- Lab Equipment – Identification, Use & Cleaning of Glass & Plastic ware.
- Pipettes: Use of Pipettes/automated.
- Sample collection – Blood, urine and body fluids, Containers - Appropriate usage for different samples.
- Centrifuge – Preparation and separation of plasma, serum protein.
- Storage of sample.
- Filters - Filter Papers & Filtration.
- Drying of chemicals.
- Weighing – Appropriate Balances.
- Solutions – Preparation, Reagents - Preparation.
- Usage-Thermometer, Vortex Mixers & Magnetic Stirrers.
- Buffers.
- Colorimeters – Beer – Lambert's Law Experiment.
- Assessment.

Unit–2: Investigations 7

- Glucose: Orthotoluidine and glucose oxidase methods.
- Urea: DAM method and urease Berthelot reaction.
- Serum Creatinine: Jaff's method end point and kinetic analyses modes.
- Serum total proteins: Biuret method.
- Serum Albumin: Dyebinding (BCG) method.
- Serum Bilirubin.
- Malloy Evelyn method, Vandenberg reaction.
- Total andc onjugated bilirubin estimation.
- Amino transferases: AST and ALT – Reitman Frankel method.

Unit–3: Separative Procedures & Analysis 7

- Estimation of serum: sodium, potassium and Lithium by Flame.
- Photometer.
- Estimation of serum bicarbonate by titration method.
- Acid base parameters using blood gas analyzers.
- Estimation & Standardization of Glucose, Urea, Creatinine, Chloride, Proteins & Transaminases.
- Standardization of pipettes and photo metric instruments – Demo and Analysis of Gastric juice, Demonstration of stimulations tests.
- Separation Techniques.
- Electrophoresis – serum proteins, hemoglobin – Demo.

- Paper chromatographic – aminoacids and carbohydrates – Demo.
- Oral glucose tolerance test.
- Estimation of 24 Marks urine proteins by turbid metric method.
- Assessment.

Unit–4: Personal Care, Sterilization & Equipment 7

- Personal Care, Sterilization & Equipment cleaning the equipment and glass ware Universal precautions.
- Methods of Sterilization – Autoclave, Hotair oven.
- Tyndallization & Pasteurization, Filtration, Disinfection & Antiseptics.
- Sterilization of Syringes, Needles & Slides.
- Sterilization of Cultureroom & Work Benches.
- Maintenance of the Equipment – Indications & Contra – Indications for Sterilization in a equipment.
- Uses of equipment.
- Refrigerators.
- Deep Freezers.
- Incubators & Water baths Different microscopes Preparation of wire loops Preparation of Pasture pipettes Preparation of smears.
- Assessment.

Unit–5: Bacteriology 6

- Staining procedures.
- Simple, Grams, Acid fast Albert, Fontana's Negative.
- India Ink & Negrosin.
- Hanging drop preparation.
- Preparation of media, pH adjustment, Sterilization, storage and disposal after use of Solid, liquid and special media.
- Disposal of specimens and contaminated material.
- Sample collection, labeling, registering and maintenance of records and statistics.
- Processing Techniques – Sputum, Blood, Urine & Stool, Pus, CSF. Swab – Wounds, Skin, Throat, Clippings, Spore, Strips.
- Assessment.

Unit–6: Mycology Immunology & Serology Parasitology 6

- Fungi – Identification, Collection & Labeling.
- Microscopy.
- KOH preparation.
- Staining methods & Culture methods.
- Lactophenol blue.
- Negative – Indian Ink Negrosin.
- Culture, Slide Culture.

- Collection of specimen.
- Labeling, separation of Sera and Storage.
- Inactivation of serum.
- VDRL Test – qualitative and semi-qualitative & quantitative.
- Widetest – principle and procedure.
- Latex tests – R.A. factor.
- Stool examination – saline, iodine staining & Concentration.
- Preservation of samples.
- Disposal of infected material.
- Peripheral bloods mear preparation and staining techniques.
- Leishman, Giemsa's & JSB stain.
- Assessment.

LIST OF RECOMMENDED BOOKS

1. Current Medical Diagnosis and Treatment 2013 by Maxine Papadakis, Stephen J. McPhee and Michael W. Rabow.
2. Problem - Oriented Medical Diagnosis (Lippincott Manual Series (Formerly known as the Spiral anual Series) by H. Harold Friedman.
3. DSM-IV Made Easy: The Clinician's Guide to Diagnosis by James R. Morrison.
4. Bates' Guide to Physical Examination and History – Taking Point (Lippincott Williams & Wilkins) by Lynn Bickley MD.

LIST OF EQUIPMENTS REQUIRED TO IMPART TRAINING AT MEDICAL COLLEGE HOSPITAL, INSTITUTES

Minimum Requirements: (for a batch of 30 students)

A. Basic Instruments.

B. Instruments for Demonstrations.

C. Reagents & Chemicals, Glassware.

A. Basic Instruments (Approx. Cost 5 lacs)

1.	Microscope with built in illumination.	Monocular	– 6
		Binocular	– 2
2.	Calorimeter.		– 1
3.	Photoelectric colourimeter.		– 1
4.	Incubator.		– 1
5.	Hot Air Oven.		– 1
6.	Autoclave.		– 1

7.	Simple Balance.	–	1
8.	Haemoglobinometer Colormetric.	–	1
9.	Single Pan Balance.	–	1
10.	Haemocytnmeter (Hellige).	–	10
11.	Water bath (Serological).	–	2
12.	Centrifuge Machine angle rotator with wintube adoptor, time & speed regulator.	–	2
13.	Innoculation Chamber Rotary.	–	1
14.	Microtome.	–	1
15.	ELISA Reader & Washer.	–	1
16.	Distillation Plant All Glass Double.	–	1
	Single Distillation.	–	1

B. Instruments for Demonstrations (Approx. Cost 10 lacs)

1.	Haematology Analyser (semi automated).	–	1
2.	Haematology Analyser (fully automated).	–	1
3.	Biochemistry Analysers (semi automated).	–	1
4.	Biochemistry (fully automated).	–	1
5.	ELISA Reader (automated).	–	1
6.	Electrophrasis Apparatus.	–	1
7.	Histo Kinett.	–	1
8.	Densitometer.	–	1
9.	Freezing Microtome.	–	1
10.	Tissue Processor.	–	1
11.	Mclntosch Apparatus for Anaerobic Culture.	–	1
12.	Laminar flow System.	–	1

C. Reagents/Chemicals, Glass Wares

As per requirements of Diagnostic Laboratories for 40–50 samples per day.

Annexure–1

APPLICATION FORMAT FOR OFFERING VOCATIONAL SUBJECT / COURSES AT SENIOR SECONDARY LEVEL

1. **Name of the Course(s) applied for:** .....
   (with subject codes) .....
   .....
   .....
2. **Name of the School (Complete address)** .....
   (Also provide Website address if available) .....
   .....
   .....
3. **Affiliation No.** .....
4. **School ID.** .....
5. **Name of the Principal** .....
   - Phone No. .....

- Mobile No. .....
- E-mail .....

6. **Infrastructure** .....
   No. of Students .....
   No. of Teachers .....
   Student-Teacher Ratio .....
   No. of Classrooms .....
   Books in Library .....
   Total Computers in Computers Labs .....
   Specification of Computers .....
   Details of Constructed area for .....
   Establishing Laboratories .....
7. **Name of Teachers for Vocational Course** .....
   (Qualifications) .....
   .....
   .....

8. **Details of Draft** (in favour of **Secretary, CBSE,** Payable at Delhi)

   DD No.: ..... Date: ..... **Amount** (in Digits)
.....

   Bank Issues: ..... **Amount** (in Words)
.....

Signature & Seal of the Principal

Note: The document complete in all respects may be sent to: **The Director (Vocational Education), Central Board of Secondary Education 2, Community Center, Preet Vihar, New Delhi-110092.**

SENIOR SCHOOL

CURRICULUM

2016-17

VOLUME-IV
(PART-4)

Media, Entertainment and Production Based Courses

CENTRAL BOARD OF SECONDARY EDUCATION
"SHIKSHA KENDRA", 2, COMMUNITY CENTRE, PREET VIHAR, DELHI – 110 301"

MEDIA, ENTERTAINMENT AND PRODUCTION BASED COURSES

1. Fashion Design & Garment Technology
2. Textile Design
3. Design & Innovation
4. Music Technical Production
5. Mass Media Studies and Mass Media Production

FASHION DESIGN & GARMENT TECHNOLOGY

Introduction

Fashion is dynamic and ever changing. It is one of the most powerful forces in our lives. It influences every facet of our lifestyle at a particular period in time e.g. the clothes we wear, the music we listen, the food we eat, where we go for holiday or the car we drive in etc.

Fashion is a big business and key driver for several industries e.g. apparel, accessories, textiles, automobiles etc.

The purpose of the stream of Fashion Design and Garment technology under the broad head of Professional Competency Education is to tell the students about the fundamentals of fashion design and production of garments. Fashion Design as profession includes the entire process of designing and producing fashion apparels from the fibre and yarn stage to the finished product. The papers of this course will give an overview of fashion design and elaborate on different aspects like elements of design, history of fashion, fabrics, and understanding of the body, pattern development and garment construction.

Employment Opportunities

(a) As beginner assistants to designers of apparel.

(b) As coordinators for sampling houses of apparel.

(c) As liaison officers between production and merchandising departments of any export/ retail set-up in the field of apparel.

(d) As assistants in product development department.

(e) The Programme will helps students setup boutiques and small scale manufacturing setups.

Objectives of the Course

The main objective of the course is to develop professional competency and employable skills in the fields of Design (apparel) and technology (garment related).

The specific objectives are

- To develop and initialize a design vocabulary, an essential tool for practicing as designers.
- To introduce the students to garment making.
- To understand the fashion business.
- To gain knowledge of the working and interrelationships of different industries and services that comprise fashion business.
- To introduce students to the world of fashion designing through pattern development.
- To develop employable skills in designing of apparel.
- To develop employable skills in assembly of garments.
- To develop employable skills in the field of export of apparel.

SCHEME OF STUDIES
FASHION DESIGN AND GARMENT TECHNOLOGY

CLASS–XI

1	2	3			4				5
S. No.	Subject	Period/Week			Examination				Total Marks
		Th.	Pr.	Total	Marks (Th.)	Hrs.	Marks (Pr.)	Hrs.	
1.	Introduction to Fashion Industry.	3	4	7	50	2.5	50	2.5	100
2.	Elements of Design & Fashion.	3	4	7	50	2.5	50	2.5	100
3.	Garment Construction.	3	4	7	50	2.5	50	2.5	100

CLASS–XII

1	2	3			4				5
S. No.	Subject	Period/Week			Examination				Total Marks
		Th.	Pr.	Total	Marks (Th)	Hrs.	Marks (Pr)	Hrs.	
1.	Fabric Study.	3	4	7	50	2.5	50	2.5	100
2.	Basic Pattern Development.	3	4	7	50	2.5	50	2.5	100
3.	Garment Construction.	3	4	7	50	2.5	50	2.5	100

CLASS–XI
ELECTIVE
INTRODUCTION TO FASHION INDUSTRY (775)

Objective of the Course

- To learn appropriate fashion terminology.
- To understand the fashion business.
- To gain knowledge of the working and interrelationships of different industries and services that comprise fashion business.
- To differentiate and appreciate the nuances of fashion terminology.
- To provide a comprehensive exposure to the structure and functioning of the global fashion industry.
- To introduce geographical and regional cultural variations in the global apparel and life style goods industry.

Learning Outcome

After finishing the course, the students shall be able.

- To use appropriate terminology used in fashion world.
- To understand the interrelationships in fashion business.
- To get the overview of different facets of Fashion Industry.

- To understand Fashion product categorization.

THEORY

Time: 2.5 Hours ***Marks: 50***

Chapter–1: Introduction and Understanding of Fashion Technologies — 12

1.1 Fashion – An overview & Definitions in Different Aspects.
1.2 Fashion Categorization.
1.3 Fashion Dimensions.
1.4 Differentiation Between Style and Fashion.
1.5 Trend - Definitions and Origin.
1.6 Linkage and Difference Between Fashion, Design, Art and Craft.

Chapter–2: Raw Materials of the Fashion Industry — 5

2.1 Fiber.
2.2 Yarn Classification.
2.3 Fabric Development.
2.4 Dyeing.
2.5 Printing.
2.6 Finishing Processes.
2.7 Textile Industry – Today.
2.8 Transformation of Fabric into Garment.

Chapter–3: Aspects of Fashion Business — 12

3.1 Apparel Sectors – An overview.
3.2 Export House.
3.3 Retail House/Retailer.
3.4 Buying House and its Role.
3.5 Apparel Manufacturing – An Overview.
3.6 Understanding the Role of Fashion Professionals Design, Stylist and Merchandiser.

Chapter–4: Categories of Products in Fashion — 6

4.1 Introduction to the Fashion Industry.
4.2 Home Fashion Products.
4.3 Apparel Product Category.
4.4 Leather Product Category.

Chapter–5: Global Trade of Fashion Industry — 11

5.1 Glamour of Fashion – An Overview.
5.2 Influential Designers of the Early Twentieth Century.
5.3 Designers with Indelible Identity.
5.4 Designers in India.
5.5 Business of Fashion – An Overview.

5.6 Brands: India and Abroad.

5.7 Role of Media in Glamorizing Fashion.

5.8 Trade Show.

Chapter–6: The Organizations and Associations in the Fashion Industry **4**

6.1 Introduction to the Handloom and Handicraft Sector.

6.2 Non-Governmental Organization.

6.3 Government Organization.

6.4 The Textile Testing Laboratories.

6.5 Fashion Week Organizers.

6.6 Fashion Institutes and Colleges in India.

PRACTICAL

Time: 2.5 Hours ***Marks: 50***

Practical No. 1: **3**

- To observe and appreciate the uniqueness of a craft.

Practical No. 2: **2**

- To observe, appreciate and explore the fashion trends demonstrated by surroundings in the current time.

Practical No. 3: **3**

- To observe and appreciate the classic silhouettes those have retained their identity through time.

Practical No. 4: **4**

- To creatively explore variations in forms and shapes from different mediums to generate prints from unusual inspirational sources.

Practical No. 5: **4**

- To creatively explore the patterns created by using dying process.

Practical No. 6: **4**

- To explore the print development through the surface structures of various products.

Practical No. 7: **4**

- To understand the stencil printing technique.

Practical No. 8: **2**

- To observe, appreciate and explore the fashion trends demonstrated by society in the current time.

Practical No. 9: **2**

- To observe, appreciate and explore the fashion trends demonstrated by Indian Consumer in Indian ethnic wear category.

Practical No. 10: **2**

- To observe and understand the effect of costumes in films on the society.

Practical No. 11: **2**

- To observe, appreciate and explore the fashion trends demonstrated by Indian Consumer in menswear casual clothing.

Practical No. 12: **2**

- To observe and understand the product category in home fashion line.

Practical No. 13: **2**

- To observe and understand the product category in leather.

Practical No. 14: **2**

- To observe and appreciate the uniqueness of product detail created by listed designers.

Practical No. 15: **2**

- To introduce students to various national and international apparel brands.

Practical No. 16: **2**

- To introduce students to various national design and fashion institutes/colleges.

Practical No. 17: **2**

- To understand the design path followed by an established designer.

Practical No. 18: **2**

- To introduce students to various kids wear brands.

Practical No. 19: **2**

- To observe, appreciate and explore the fashion trends demonstrated by society in the current time.

Practical No. 20: **2**

- To introduce students to the roles played by an NGO in our society.

Recommended – Full day Practical

- Survey a Department of Lifestyle store and study the products on display. Make a presentation incorporating the following information – Range of products, clientele, price range, and visual display.
- Visits to at least three support institutes and study of their working- report on the same.
- Presentation on study on designer/design house/brand/store.

Methodology of Teaching

- Illustrated lectures with slides and visuals.
- Presentations.
- Market survey and research.

Evaluation Criteria

- Theory – Written Exam for 50 marks (2.5 hours).
- Practical – 50 marks – 30 marks viva file with practical projects to be created with 10 marks internal and 10 marks external faculty.

Prescribed Reference Text

- Introduction to Fashion Industry Handbook + Practical Manual, Class–XI, Published by CBSE.
- Concept to consumer - Gini Stephens Frings.
- Inside Fashion Business - Jeanette A. Jarrow, Miriam Guerriro, Beatrice Judelle.
- Fashion Kaleidoscope - Meher Castellino.
- Fashion accessories - Glenco McMillan/ Mc Graw.
- McDowell, Colin, Shoes- Fashion and Fantasy, Thames and Hudson.

CLASS–XI
ELECTIVE
GARMENT CONSTRUCTION (776)

Objective of the Course

- To introduce the students to garment making.
- To familiarize them with sewing machine & its parts.
- To familiarize them with use of other sewing aids.
- To teach them basic hand and machine stitches.
- To teach them simple machine operations.

Learning Outcome

After finishing the course, the students shall be able.

- To work proficiently on the sewing machine.
- To rectify simple problems of the machine.
- To stitch different seams on the machine.
- To finish edges with hand stitches.
- To make gathers, pleats and tucks on the fabric.

THEORY

Time: 2.5 Hours ***Marks: 50***

Chapter–1: 10

- Introduction to sewing machine, its various parts.
- Functions of various sewing machine parts.
- Types of sewing machines.

Chapter–2: 5

- Sewing aids.

Chapter–3: 10

- Maintenance of sewing machine.
- Understanding the simple problems of sewing machine and the solutions.

Chapter–4: 10

- Selection of suitable needle and thread for various fabrics and suitable stitch per inch (SPI).

Chapter–5: **15**

- Seams and Seam finishes.

PRACTICAL

Time: 2.5 Hours ***Marks: 50***

Practical No. 1: **4**

- Develop Proficiency in use of Sewing Machines.

Practical No. 2: **4**

- Stitching on Paper.

Practical No. 3: **4**

- Basic Stitching Skills.

Practical No. 4: **4**

- Develop Proficiency in Straight, Angular and Curved Seams.

Practical No. 5: **4**

- Basic Hand Stitches.

Practical No. 6: **4**

- Permanent Stitches.

Practical No. 7: **4**

- Basic Machine Seams.

Practical No. 8: **4**

- Fabric Manipulation: Darts.

Practical No. 9: **5**

- Fabric Manipulation: Tucks - Plain Tucks.

Practical No. 10: **5**

- Fabric Manipulation: Pleats.

Practical No. 11: **4**

- Fabric Manipulation Gathers.

Practical No. 12: **4**

- Fabric Manipulation: Shirring.

Methodology of Teaching

- Illustrated lectures with slides, visuals and demonstrations wherever required.

Evaluation Criteria

- Theory – Written Exam for 50 marks- 2.5 hour.
- Practical – 50 marks- Exam for 30 marks, File work to be marked 10 marks external and 5 marks internal faculty, 5 marks viva.

Prescribed Reference Text

- Garment Construction Handbook & Practical Manual, Class XI, Published by CBSE.
- Encyclopedia of Dressmaking by Marshall Cavendish.
- Readers Digest book of Sewing.
- Encyclopedia of Sewing.

CLASS–XI
OPTIONAL
ELEMENTS OF DESIGN & FASHION (774)

Objective of the Course

- To introduce the students to the basic elements of design.
- To increase and build sensitivity to the forms around them.
- To develop and initialize a design vocabulary, an essential tool for practicing as designers.
- To introduce to the students the rudiments of sketching – perspective, shading, sizing etc.
- To introduce the students to the sketching of the human form.
- To introduce students to the basic elements of fashion.
- To teach students about movement of fashion, fashion cycle, categories of clothing etc.
- To sensitize students about different items of garments in each category i.e. menswear, womenswear and childrenswear.
- To teach students the difference between high fashion and mass fashion.
- To distinguish between custom made & ready to wear.

Learning Outcome

After finishing the course, the students shall be able.

- Demonstrate elementary knowledge of elements of design/fashion, its origin and components.
- To use their developed ability to observe finer details around them.
- To develop basic design language.
- To understand the elements of fashion.
- To be aware of movement of fashion.
- To understand the fashion cycle.
- To know the various categories of menswear, womenswear and childrenswear.
- To understand the difference between hi-fashion & mass fashion and custom made & ready to wear.

THEORY

Time: 2.5 Hours ***Marks: 50***

Chapter–1: Introduction to Design — 10

- Understand the concept of design.
- Elements of design.
- Principles of Design.
- Textures, Shapes & forms.
- Colour – theories etc.

Chapter–2: History of Fashion — 15

- Origin of Fashion.
- Theories of clothing – adornment, protection, identification and ritualistic.
- Concept of fashion.
  - (a) Body decoration, painting, scarification.
  - (b) Draping – Greco, Roman, Indian and other continents.
  - (c) Stitched garments- war uniforms, amours inspired.
  - d) Comparison of western and oriental war uniforms.

Chapter–3: History of Modern Clothing — 15

- Influence of world wars on fashion.
- Influence of industrial revolution - custom made, mass produced.
- Automation and the various technical and scientific developments shaping the finest classless society in many centuries.
- Evolution of Indian fashion in the last century.

Chapter–4: Fashion Market Dynamics — 10

- Various categories of menswear, womenswear and childrenswear.
- Menswear – shirts, trousers, formal jackets suit and sporty suit.
- Womenswear – dresses, blouses, skirts, trousers, kameezes, saris, & blouses.
- Kids wear – categories of children for 0-15 years and various garments like frocks, skirts, blouses, trousers, dungarees, jackets etc.
- Age group relationship to design.

PRACTICAL

Time: 2.5 Hours ***Marks: 50***

Unit–1 : Introduction to Design — 15

- Colour wheel.
- Achromatic and monochromatic colour schemes.
- Textures.
- Placement of style-lines on a croquet.
- Fashion poses and properties.

Unit–2 : History of Fashion — 10

- Identifying Zeitgeist.
- Influence of iconic personalities on fashion.
- Body adornments as identification.
- Draped garments.
- Museums as a source of knowledge.

Unit–3 : Evolution of Modern Fashion 10

- Impact of Industrial Revolution.
- Influence of war costumes on contemporary clothing.
- Identification of signature styles of designer.
- Historical costumes as inspiration for traditional Indian clothing.
- Moves as s source of historical reference costume.

Unit–4 : Fashion Market Dynamics 15

- Print media as source of trend information.
- Fashion Cycle.
- Field visit to understand trends.
- Pendulum Swing as a component of fashion forecasting.
- Art, Craft Design.

Methodology of Teaching

- Illustrated lectures with slides and visuals.
- Demonstrations and individual feedback in practical.

Evaluation Criteria

- Theory – Written Exam for 50 marks- 2.5 hour.
- Practical – 50 marks- Exam for 30 marks, File work to be marked 10 marks external and 5 marks internal faculty, 5 marks viva.

Prescribed Reference Text

- Elements of Design and Fashion, Handbook & Practical Manual, Class–XI, Published by CBSE.
- 'Grafix' by Wolfganghageney.
- Repeat pattern - Peter Phillips, Gillian Bunce.
- Design Elements 2 - Richard Hora.
- Kaleidoscope of fashion, by Meher Castilino.
- Ancient Indian Costume, by Roshan Alkazi.
- Concept to Consumer, by Gini Stephens Frings.
- Encyclopedia of Fashion details.

CLASS–XI
GENERAL FOUNDATION COURSE (501)

Time: 3 Hours *Marks: 100*

Part–I: (Compulsory to all Vocational Courses) *Marks: 50*

A. Business Management and Entrepreneurship 30

(a) **Entrepreneurship Orientation** **5**
Importance and relevance in real life: Emphasis on self employment.

(b) **Entrepreneurship Values and Attitudes** **5**
Innovativeness, Independence, Risk Taking, Analytical ability.

(c) **Entrepreneurial Motivation** **5**
Achievement Planning, personal efficacy, entrepreneurial goal setting.

(d) **Launching of a Business Venture** **15**
Identification of project, steps in setting up a business, information about various institutions providing assistance, project formulation.

B. Computational Skills 10

(a) Percentage, ratio & proportion, profit & loss, discount, simple and compound interest, population growth and depreciation of value of articles using logarithm. **6**

(b) Area and volume: rectangle, parallelogram, circle, cube, cone, cylinder & sphere. **4**

C. Environmental Education 5

(a) Environment and the society.

(b) Environment properties risks in different economic enterprises, in use of raw materials, in processing / manufacturing and designing.

(c) Poverty and environment.

D. Rural Development 5

(a) Agriculture, the back bone of Indian Economy.

(b) Rural development projects in India including Integrated rural development programme.

(c) Agro based rural industries.

(d) Community approach to rural development.

Part–II *Marks: 50*

I. Study of traditional textiles of India, with special reference to their use in dress and costume. Study of designs (motifs and their arrangements), colours, fibre content, method of producing and the effect of history on the following textiles:

1. Embroidered Textiles of different parts of the country - Kashmir, Punjab, Himachal Pradesh, Rajasthan, Uttar Pradesh, Bihar, Bengal, Orissa, Gujrat and Karnataka. **15**

2. Woven textiles. **10**

   Shawls of Kashmir, Jamdani and Baluchari of Bengal, Brocades of Banaras, Pathanis, Amru, Himru, Tanchoi, Weaving in North Eastern States.

3. Tie and Dye and Ikat Textiles. **5**

   Bhandhanis of Gujarat, Rajasthan and South India, Patolas of Gujarat, Ikat Fabrics of Orisssa and Andhra Pradesh, Mashru Fabrics.

4. Printed and Painted Textiles. **10**

   Printed Textiles of Rajasthan (Sanganer and Bagru), printed and painted textiles of Andhra Pradesh Kalamkari, Pichhwaris and Mutano Pacchadi, printed textiles of Gujarat, Sanganeri prints, Ajrakh.

II. Visit to Museums and preparation of a catalogue of design of each of the special textiles. **10**

CLASS–XII
ELECTIVE
BASIC PATTERN DEVELOPMENT (775)

Objective of the Course

- To introduce students to the world of fashion designing through pattern development.
- To explain important skill that enable the designer to convert a design sketch into a three dimensional form.
- To develop basic blocks for bodice, sleeve and Indian garments.
- To understand and implement the concept of test fits and to convert paper patterns into muslin.

Learning Outcome

After finishing the course, the students shall be able.

- To understand the basic skill of pattern making.
- To understand and appreciate the concept of fit and balance.
- To develop basic blocks from measurement charts.
- To test fit the pattern.
- To develop patterns for simple designs using basic blocks.

THEORY

Time: 2.5 Hours ***Marks: 50***

Chapter–1: Introduction to Pattern Making **10**

- Understanding of body & its measurements.
- Methods of measuring body and dress form.

Chapter–2: Methods of Measuring **10**

- Relationships of sizes and measurements.
- Measurement charts.

Chapter–3: Tools and Terminology of Pattern Making **5**

- Tools of pattern making.
- Common terms used in pattern development.

Chapter–4: Garment Details **5**

- Garment details – Neckline/collar/sleeve/pocket/placket.

Chapter–5: Pattern Making of Indian Garment **5**

- Introduction to Indian Garments.

Chapter–6: Pattern Development from Drapes and Measurement **5**

- Difference of pattern from drape and measurements.

Chapter–7: Garment Fit **10**

- Introduction to Pattern Development for women wear - how patterns are made and developed, the importance of fit and balance and methods of achieving it.

PRACTICAL

Time: 2.5 Hours ***Marks: 50***

Practical No. 1: **3**

- Basic Bodice.

Practical No. 2: **3**

- Dart Manipulation.

Practical No. 3: **4**

- Salwar.

Practical No. 4: **4**

- Churidar Pyjamas.

Practical No. 5: **4**

- Saree Blouse.

Practical No. 6: **3**

- Sleeveless Saree Blouse.

Practical No. 7: **3**

- Choli Blouse.

Practical No. 8: **3**

- Necklines.

Practical No. 9: **4**

- Kameez.

Practical No. 10: **3**

- A-line Kameez.

Practical No. 11: **4**

- Kalidar Kurta.

Practical No. 12: **4**

- Two Kali Kurta.

Practical No. 13: **4**

- Sleeve.

Practical No. 14: **4**

- Collar.

Final Product

Student will learn to develop patterns for Indian garments like salwar kameez, churidar-kalidar kurta, sari blouse and choli blouse also using basic blocks develop patterns for simple designs of skirts and blouses.

Evaluation Criteria

- Theory – Written Exam for 50 marks- 2.5 hour paper.
- Practical – 50 marks- Exam for 30 marks, File work to be marked 5 marks external and 5 marks internal faculty, 10 marks viva.

Prescribed Reference Text

- Basic Pattern Development, Students Handbook & Practical, Class XII, Published by CBSE.
- Essentials of Textile by Marjorie Joseph.

CLASS–XII
ELECTIVE
GARMENT CONSTRUCTION (776)

Objective of the Course

- To assemble a garment.
- To construct a bodice using different seams.
- To make a placket for bodice opening.
- To finish a neckline by both piping and facing and attaching a collar.
- To set in a sleeve in the arm hole and finish by attaching the cuff.
- To put gathers or pleats in the skirt and finish the waist with a waist band or attach a bodice.
- To stitch Indian garments using appropriate seams and finishes.

Learning Outcome

After finishing the course, the students shall be able.

- To join various parts of the garment and construct a complete garment.
- To finish a bodice with neckline & Armhole using both piping and facing.
- To set in the sleeve.
- To stitch a skirt.
- To stitch a salwar.
- To stitch a Churidar.
- To stitch a kameez.
- To stitch a kalidar kurta.
- To stitch a sari blouse.
- To stitch a choli blouse.

THEORY

Time: 2.5 Hours ***Marks: 50***

- Garment Assembly systems. **20**

- Garment finishing machines (button hole/button attach, bartack etc. **15**
- Fabric consumptions and estimations. **15**

PRACTICAL

Time: 2.5 Hours ***Marks: 50***

- Concept of placket, various kind of plackets – continuous, diamond, shirt placket with facing, pleated shirt placket, blouse placket, kurta placket. **3**
- Concept of slit and seam. **3**
- Concept of collar and Collar attachment - peter pan, Chinese, shirt. **3**
- Pocket – Application of pocket, patch pocket, inserted pocket, structured pocket, bound pocket, welt pocket, inseam pockets etc. **3**
- Assembling of bodice. **4**
- Yoke attachment. **3**
- Sleeve attachment. **3**
- Waist band attachment. **3**
- Constructing a skirt and blouse using pattern template. **5**
- Constructing a salwar-kameez. **5**
- Constructing a Churidar-kalidar kurta. **5**
- Constructing a Sari blouse. **5**
- Constructing a choli blouse. **5**

Methodology of Teaching

- Illustrated lectures with slides, visuals and demonstrations where ever required.

Evaluation Criteria

- Theory – Written Exam for 50 marks- 2.5 hour paper.
- Practical – 50 marks- Exam for 30 marks, File work to be marked 10 marks external and 10 marks internal faculty.

Prescribed Reference Text

- Garment Construction, Handbook & Practical Manual, Class–XI & XII, Published by CBSE.
- Encyclopaedia of dressmaking by Marshall Cave.
- Readers Digest book of Sewing.
- Encyclopaedia of Sewing.

CLASS–XII
OPTIONAL
FABRIC STUDY (774)

Objective of the Course

- To acquire an elementary understanding of fibres.
- To understand yarns and fabric structures along with their end uses.

- To develop understanding of basic techniques of value addition.
- To learn appropriate surface design of fabrics.

Learning Outcome

After finishing the course, the students shall be able.

- To use appropriate terminology used in fabrics.
- To understand the various techniques of fabric structure.
- To appreciate the traditional textiles of India.
- To be able to develop basic surfaces on textiles through embroideries and dyeing techniques.

THEORY

Time: 2.5 Hours ***Marks: 50***

- Introduction to fibre and yarn - definition, terminologies, properties, end users. **10**
- Fabric structures- woven, knitted, non wovens - definition, terminologies, properties. **10**
- End users of fabrics- Fabrics for apparel, home furnishing, special purposes. **5**
- Surface value addition on textiles- Embroidery techniques, printing, resist dyeing techniques- Tie and Dye, Batik, Block Printing, Stencil Printing. **10**
- Traditional textiles of India – Embroideries of states of India. **5**
- Traditional textiles of India – Resist dye techniques in traditional Indian textiles. **10**

PRACTICAL

Time: 2.5 Hours ***Marks: 50***

Practical No. 1: **5**

- Fiber, Yarn and Fabric.

Practical No. 2: **7**

- Basic Embroidery Stitches.

Practical No. 3: **7**

- Tie and Dye.

Practical No. 4: **7**

- Batik.

Practical No. 5: **7**

- Block Printing.

Practical No. 6: **7**

- Stencil Printing.

Practical No. 7: **10**

- Indian Traditional Embroideries.

Methodology of Teaching

- Lectures, Practical, Demonstrations.
- Industry/field visits to craft centres, embroidery/tie-dye units.

Evaluation Criteria

- Theory – Written Exam for 50 marks - 2.5 hour.
- Practical – 50 marks- Exam and documentation for 20 marks (2.5 hrs), File work to be marked 5 marks external and 5 marks internal faculty.

Prescribed Reference Text

- Fabric Study, Students Handbook and Practical Manual, Class XII, Published by CBSE.
- 'Textiles' by Sara Kadolph & Anna Langford.
- Essentials of Textiles, by Marjorie Joseph.

CLASS–XII
GENERAL FOUNDATION COURSE (501)

Time: 3 Hours ***Marks: 100***

Part–I: (Compulsory to all Vocational Courses) *Marks: 50*

A. Business Management and Entrepreneurship 30

Management of Business

Elementary treatment/exposure to basic conceptual frame work of the topic listed below:

(a)= Basic Function. **6**

(b) Marketing Management. **6**

(c) Financial Management. **6**

(d) Production Management. **6**

(e) Personnel Management. **6**

B. Computational Skills 10

1. (a) Solution of linear equations and their application to problem of commercial mathematics. **5**

   (b) System of linear equations and in equation in two variables. Applications in formation of simple linear programming problems.

2. Statistics: Raw data, bar charts and Histogram; Frequency Tables; Frequency Polygon; Ogive; Menu, Median and Mode of ungrouped and grouped data; Standard Deviation; Introduction to Mortality tables; Price Index etc. Introduction to Computers. **5**

C. Environmental Education & Rural Development 10

1. **Environmental Education** **5**

   (a) Modernisation of agriculture and environment, irrigation, water logging, use of fertilisers, pesticides, soil erosion, land degradation (desertification and deforestation), silting and drying of water resources.

   (b) Rational utilisation, conservation and regeneration of environmental resources (soil, air, water, plant, energy, minerals).

2. **Rural Development** **5**

Principles and goals of rural development, major problems/constraints in rural development in India.

Part-II

Marks: 50

1. Origin of clothing - theories of origin of clothing - protection, modesty and adornment. **5**
2. Study the costume of early civilisations - Egypt, Greek and Rome, their dress, hair-style, jewellery, cosmetics and accessories. **5**
3. Study the ancient Indian costume. **10**
   - Indus Valley civilisation and Vedic period.
   - Post Vedic period.
   - Mauryan and Sunga period.
   - Satavahana period.
   - Kushan period.
   - Gupta period.

   With respect to dress including, royal, religious and military dress, headgear, hairstyle and jewellery, textiles and colours and the effect of important people and events.
4. Study the costume during medieval India. **10**
   - Sultanate.
   - Mughal period.
5. Study the modern Indian styles for dress. **10**
6. Visits to museums and art galleries and preparation of a catalogue of materials under study. **10**

LIST OF EQUIPMENTS AND SOFTWARE

Lab Requirement for 30 Students

	Desirable	**Minimum/Maximum**
Batch Size	**30**	**20/35**
Lab size -		35 ft x 20 ft.
AC environment	**Yes**	
Industrial sewing machines with power (costs at least Rs. 4,500 each)	30	One per student
Pattern Making tables (size 5 ft x 4 ft cork top)	8	4 students/table
Dress forms (half) (costs Rs. 8000 each)	30	one for 2 students
Steam irons @ Rs.1000	4	2
Ironing boards @ Rs. 500/-	4	2
Soft boards	All around the walls	2 in each lab/class
Stools	30	One per student
White board	1	1
Black board	1	1

Approximate cost will be Rs. 5,00,000/-

Selection Criteria of School

They should have ability to provide appropriate environment, well lit and ventilated space, equipment, machinery and maintenance, trained faculty, exclusive library for the course, willingness to upgrade facility and faculty.

TEXTILE DESIGN

CLASS–XI

1	2	3			4				5
S. No.	Subject	Period/Week			Examination				Total Marks
		Th.	Pr.	Total	Marks (Th.)	Hrs.	Marks (Pr.)	Hrs.	
1.	Element of Textile Design	4	3	7	50	2.5	50	2.5	100
2.	Textile Science	4	3	7	50	2.5	50	2.5	100
3.	Woven Textiles	3	4	7	50	2.5	50	2.5	100

CLASS–XII

1	2	3			4				5
S. No.	Subject	Period/Week			Examination				Total Marks
		Th.	Pr.	Total	Marks (Th.)	Hrs.	Marks (Pr.)	Hrs.	
1.	Printed Textile	3	4	7	50	2.5	50	2.5	100
2.	Traditional Indian Textile	4	3	7	50	2.5	50	2.5	100
3.	Textile Chemical Processing	3	4	7	50	2.5	50	2.5	100

CLASS–XI
ELECTIVE
ELEMENT OF TEXTILE DESIGN (777)

Objectives of Units

Introduction

Textile design involves a complete vision of development of new design aspects for novelty in fabric surface, textile products and various other textile materials. It includes designing of fabric used in clothing, house hold textiles, decorative textiles and others. It involves design intervention along with the development of the final product within the technical specification and right commercial value.

In order to create innovative surfaces and structures, “Elements of design” course is introduced as an elementary course. The course will provide an overview of Textile Design, Designer and Textile Industry. The overall objective of this course is to understand the basics of design in relation with textiles, textile design and related terminology and the overall work pattern of textile industry.

THEORY

Time: 2.5 Hours ***Marks: 50***

Unit–1: Introduction to Textile Industry **15**

Objectives

- To understand the historical background of textiles.
- To get an overview of the textile industry and related industries.
- To get familiar with various textile materials and processes.
- To gain knowledge about textile design as a field.
- To understand the textile design as a profession and the role of Textile designers in Textile and Fashion Industry.
- To understand the work structure, timing and planning in Textile industry.
- To develop knowledge of forecast and market trends, its importance and need in Textile industry.

Learning Outcome

After finishing the course students shall be able.

- To understand the overview of Textile industry including history and current industry scenario.
- To learn about the terminology associated with textile design material, process etc.
- To understand the importance of market and trends and enhance observational skills.
- To understand the Textile industry functional aspects and roles and responsibilities of a designer.

Course Content

- An Overview of Textiles, history and industrial background.
- Textile designer role responsibilities.
- Textile material and process.
- Textile industry work structure, time and planning.
- Importance of market trend and forecast.

Teaching Methodology

- Class lectures and Practical demonstrations.
- Class-room quiz.
- Presentations and Discussions in class.
- Review and Feedback on assignments.
- Market visit, Survey and Field visits to relevant Textile Manufacturing unit, museums etc.

Evaluation Criteria

- Written theory test: knowledge and understanding.
- Discussion and quiz: understanding.

Unit–2: The Primary Components of Textile Design 7

Objectives

The main objective of this unit is to develop an understanding of the primary components of textile design, and the related process. The basic of textile design knowledge is essential and useful for further application in various sectors of textile design.

- To develop an understanding for the components of textile design, and the related process.
- To introduce the students to the basic principle and elements of design.

- To develop interesting compositions using forms and colour.
- To develop sensitivity among the students for better understanding of forms and its application for creating visual images of great value.

Learning Outcome

After finishing the course students shall be able.

- To understand the application of design elements and principles for textile designing.
- To get familiar with the design process and to make design ideas using innovative material and techniques.
- To enable students to work on various design compositions.

Course Content

- Elements of design.
- Principles of design.

Teaching Methodology

- Class lectures and practical demonstrations.
- Class-room assignments to create designs for specific textile product. Display, presentations and discussions in class.
- Review and feedback on assignments.
- Market visit, survey.
- Visits to design houses (if possible).
- Special lectures and presentations by textile professionals.

Evaluation Criteria

- Written theory test: knowledge and understanding.
- Practical assignments: application and skills.
- Design assignments: innovation in design ideas, creativity and functionality.
- Display and presentation: neatness and visual impact.

Unit–3: Textile Design Development 6

Objectives

The main objective of this unit is to develop an understanding of the components of textile design through a complete process for creation of textile design patterns, repeats, various layouts, use of colors, creation of color ways for generating variety and the inspiration of design.

- To develop an understanding for the components of textile design, and the related process.
- To enable the students to utilize the principals and elements of design in application of textile design development.
- To develop interesting compositions using forms and colour.
- To develop sensitivity among the students for a wholesome understanding of the textile design process.
- Developing sensitivity to take various inspirations for development of design.

Learning Outcome

After finishing the course students shall be able.

- To understand the application of design elements and principles for textile designing.
- To get familiar with the design process and to make design ideas using innovative material and techniques.
- To enable students to work on various design compositions, repeats, layouts and color ways.

Course Content

1. Elements of textile design such as repeats, layouts and colour ways.
2. Inspiration for design and design process.

Teaching Methodology

- Class lectures and practical demonstrations.
- Class-room assignments to create designs for specific textile product.
- Display, presentations and discussions in class.
- Review and feedback on assignments.
- Market visit, Survey and field visits to Textile stores.
- Visits to design houses (if possible).
- Special lectures and presentations by textile professionals.

Evaluation Criteria

- Written theory test: understanding.
- Practical assignments: application and skills.
- Design assignments: innovation in design ideas, creativity and functionality.
- Display and presentation: neatness and visual impact.

Unit–4: Design for Various Types of Textile 22

Objectives

The main objective of this unit is to get an overview of the various types of textiles available in industry. It includes study of knits, woven, printed, embellished and resist textiles. This unit diversifies textiles through explaining various techniques and technology in textiles. The aim is also to understand the professional aspects of the work standards and methods existing in textile industry at present.

- To develop an understanding for the variety available in textiles.
- To enable the students to gain the knowledge of various techniques and methods of creating various types of textiles.
- To develop understanding of textile terminology.
- To develop understanding of professional aspects of the work practices existing in textile industry in current scenario.
- Developing textile technique skills through practical application.
- Developing communication skills and ability to use right terminology for an effective Design presentation.

Learning Outcome

After finishing the course students shall be able.

- To understand the application of various techniques available in textile industry.

- To be able to differentiate among various textiles by looking at technique of making and design aspects.
- To enable students to realize professional aspects of the work standards in textile industry at present.
- To be able to make an effective design presentation.

Course Content

1. Types of various available Textiles by techniques.
2. Presentation of Design and Professional Practices.

Teaching Methodology

- Class lectures and practical demonstrations.
- Class-room assignments to create designs for specific textile product using specific techniques.
- Display, presentations and discussions in class.
- Review and feedback on assignments.
- Market visit, Survey and field visits to nearby Textile manufacturing units.
- Visits to design houses (if possible).
- Special lectures and presentations by textile professionals.

Evaluation Criteria

- Written theory test: understanding.
- Practical assignments: application and skills.
- Design assignments: innovation in design ideas, creativity and functionality.
- Display and presentation: neatness and visual impact.

PRACTICAL

Time: 2.5 Hours ***Marks: 50***

Practical No. 1: **5**

- Understanding textiles from various perspectives.

Practical No. 2: **5**

- To understand textile design profession, role and responsibilities of textile designer.

Practical No. 3: **5**

- To understand basic language of design and the important terms associated with it.

Practical No. 4: **5**

- Practical application of elements of design in textile design.

Practical No. 5: **5**

- To understand woven fabric, the type of woven fabrics available as per the technique of weaving.

Practical No. 6: **5**

- To introduce knitted fabrics.

Practical No. 7: **5**

- To understand design terminologies related to printed textiles.

Practical No. 8: **5**

- To learn various methods of resisting the fabric and its application in textile design.

Practical No. 9: **5**

- To develop understanding for various types of embellishment techniques on textiles.

Practical No. 10: **5**

- To understand the Textile designers professional practices.

Prescribed Reference Text

- Elements of Textile Design, Student Handbook & Practical Manual, Published by CBSE.
- Watsons Textile Design and Colour - I-Z Grosiki, Universal Publishing, Bombay.
- International Textile Design - Mary Schoeser, John Wiley and Sons Inc. 1985.

CLASS–XI
WOVEN TEXTILE (778)
(ANYONE FROM WOVEN TEXTILE OR TEXTILE SCIENCE)

Preamble

- To Introduce weaving and weaving terminologies.
- To familiarize students to weaving technology, looms category and the preparatory processes.
- To gain an overview of the various woven structures.
- To introduce scope of Woven design industry.

THEORY

Time: 2.5 Hours ***Marks: 50***

Unit–1: Introduction of Woven Textiles **10**

Objective

- The unit deals with all the important definitions of woven textiles and various associated terminologies.
- To sensitize students towards fabric classification and different fiber types.
- Introduction of looms and its parts.

Course Content

1. Introduction to Textiles
   (a) Introduction to textiles and various terminologies.
   (b) The classification of textiles in terms of Woven and Non-Woven on the basis of fiber / yarn types.
2. Introduction to Weaving
   (a) Understand weaving, its history in terms of traditional weaving and the impact of Industrial Revolution.
3. Looms

(a) What is a loom.

(b) Its classifications on the basis of shuttle and shuttle less looms, power loom, handloom, tappet, jacquard and dobby.

Learning Outcome

At the end of the unit the student shall be able.

- To differentiate types of woven fabrics.
- To understand weaving technology.
- To classify and identify various looms.

Teaching Methodology

- Illustrated lectures with power point presentations.
- The teacher shall plan a visit to a weaving unit of a composite textile mill.
- The teacher would be expected to create a library of fabrics to explain.

Assignment

- **Preparation of Fabric swatch book:** 10 sourced fabric swatches (8"x8") of woven, knitted and fused fabrics. The swatches should be made of different fiber and yarns.
- **Group Assignment:** Presentation by a group of 5-6 students. The group shall make a presentation on one type of Loom.

Evaluation Criteria

- Selection of swatches, identification, classification and presentation as a swatch book.
- Presentation – verbal presentation, visual presentation, understanding of the topic, group management.
- Quality of work submitted.
- Viva- voice for swatch book and presentation.

Unit–2: Weaving Technology 15

Objective

- The unit will introduce the students to various loom mechanisms and weaving terminologies.
- Looms classifications and loom parts.
- To introduce yarn preparatory - an important prerequisite for weaving.

Course Content

1. Weaving Mechanism.
   (a) Complete loom details – its parts, motions and other terminologies associated with weaving.
2. Loom Preparatory.
   (a) Processes involved in preparation of loom for weaving – winding, warping, weft preparatory and denting.
3. Weaving terminologies.
   (a) Ends / Warp.
   (b) Picks / Weft.
   (c) Selvedge.
   (d) Fabric Construction – Ends / Inch and Picks / Inch.

(e) Reed Count and warping calculations.

4. Introduction to Weave Design.
   (a) Usage of Point Paper/Graph Paper/Design Paper.
   (b) Methodology of Interlacement of Warp and Weft.
   (c) Construction of Fabric.
   (d) Design, draft and peg plan preparation.
   (e) Different types of draft plan.

Learning Outcome

At the end of the unit the students shall know.

- Complete details about Looms and its parts.
- The preparatory procedures for weaving.
- The process involved in preparing design, draft and peg plan.

Teaching Methodology

- Illustrated lectures with Power Point presentations.
- Visit to a composite textile mill – Preparatory Unit.

Assignment

- Setting up of loom – the student will individually set up a loom- three meters of warp, for eight inch wide swatches.

Evaluation Criteria

- Daily assessment on presentation of work.
- Level of improvement if required.
- Punctuality, regularity and sincerity.
- Quality of loom setup.

Unit–3: Fabric Structure 15

Objective

- To introduce fabric structures and design development.
- To develop plain, twill and sateen weave structure using point paper.

Course Content

1. Introduction to Plain Weave.
   (a) Characteristics of Plain Weave.
   (b) Ornamentation of Plain Weave.
   (c) Derivatives of Plain Weave.
2. Introduction to Twill Weave.
3. Characteristics of Twill Weave.
   (a) Derivatives of Twill Weave.
4. Introduction to Satin Weave.
   (a) Characteristics of Sateen.

(b) Irregular Satin/Sateen.

Learning Outcome

At the end of the unit the students shall know.

- The three basic fabric structures.
- How to draw the structures on design paper.
- How to prepare design, draft and peg plan.

Teaching Methodology

- Illustrated lectures with Power Point Presentations.
- The teacher would be expected to create a library of fabrics to explain and conduct the class.
- The swatches should be collected in terms of the different designs – stripes, checks, textures and other related designs which can be developed using these three weave structures.

Assignment

- Weaving practical – to weave 3 swatches of 8"x8" of plain, twill and sateen weave.
- Preparation of document of the woven swatches.

Evaluation Criterion

1. Quality of weaving.
2. Quality of documentation.
3. Regularity and sincerity.

Unit–4: Woven Fabric and End Uses 10

Objective

- To introduce the students to the commercial aspect of the woven textiles.
- This unit will introduce the students to woven structures and usage of computer for making the designs.

Course Content

- Woven Structures and development of woven design on Computer.
- Overview of the Textile industry.

Learning Outcome

At the end of the unit, the students shall be able.

- To identify Fabric types and product categories.
- To identify fabric as per end use.
- To develop design on computer.

Teaching Methodology

- Illustrated lectures with Power Point Presentations.

Assignment

- **Preparation of Fabric swatch book** – 10 fabrics swatches (8"x8") of plain, twill and sateen. The swatches should be of different types in terms of design patterns.

- **Suggestive** – 1-2 swatches could be "NEW DESIGN" as identified by the students.

Evaluation Criteria

- Selection of swatches.
- Identification and classification of Fabrics.
- Presentation as a swatch book.

PRACTICAL

Time: 2.5 Hours ***Marks: 50***

Unit–1:

- **Assignment No.1:** To understand the different materials (Fiber Types) used to make a fabric and study its characteristics. **2**
- **Assignment No.2:** To study and understand the different types of looms. **2**

Unit–2:

- **Assignment No. 3:** To understand working of a textile unit as studied in the textbook. **2**
- **Assignment No. 4:** To gain knowledge and visualize the effect of interlacing of material. **2**
- **Assignment No. 5:** Set up the loom to be used for weaving in the next assignments. **3**

Unit–3:

Part A

- **Assignment No. 6:** Use graph paper to draw plain weave with drafting and peg plan. **4**
- **Assignment No. 7:** Draw 5 regular or irregular Mat weaves/Warp Ribs/ Weft Ribs with drafting and peg plan. **4**
- **Assignment No. 8:** Draw 5 Balanced/ 5 Un balanced/ "S" Twill/ 5 "Z" Twill with drafting and peg plan. **4**
- **Assignment No. 9:** Draw 5 regular and irregular sateen weave/ satin weave with drafting and peg plan. **4**

Part B

- **Assignment No. 10:** Sample weaving - Plain Weave. **4**
- **Assignment No. 11:** Sample weaving - Mat Weave. **4**
- **Assignment No. 12:** Sample weaving - Rib Weave. **4**
- **Assignment No. 13:** Sample weaving - Twill Weave. **4**
- **Assignment No. 14:** Sample weaving - Sateen Weave. **4**
- **Assignment No. 15:** To study the different variety of fabric as available by their commercial names. **3**

Reference Material

- Woven Textile (Handbook and Practical Manual), Class–XI, Published by CBSE.
- Principles of Weaving - R. Marks, A. T. C. Robinson.
- The Four-Shaft Table Loom - Anne Field, Dryad Press Ltd. London 1987.
- The Ashford Book of Weaving - Anne Field, B. T. Batsford, London, 1992.
- Warp & Weft - A Dictionary of Textile Terms - Dorothy K. Burnham, Charles Seribner's Son, New York, 1981.

- Textile Terms and Definitions - The Textile Institution, Manchester U.K., The Textile Institution, Manchester U.K. 1993.
- International Textile Design - Mary Schoeser, John Wiley & Sons, Inc 1995.
- The New Textile, Trends & Traditions - Chloe Colchester, Thames & Hudson, 1997.

CLASS–XI
TEXTILE SCIENCE (779)
(ANYONE FROM WOVEN TEXTILE OR TEXTILE SCIENCE)

Preamble

Since clothing and home furnishings make up a major portion of the family budget, knowledge of textiles is as appropriate for consumers who wish to purchase wisely as it is for those whose career interests lie in textiles. The marketers of textile fibers, fabrics, and finished goods must all be familiar with the manufacturing methods, construction, and finishing techniques which affect the performance of textile products.

The objective of this course is to understand the raw materials - fibers, fiber source and properties. The conversion of fiber into yarn, yarn spinning processes conversion of yarn for fabric developments (like woven, knit and other forms of fabrics). At the end of the course the students shall be able to understand integration of fiber, yarn and various forms of fabrics and will be able to integrate fabric properties, characteristics, performances and behavior according to various end uses for Apparel and Home furnishing products.

THEORY

Time: 2.5 Hours ***Marks: 50***

Unit–1: Overview of Textile Industries and Textile Fibers **10**

Objectives

- To familiarize the background of Indian Textile Industries.
- To learn and understand Textile terminology.
- To understand the sources and properties of Textile fibers.
- To predict the performances and characteristics of fabrics, according to fiber content for various end uses.

Learning Outcome

After finishing the course, the students shall be able.

- To use appropriate terminology used in Textile Application.
- To understand the interrelationships in Textile Business.
- To get an overview of Textile Industries in India.

Course Content

- The major Textile Production Segments in India.
- Sources of Fabrics.
- Classification of Textile Fibers according to origin and chemical composition; Essential Properties and Performances of Textile Materials like Aesthetic, Durability, Comfort, Safety, Care and Maintenance Properties.

- Properties of Cotton, Flax, Hemp and Jute.
- Properties of Silk, Wool, Mohair and other Natural Fibers.
- Properties of Viscose Rayon, Loyocel and Acetate.
- Properties of Polyester, Nylon, Acrylic and Spandex.

Unit–2: Textile Spinning and Yarn 20

Objectives

- To familiarize Yarn Spinning Process.
- To understand the properties and characteristics of various types of yarns.

Learning Outcome

After finishing the course, the students shall be able.

- To understand basics of Yarn Manufacturing.
- To predict and select different types of yarn for fabric development according to various end uses.

Course Content

- Classification of Yarns; Spun Yarn Production Process, Carded and Combed Yarns; Woollen and Worsted Yarns; Mono Filament and Multi Filament Yarns.
- Yarn Numbering Systems – Cotton Count, Metric Count, Denier, Tex and Deci-Tex. Single and Plied Yarns; Yarn Twist, Amount of Twist and Direction of Twist.
- Textured Yarns – Core Spun Yarn; Novelty and Fancy Yarns, Blended Yarns, Sewing Threads.

Unit–3: Textile Weaving and Woven Fabrics 10

Objectives

- To familiarize the weaving process involved in producing Woven Fabrics.
- To understand the properties and characteristics of various types of Woven Fabrics.

Learning Outcome

- To predict and select different types of woven fabrics according to various end uses.
- To recognize and identify different types of woven fabrics.

Course Content

- Preparatory to weaving, including High speed machines for Winding, Warping, Sizing, Beaming and Weft Winding.
- The Loom, types of Looms, classification and selvedge formations.
- Basic motions of the loom, including the application of Dobby and Jacquards. Non-automatic loom, Automatic loom, Shuttle less weaving machines, Terry looms and Drop box loom.
- Introduction to basic weaves; plain, basket, rib, twill, satin, sateen, dobby, jacquard, crepe, pique, seer sucker, terry, velvet and velveteen.

Unit–4: Other Forms of Textiles 10

Objectives

- To familiarize the basics of different types of Knitting and properties of knitted fabrics, and other forms of Textiles like Non-woven, Felt, Lace and Braids.

Learning Outcome

- To predict and select different types of Knitted, Non-woven, Felt, and Braid according to various end uses.
- To recognize and identify different types : Knitted, Non-woven, Felt, and Braid fabrics.

Course Content

- Difference between Woven and Knitted fabrics.
- General knitting terms : types of knitting machines, circular and flat machines.
- Types of Knitting Stitches.
- Properties of Weft Knitted Fabrics, Jersey, Rib, Purl and Interlock.
- Comparison and properties of Warp Knitted Fabrics.
- Non-Woven Fabrics – Methods and Materials to Manufacture Non-Woven Fabrics, Felt, Embroidery, Tufted Fabrics, Braids and other Narrow Fabrics.

Methodology of Teaching

- Illustrated lectures with slides and visuals along with fibers, yarns, woven, knitted non-woven, lace and braid fabric samples.
- A teacher would be expected to create a library of fabrics to explain and conduct the classes.
- Visit to textile mills & Industry.

PRACTICAL

Time: 2.5 Hours ***Marks: 50***

Experiment No. 1: **3**

- To determine the chemical nature of fiber by burning test.

Experiment No. 2: **3**

- To determine the variation in staple lengths of natural fibers.

Experiment No. 3: **3**

- To determine the yarn fineness using direct count system.

Experiment No. 4: **3**

- To determine the yarn fineness using English count system (indirect).

Experiment No. 5: **2**

- To convert yarn fineness from direct count system into indirect count system and vice versa.

Experiment No. 6: **3**

- To determine the twist direction in yarn.

Experiment No. 7: **3**

- To determine the twist per unit length of a yarn.

Experiment No. 8: **2**

- To determine the difference between a staple fiber yarn and a filament yarn.

Experiment No. 9: **2**

- To differentiate between a single staple fiber yarn and a plied staple fiber yarn.

Experiment No. 10: **2**

- To determine the sequence of process and material flow in yarn manufacturing.

Experiment No. 11: **2**

- To measure the thread density in different kind of fabrics and compare according to end uses.

Experiment No. 12: **2**

- To identify the possible end-uses of woven, knitted and non-woven fabrics.

Experiment No. 13: **3**

- To measure grams per square meter (GSM) of different quality of fabrics and compare the weight according to end uses.

Experiment No. 14: **2**

- To analyze the design of different fabric samples.

Experiment No. 15: **2**

- To visit a fabric store or fabric department within a store and survey the various woven fabrics on display and note the wide variety of fabrics and possible end uses.

Experiment No. 16: **3**

- To find the fabric thickness of different fabrics.

Experiment No. 17: **3**

- To evaluate the wale and course per inch with the help of a pick glass.

Experiment No. 18: **2**

- To source fifteen different nonwoven fabrics from the market physically evaluate their possible end-uses.

Experiment No. 19: **3**

- To prepare a flow chart for weaving or knitting process in the industry.

Experiment No. 20: **2**

- To estimate the drape of various fabrics.

Reference Books

- Textile Science, Students Handbook & Practical Manual, Class–XI, Published by CBSE.

- Textiles, Fiber to Fabric, Corbman.
- Textiles by Sara Kadolph & Anna Langford.

CLASS–XI
GENERAL FOUNDATION COURSE (501)

Time: 3 Hours ***Marks: 100***

Part–I: (Compulsory to all Vocational Courses) *Marks: 50*

A. Business Management and Entrepreneurship 30

(a) **Entrepreneurship Orientation** **5**
Importance and relevance in real life: Emphasis on self employment.

(b) **Entrepreneurship Values and Attitudes** **5**
Innovativeness, Independence, Risk Taking, Analytical ability.

(c) **Entrepreneurial Motivation** **5**
Achievement Planning, personal efficacy, entrepreneurial goal setting.

(d) **Launching of a Business Venture** **15**
Identification of project, steps in setting up a business, information about various institutions providing assistance, project formulation.

B. Computational Skills 10

(a) Percentage, ratio & proportion, profit & loss, discount, simple and compound interest, population growth and depreciation of value of articles using logarithm. **6**

(b) Area and volume: rectangle, parallelogram, circle, cube, cone, cylinder & sphere. **4**

C. Environmental Education 5

(a) Environment and the society.

(b) Environment properties risks in different economic enterprises, in use of raw materials, in processing / manufacturing and designing.

(c) Poverty and environment.

D. Rural Development 5

(a) Agriculture, the back bone of Indian Economy.

(b) Rural development projects in India including Integrated rural development programme.

(c) Agro based rural industries.

(d) Community approach to rural development.

Part–II *Marks: 50*

I. Origin of early Textile fibers and development of: **10**

- Cotton in India.
- Silk in China.
- Linen in Egypt.

II. Historical background and study of the characteristics of traditional Indian Textiles. **5**

III. Traditional Embroidered Textiles of India study with respect to their Historical Development, techniques, stitches, fabrics, colours and symbolism: **30**

- Kasuti of Karnataka.

- Kantha of Bengal.
- Phulkari of Punjab.
- Embroideries of Kashmir: Kashida, Zalakdozi, Zardozi.
- Gujarat Embroideries.
- Chamber Rumal of Himachal.
- Chikankari of U.P.
- Applique of Orrisa.
- Banjara Embroideries of Andhra Pradesh.
- Embroideries of Rajasthan and
- Sujini and applique of Bihar.

IV. Catalogue of the designs collected from various sources depicting the embroidered art of India. **5**

CLASS–XII
ELECTIVE
TRADITIONAL INDIAN TEXTILE (777)

Preamble

India boasts of a rich textile and craft heritage. These traditions not only give meaning to the existence of India's people, but also provide domestic, social and religious framework. Hence textile crafts serve a dual role as they signify cultural values and at the same time is an important source of livelihoods for economically challenged marginalized sections of the society. Crafts including weaving are the second largest employer after agriculture in India and provide livelihood to over 200 million artisans.

The course on 'Traditional Indian Textiles' will initiate students to the world of textile crafts of India, through an appreciation of its unfolding through the ages in order to make them understand finer nuances of painted, printed & woven traditional textiles crafts.

THEORY + PRACTICAL

Time: 2.5 Hours+2.5 Hours ***Theory: 50 Marks + Practical: 50 Marks***

Unit–1: Embroidered Textiles **10+10**

Objectives of the Unit

- To introduce the technique of embroidery for value-addition.
- To create awareness about the different embroidered textiles of India.
- To initiate identification of regional embroideries developed by various communities.
- To understand the origin of technique and design with reference to colours, motifs, layouts of different embroidered textiles.
- To learn about the evolution of embroidered textiles over a period of time.

Learning Outcomes

After completing the unit, the students shall be able to.

- Appreciate the finer nuances of embroideries.

- Classify the regional embroideries of India.
- Identify a specific embroidery style of India on the basis of colours, motifs and layout.
- Identify the influencing factors for development and evolution of a specific embroidered textile.

Course Content

- Introduction to traditional embroidered textiles from different regions of India.
- Categorization of embroidery styles on the basis of region:
  - (a) North India:
    - (i) Kashida from Kashmir.
    - (ii) Phulkari from Punjab.
    - (iii) ChambaRumal from Himachal Pradesh.
  - (b) Western India:
    - (i) Embroidery from Gujarat.
    - (ii) Parsi embroidery.
  - (c) Central India:
    - (i) Chikankari from Uttar Pradesh.
    - (ii) Patti kaKaam from Uttar Pradesh.
    - (iii) Zardozi from Uttar Pradesh.
  - (d) Southern India:
    - (i) Kasuti from Karnataka.
    - (ii) Lambadi embroidery from Andhra Pradesh.
  - (e) Eastern India:
    - (i) Kantha from West Bengal.
    - (ii) Sujani from Bihar, Pipli appliqué from Orissa.
- Study of the above mentioned regional embroideries with reference to origin, technique, raw material, colours, motifs and layout.
- Overview of the historic embroidered textiles and the contemporary scenario.

Methodology of Teaching

- Illustrated lectures.
- Visit to local museums/Haats/exhibitions of craft based products.

References

- Traditional Indian Textiles, Students Handbook & Practical Manual, Published by CBSE.
- Barnard, Nicholas & Gillow, John (1991), Traditional Indian Textiles (Thames & Hudson Ltd.: London).
- Naik, Shailaja D (1996), Traditional Embroideries of India (APH Publishing Corporation: New Delhi).

Unit–2: Resist Dyed Textiles 15+15

Objectives of the Unit

- To introduce the technique of resist dyeing for value-addition.
- To create awareness about the different resist dyed textiles of India.
- To initiate differentiation between yarn resist dyed (Ikat) and cloth resist dyed textiles (Bandhej).
- To understand the origin of technique and design with reference to resist dyed textiles.
- To learn about the evolution of resist dyeing over a period of time.

Learning Outcomes

After completing the unit, the students shall be able to.

- Understand the finer nuances of resist dyed textiles.
- Classify the regional tie-dyed textiles of India.
- Identify specific ikat textiles of India on the basis of technique, colours, patterns and layout.
- Identify specific tie-dyed textiles of India on the basis of technique, colours, patterns and layout.
- Identify the influencing factors for development and evolution of a specific resist-dyed textile.

Course Content

- Introduction to traditional resist-dyed textiles from different regions of India.
- Categorisation of ikat styles on the basis of region:
  (a) Patola from Gujarat.
  (b) Bandhas from Odisha.
  (c) Pochampalli &TeliaRumal from Andhra Pradesh.
- Categorisation of tie-dyed textiles on the basis of region:
  (a) Bandhani from Gujarat.
  (b) Bandhej & Leheriya from Rajasthan.
- Study of the above mentioned resist-dyed textiles with reference to origin, technique, raw material, colours, patterns and layout.
- Overview of the historic resist-dyed textiles and the contemporary scenario.

Methodology of Teaching

- Illustrated lectures.
- Visit to local museums/haats/exhibitions of craft based products.

References

- Traditional Indian Textiles, Students Handbook & Practical Manual, Published by CBSE.
- Barnard, Nicholas & Gillow, John (1991), Traditional Indian Textiles (Thames & Hudson Ltd.: London).
- Dhamija, Jasleen & Sarabhai, Mrinalini (1988), Patolas & Resist Dyed Fabrics of India, (Mapin Publishers: Ahmedabad).

Unit–3: Printed Textiles 15+

Objectives of the Unit

- To introduce the technique of hand block printing for value-addition.
- To create awareness about the different printed textiles of India.
- To initiate differentiation between direct and resist style of printing.
- To understand the origin of technique and design with reference to block printed textiles.
- To learn about the evolution of block printing over a period of time.

Learning Outcomes

After completing the unit, the students shall be able to.

- Understand the finer nuances of block printed textiles.
- Classify the regional block printed textiles of India.
- Identify specific block printed textiles of India on the basis of technique, colours, motifs and layout.
- Identify the influencing factors for development and evolution of a specific block printed textile.

Course Content

- Introduction to traditional block printed textiles from different regions of India.
- Categorization of block printing styles on the basis of region:
  (a) Bagru prints from Rajasthan.
  (b) Sanganer prints from Rajasthan.
  (c) Kalamkari from Andhra Pradesh.
- Study of the above mentioned block printed textiles with reference to origin, technique, raw material, colours, motifs and layout.
- Overview of the historic block printed textiles and the contemporary scenario.

Methodology of Teaching

- Illustrated lectures.
- Visit to local museums/haats/exhibitions of craft based products.

References

- Traditional Indian Textiles, Students Handbook & Practical Manual, Published by CBSE.
- Barnard, Nicholas & Gillow, John (1991), Traditional Indian Textiles (Thames & Hudson Ltd.: London).
- Dhamija, Jasleen & Sarabhai, Mrinalini (1988), Patolas & Resist Dyed Fabrics of India, (Mapin Publishers: Ahmedabad).

Unit–4: Hand-Woven Textiles **10+10**

Objectives of the Unit

- To introduce the technique of handloom weaving in India.
- To create awareness about the different handlooms used for weaving.
- To initiate identification of regional variations practiced by various weaving communities.

- To understand the origin of technique and design with reference to colours, motifs, layouts of different hand-woven textiles.
- To learn about the evolution of hand-woven textiles over a period of time.

Learning Outcomes

After completing the unit, the students shall be able to.

- Appreciate the finer nuances of handloom weaving.
- Classify the regional weaves of India.
- Identify the different handlooms used in India.
- Identify a specific hand-woven textile of India on the basis of technique, raw material, colours, motifs and layout.
- Identify the influencing factors for development and evolution of a specific hand-woven textile.

Course Content

- Introduction to traditional hand-woven textiles from different regions of India.
- Categorisation of weaving styles on the basis of end product:
  - (a) Saris.
    - (i) Benaras Brocades.
    - (ii) Bauchari, Jamdani.
    - (iii) Paithani.
    - (iv) Kanjeevaram.
    - (v) Chanderi, Maheshwari.
  - (b) Shawls.
    - (i) Kashmir shawl.
    - (ii) Kullu & Kinnaur.
    - (iii) Wraps of North-east.
  - (c) Floor coverings.
    - (i) Carpets.
    - (ii) Durries.
- Study of the above mentioned hand-woven textiles with reference to origin, technique, raw material, colours, patterns, layout and end product.
- Overview of the historic hand-woven textiles and the contemporary scenario.

Methodology of Teaching

- Illustrated lectures.
- Visit to local museums/haats/exhibitions of craft based products.

References

- Traditional Indian Textiles, Students Handbook & Practical Manual, Published by CBSE.

- Barnard, Nicholas & Gillow, John (1991), Traditional Indian Textiles (Thames & Hudson Ltd.: London).
- Dhamija, Jasleen & Jain, Jyotindra (1989), Handwoven Fabrics of India (Mapin Publishing: Ahmedabad).

CLASS–XII
PRINTED TEXTILE (778)
(ANYONE FROM PRINTED TEXTILE OR TEXTILE CHEMICAL PROCESSING)

Preamble

Textile printing or printed Textiles is as old as mankind. The earliest examples can be found as early as fifth century. Various records show that printed fabric did exist about 2500 B.C. It is believed that people of China and India were the first to make simple blocks for the printing of cotton cloth, and it is certain that Textile printing was a fairly established Industry in India during the earliest of the Christian era.

Textile prints have played an important role in developing various surfaces. Each region has its own intrinsic style, color and pattern. In India, printed textiles are very popular and are printed in various styles and methods depending on the geographical region.

The prints are now visible in various products like bags and lifestyle accessories.

The purpose of the course "Printed Textiles" is to inform students about the fundamentals of Textile prints. The course will give an overview of History of printed Textiles, Categories of Printed Textiles, Styles and Methods of Printing Textiles and Basic print Design Techniques.

THEORY + PRACTICAL

Time: 2.5 Hours+2.5 Hours ***Theory: 50 Marks + Practical: 50 Marks***

Unit–1: Introduction to Print Design **Theory: 15**

Objectives of the Course

- To introduce and understand Print Design development.
- Relevance of Reference material.
- Understanding Textile Design, repeat and layout.

Learning Outcome

After finishing the unit, the students shall be able to.

- Understand the basic requirement for print Design development.
- List the historical printed textiles.
- Identify the pattern, repeat and layout.
- Identify the influencing factors for design development.

Course Content

- History of printed textiles.
- Understanding the similarity and difference between art and design.
- Various aspects of Textiles Design: Reference material, color, layout and repeats.

Methodology of Teaching

- Illustrated lectures.
- Visit to Museum.

Reference Books

- Printed Textile, Students Handbook & Practical Manual, Published by CBSE.
- Mary Schoeser, Celia Rufey – Thames and Hudson - English and American textiles 1790 to present.
- Joyce Storey – 1972-1992, The Thames and Hudson manual of Textile printing.
- Carol Joyce – Watson- Guptill publication – 1997, the complete Guide to Printed textile for apparel and Home Furnishing.
- Vegetable dyed and printed textiles from India, HHEC.

Unit–2: Categories of Printed Textiles

Theory: 15 + Practical: 10

Objectives of the Course

- To develop an understanding for surface design development.
- To sensitize students towards various types of Prints.
- To understand forms, shape and color combinations for various categories.
- To sensitize students towards specific influencing forms, objects and shapes.
- To develop an ability to recognize the design in each type of print.

Learning Outcome

- After completing the unit, the students shall be able to.
- Understand forms and colour combinations.
- Develop an understanding for various categories of prints.
- Identify the types of prints.

Course Content

Introduction to various types of Design and their categories.

- Toile prints.
- Pucci prints.
- Geometric prints.
- Graphic prints.
- Floral prints.
- Conversational prints.
- Liberty prints.
- Country inspired prints.
- Nautical prints.
- Victorian prints.
- Scenic prints.

- Animal prints.
- Ethnic prints.
- Folklore prints.

Methodology of Teaching

- Illustrated lectures.
- Demonstration and Practical Assignments.

Practical Assignments

- Collection of prints as per specified categories and preparation of swatch book.
- Development of one print in each categories 8"x8" block.

Reference Books

- Printed Textile, Students Handbook & Practical Manual, Published by CBSE.
- S. Meller, J. Elfers Thames and Hudson Ltd. Textile designs – 200 years of patterns for Textiles.
- Carol Joyce – Watson- Guptill publication – 1997, the complete Guide to Printed Textile for apparel and Home Furnishing.

Unit–3: Basic Print Design Techniques **Practical: 30**

Objectives of the Course

To develop an Interest and confidence for creating Print designs.

- To explore various art media for developing interesting design.
- To develop the ability to choose the most appropriate technique for creating interesting designs.

Learning Outcome

After completing the unit, the students shall be able to.

- Create interesting design by using various art media.
- Appreciate the techniques involved in developing interesting textures.
- Use art media more appropriately and confidently.
- Develop interesting colour combinations and designs.
- Understand the relation between forms and background.

Course Content

Use of following innovative techniques for development of interesting surfaces.

- Etching.
- Stencil.
- Collage.
- Inter-cutting.
- Resist (Bleach/Wax).
- Dry-brush.

- Photocopy.
- Sponge.
- Stamping.

Methodology of Teaching

- Illustrated lectures.
- Demonstration and Practical Assignments.

Practical Assignments

- Preparation of Textile designs using different techniques.
- Development of thirty 8x8 swatches in different techniques and mix media.

Reference Books

- Printed Textile, Students Handbook & Practical Manual, Published by CBSE.
- Carol Joyce – Watson- Guptill publication – 1997, The Complete Guide to Printed Textile for Apparel and Home Furnishing.
- Angel Fernandez –A&C Black, 2009, Fashion print Design.

Unit–4: Style & Methods of Printing Textiles

Theory: 20 + Practical: 10

Objectives of the Course

- To introduce styles and Methods of Printed Textiles and its effect of design.
- To learn the process involved in Printing Textiles.
- To gain Knowledge of evolution of printing process.
- To understand the origin and history of styles and methods.

Learning Outcome

- After completing the unit, the students shall be able to.
- Understand the different styles and methods involved in printing Textiles.
- Identify the correct method and style for printing Textiles.
- Recognize the difference between different kinds of prints.
- To get an overview of printing methods.

Course Content

Study of Styles and Methods involved in printing Textiles.

- Direct, Resist and Discharge Methods.
- Block Printing Style.
- Screen Printing Style.
- Roller Printing Style.
- Digital Printing Style.
- Transfer Printing.

- Foil Printing.
- Hand Printing.
- Sublimation.

Printing of designs using different methods and styles of printing.

Methodology of Teaching

- Illustrated lectures.
- Demonstration and Practical Assignments.

Practical Assignments

- Printed Textile, Students Handbook and Practical Manual, Published by CBSE.
- Preparation of Textile designs for developing screen and block printed swatches.
- Development of twenty 8x8 swatches in different styles of printing.

Reference Books

- Joyce Storey – 1972-1992, The Thames & Hudson manual of Textile printing.

CLASS–XII
TEXTILE CHEMICAL PROCESSING (779)
(ANYONE FROM PRINTED TEXTILE OR TEXTILE CHEMICAL PROCESSING)

Objectives of the Course

- To gain an overview of processes involved in Dyeing , Printing and Finishing of Textile materials.
- To familiarize students about chemical processing and its role in fabric Manufacturing.
- To introduce preparatory process of major Textile fibers.
- To study dyeing printing and finishing of Natural fibers.

THEORY

Time: 2.5 Hours ***Marks: 50***

Unit–1: Introduction to Chemical Processing-Pretreatments 15

Course Content

- Textile Chemical processing for fibers.
- Impurities present in the Natural and Synthetics Fibers.
- Elementary knowledge of processing.
- Different processes e.g., singeing, de-sizing, scouring, bleaching & mercerizing.

Learning Outcome

After finishing the course, students will be able to understand.

- Various technical terminology used in the industry.
- Various types of impurities presents in the Substrates.

- The processes involved in removing impurities.

Teaching Methodology

- Illustrated Lectures with Power Point presentation and Slides.

Unit–2: Textile Dyeing 15

Content

- Suitability of Dyes and dyeing methods, important classes of dyes for natural and man-made fibers e.g., direct, acid, basic, vat, azoic, sulfur and disperse dyes.
- Important features of dyes.
- Dyeing machines & special dyeing effects.

Learning Outcome

After finishing the course, students will be able to.

- Dye all kind of Textile Fabrics.
- Select dyes as per the type of fabrics.
- Identify dyeing methods used in the Industry.

Teaching Methodology

- Illustrated Lectures with Power Point presentation and Slides.

Unit–3: Textile Printing 10

Content

- Printing paste ingredients.
- Introduction to various methods of printing , specific features and limitations of various methods, Such as Hand Block Printing, Hand Screen printing, Automatic Flat Bed Screen Printing, Rotary Screen Printing, Heat Transfer Printing.
- Style of Printing (Direct Prints, Discharge Prints, Resist Prints, Pigment Prints, Blotch Prints, Flock Prints, Burnout Prints, Duplex Prints, Engineered Prints, Warp Prints) & their Specific feature for their Identification.

Learning Outcome

After finishing the course, students will be able to understand.

- Various terminology used in textile printing.
- Styles and methods involved in printing.
- Various effects produced by various styles of printing.
- Limitation of the printing methods.

Teaching Methodology

- Illustrated Lectures with Power Point presentation and Slides.

Unit–4: Textile Finishes 10

Content

- Classification of the finishes.
  - (i) According to Designer/Merchandiser /Sales Persons.
  - (ii) According to Textile Chemist.
  - (iii) According to Degree of Performance.
- Objectives of the various finishes.
  - (i) Types of Calendaring and its objective.
  - (ii) Napping.
  - (iii) Emerizing.
  - (iv) Parchmentising.
  - (v) Shape Retention Finishes.
  - (vi) Shrinkage Control Finishes.
  - (vii) Sanforizing.
  - (viii) Decatizing.
  - (ix) Soil Release /Stain Repellent Finish.
  - (x) Water Repellent & Water Proofing.
  - (xi) Anti – Microbial Finish.
  - (xii) Flame Retarding Finish.
  - (xiii) Garment Washing.

Learning Outcome

After finishing the course, students will be able to understand.

- Types of finishes and their performance.

Teaching Methodology

- Illustrated Lectures with Power Point presentation and Slides.

PRACTICAL

Time: 2.5 Hours ***Marks: 50***

Experiments :

1.	Desizing of cotton Fabrics by Acid Desizing method and calculate the weight loss in the Process.	**2**
2.	Scouring of cotton by Sodium Hydroxide and measure water permeability of the process.	**2**
3.	Bleach the cotton fabric with the bleaching powder or Sodium Hypo chlorite.	**2**
4.	Bleach the cotton fabric by hydrogen Peroxide.	**2**
5.	Degumming of the Silk.	**2**
6.	Bleaching of the silk with the Hydrogen Peroxide.	**2**
7.	Dyeing of cotton with Direct Dyes.	**2**
8.	Dyeing of cotton with Reactive dyes.	**2**
9.	Dyeing of cotton with Vat dyes.	**3**
10.	Dyeing of cotton with Sulphur dyes.	**3**
11.	Dyeing of cotton with Azo dyes.	**2**
12.	Dyeing of wool with Acid Dyes.	**2**

13. Dyeing of wool with Reactive Dyes. **2**
14. Dyeing of Silk with Acid Dyes. **3**
15. Dyeing of Nylon with Acid Dyes. **3**
16. Tie and dye of cotton with Direct dyes (Resist Print). **2**
17. Batik Print on the Cotton Fabrics (Resist Print). **3**
18. Printing on the polyester fabrics by Pigment colour. **3**
19. Printing on cotton fabrics by Naptholcolours. **3**
20. Printing on cotton fabric with natural colours. **3**
21. Collect the sample of finished fabrics and describe the type of finishes it may have. **2**

MARKING SCHEME

Two Practical from each Section shall be Conducted.

(i) Session Work. **20**
Maintenance of Record.
On the Lab Learning.

(ii) Viva Voice. **10**

(iii) All the laboratory experiments will carry five marks each, they should be evaluated on the basis of evenness of the dyeing and printing, neatness and cleanliness maintained during the practical. **20**

CLASS–XII
GENERAL FOUNDATION COURSE (501)

Time: 3 Hours ***Marks: 100***

Part–I: (Compulsory to all Vocational Courses) *Marks: 50*

A. Business Management and Entrepreneurship **30**

Management of Business

Elementary treatment/exposure to basic conceptual frame work of the topic listed below:

(a)= Basic Function. **6**
(b) Marketing Management. **6**
(c) Financial Management. **6**
(d) Production Management. **6**
(e) Personnel Management. **6**

B. Computational Skills **10**

1. (a) Solution of linear equations and their application to problem of commercial mathematics. **5**
   (b) System of linear equations and in equation in two variables. Applications in formation of simple linear programming problems.
2. Statistics: Raw data, bar charts and Histogram; Frequency Tables; Frequency Polygon; Ogive; Menu, Median and Mode of ungrouped and grouped data; Standard Deviation; Introduction to Mortality tables; Price Index etc. Introduction to Computers. **5**

C. Environmental Education & Rural Development **10**

1. **Environmental Education** **5**

(a) Modernisation of agriculture and environment, irrigation, water logging, use of fertilisers, pesticides, soil erosion, land degradation (desertification and deforestation), silting and drying of water resources.

(b) Rational utilisation, conservation and regeneration of environmental resources (soil, air, water, plant, energy, minerals).

2. **Rural Development** **5**

Principles and goals of rural development, major problems/constraints in rural development in India.

Part-II *Marks: 50*

I. Development of Dyeing, Printing and Painting with Special Reference to Indian Fabrics 5

- Resist dyed.
- Printed.
- Painted.

II. Traditional Indian Printed and Painted Fabrics. 12

- Kalamakari of AP.
- Phad painting.
- Pichhwals.
- Madhubani.
- Gujarat Printing Saudagiri.
- Ajrak.
- Bagru Prints.

III. Resist Dyed Fabrics: Study with Respect to the Techniques used, Design etc. 10

- Bandhani of Gujarat and Rajasthan.
- Ikat of Orissa.
- Patola of Gujarat.
- Telia Rumal, Mashru.

IV. Traditional Woven Textiles - Motifs and Techniques. 18

- Balucharis and Jamdani of Bengal.
- Brocades of Banaras.
- Painthani of Maharashtra.
- Tanchoi.
- Shawls of Kashmir.
- Woven fabrics from North East States.
- Carpets and Rugs.

V. Catalogue of Design Related to Printed, Painted Resist Dyed and Woven Textiles. 5

LIST OF RECOMMENDED BOOKS

1. Textile Science, Students Handbook & Practical Manual, Class XI, Published by CBSE.
2. Textile Chemical Processing, Students Handbook & Practical Manual, Class XII, Published by CBSE.

3. The Ashford book of Dyeing by Ann Milner.
4. Lab experiments on textile chemical processing by S.P. Mishra.
5. Chemistry of dyes and principles of dyeing by Dr. V.A. Shenai.
6. Technology of Bleaching and Mercerizing by Dr. V.A. Shenai.
7. Technology of Printing by Dr. V.A. Shenai
8. Technology of Textile Printing By R.S.Prayag.
9. Textile chemical Processing by P. Angappan, A. Edwin Sunder,V. llango.
10. Chemical treatments of textiles for colouration by P. Angappan, A. Edwin Sunder,V. llango.
11. The Dyeing of Textile fibres by Joseph Rivlin.
12. Dyeing and Chemical Technology for textile fiber by E R Trotman.
13. The Dyeing of Textile Materials by Jose Ceggra.
14. Cellulosic Dyeing by J Shore.
15. Color for Textiles by W Ingamells.
16. Handbook of Textile Processing Machineries By R S Bhagwat.
17. Textile Dyeing Operations By S V Kulkarni, CD Blackwell, AL Blackard, AW Alexander.
18. Textile Auxiliaries and Finishing Chemicals by AA Vaidya and SS Trivedi.
19. Fiber to Fabric by Corbman.

LIST OF FABRIC, DYES, CHEMICALS AND EQUIPMENTS

1. Fabrics : Silk, wool, Nylon, PET, Acrylic, Blends - 2 ml each.
2. Dyes : Acid dyes, Reactives, Disperse dyes.
   Basic dyes - 100 gms - 250 gms,
3. Chemicals required:
   H_2O_2,NaCl.
   Formic Acid, CH COOH.
   R Salt L.
   Sodium Bicarbonate.
   Sodium Chloride.
   Sodium hydrosulphate.
   Urea.
   Potassium Carbonate.
   Sodium Chlorate.
   Gums - Alginate, Indalca.
   Lacquer, coloured Discharging chemicals.
   90% phenol.
   Sy-cresol.
   Con. HNO_3.
   Ammonia.
   Borax.
   Iodene.
   Benzene.

Petrol (White).

Carbon-tetra-chloride.

Acetone.

Turpentine oil.

Sol. hydroxide.

Glycine.

Soap sol.

Sodium hypochlorite.

Sodium carbonate.

Potassium permanganate.

Sodium hydrosulphite.

Sod. bi Sulphite.

EQUIPMENTS FOR PRINTING LABORATORY

1. Tables : Teak or Kail top.

   22 cm × 540 cm : Covered with 6 layers of Jute and one layer of marken.
2. Printing trolleys (for each table).
3. Printing trays (for block printing for each table (enamel trays) about 27 cm × 38 m.
4. Weighing scale for measuring.
5. Thermometer for maintaining a chart for the exact shade.
6. Staple gum for fixing the Nylon to the wooden frames – 1.
7. Steamer : For fixing the colour and the fabric – 1.
8. Oil Stove : For beating the colour for Rapid indigo dyes.
9. Bowls Enamel : 4 Bowls for 10^3 diameter for each table. 4 Bowls of 5^3 diameter for each table (To mix the dyes).
10. Spoons:

    4 table spoons stainless steel for each table.

    4 wooden spoons for each table.
11. Squeezers : 30 cms : 15 cms : 20 cms for each table for screen printing.
12. Air tight containers for storing readymade colours (wide mouthed bottles).
13. Brushes : Artists brushes : Complete set.
14. Tools for carving wooden blocks.
15. Screens rack for keeping the readymade screens.
16. Wooden Screens 25 cms × 25 cms.

    30 cms × 65 cms.

    35 cms × 45 cms.
17. Measuring cylinders 500 ml.
18. Set of lino tools.
19. Roller for paints : 3 different standard sizes.

CONSUMABLE MATERIALS FOR PRINTING LABORATORY

1. Staples for the Staple Gum.
2. Organdie Fabric or Nylon Fabric for Screen.
3. 0.5 cm thick foam for the trays.
4. Jute and Muslin cloth for the trays.
5. Linoleum sheet.
6. Turpentine oil.
7. Enamel Paint (white).
8. Fevicol and quick fix.
9. Blocks for printing (sagwan wood).
10. Enamel paints.
11. Cartridge papers.
12. Dyes for printing of following types:
    (i) Potato printing (Craylin colours).
    (ii) Match stick printing (Craylin colours).
    (iii) Lino Printing (Acramin dyes) with layer of printing inks.
    (iv) Block printing (indigo and rapid/Acramin dyes).
    (v) Screen printing:
        - Paper cut screens.
        - Enamel screens.
    (vi) Card board 5 mm thick.
    (vii) Match boxes.
    (viii) Mustard oil.
    (ix) Multani mitti (block makers).

DESIGN & INNOVATION

Introduction

The Course on Design Fundamental is intended to introduce ideas, methodologies, principles, and skills that comprise a common knowledge base important to all design disciplines. These fundamental will foster a multidisciplinary design experience among students and will prepare them to move to the next level. It will provide the participants with foundation and fundamentals skills in design. The program is designed to provide a pathway to a range of vocational qualifications, including diplomas of graphic design, visual merchandising, visual arts, digital design, screen and performing arts.

The program provides a comprehensive range of skills and knowledge required as preparation for entry level jobs. The course will benefit applicants who have little or no training or experience in art and design and who wish to begin formal education in this field.

CLASS–XI
ELECTIVE
DESIGN & INNOVATION (772)
THEORY

Time: 3 Hours

Total: 100 Marks
Theory: 60 Marks
Practical: 40 Marks

Unit–1: Introduction to Design

Session–1: Concept of Design

- Design Definition.
- Design versus Art.
- Design and Environment.
- The basis of Design Process.
- Use Design in today's scenario.

Session–2: Design Fundamental

- Principles of Design.
- Elements of Design.
- Colour Theory.
- Understanding of Color wheel.
- To increase and build sensitivity to the forms around them.
- To identify the revolving still life and outdoor in vicinity of environment.
- To relate the elements of design to understand design process for their projects.
- Understanding the colour quality, intensity, relationship with other colours, textures, shape.

Unit–2: Design Tools and Techniques

Sessions–1: Produce Drawing

- Defining Drawing.
- Different techniques of drawing.
- Exploration of medium.
- Compositions and Perspectives.
- Tonal Techniques.
- Use of Dreams and Music for creative Drawing.
- To identify the use of tone and value, Texture/Frottage.
- Identify to use contour line drawing (continuous or cross contour).

Unit–3: Occupational Health and Safety

Session–1: Work Safe Review Module

- Safety and Health responsibility.
- Role of War safe Inspector.
- Hazard identification, Risk assessment and Risk control.
- PPE.
- Dealing with emergency.
- Design a promotional poster advertising what students need to know about Safety and Dangers, or be warned about while working at College.

Unit–4: Practical Workshop

Session–1: Knowledge Workshop

- Source and apply design industry knowledge.
- Source and apply information on the history and theory of design.
- Project 1: Research on a Contemporary designer.
- Project 2: Photograph and Report on Signage and Window display.
- Project 3: Critique the Design of a Product.

Session–2: Design Concepts Workshop

- Design concepts workshop road signs.
- Design concepts workshop zoological and botanical logo.
- Design concepts workshop T-shirts design.

Session–3: Graphic Design Workshop

- Produce Designs for Clothing Range, Shoes or CD Cover.
- Color zones applied Colour assessment.
- Poster Design for an Opera or Ballet.

CLASS–XII
ELECTIVE
DESIGN & INNOVATION (772)
THEORY

Time: 3 Hours

Total: 100 Marks
Theory: 60 Marks
Practical: 40 Marks

Unit–1: Three Dimensional Design — 10

Seesion–1: Introduction to Fundamentals of 3-Dimensional Design

- Differentiate 2-dimentional and 3-dimensional design.
- Explore and apply the creative design process to 3D forms.
- Produce Sculpture using Three Dimensional.
- To apply creative design process to the development of 3-dimensional forms.

Session–2: Three Dimensional Design Workshop — 10

- Project 1: 3D Design hand cutting tool.
- Project 2: 3D Design Maquette Construction.
- Project 3: 3D Design Bridge Design.
- Project 4: 3D Design Shop Refit.

Unit–2: Three Dimensional Design Applied — 15

Session–1: Introduction to Spatial Design

- Principles and Elements of 3-D Design Applied.
- Research and apply techniques for application to spatial design.
- Explore the use of colour in 3-D Design.

Session–2: Spatial Design Workshop

- Project 1: Exploration and use of 3-D Elements of Design.
- Project 2: Colour Sphere Model to explore Hue and Value
- Project 3: To create a Exhibition Design on any theme; Examples part A: Unity, Harmony

Unit–3: Design Tools and Techniques – Digital — 10

Session–1: Introduction to 3-D Design Digital Tools

- Methods of developing 3-dimensional design.
- Brief study on software applications like Photoshop, AutoCAD, Flash, Corel and Maya

Unit–4: Digital Workshop — 15

- Apply techniques to produce digital images.
- Digitise images for reproduction.

- Project 1: Digital workshop Animorph.
- Project 2: Magazine Cover.
- Project 3: The World's Greatest Poster.

LAB REQUIREMENT FOR TWENTY STUDENTS

S. No.	List of Items
1.	**Technical Drawing Equipment** - Computer station Licensed software (Autocad by Autodesk or Adobe Creative Suite CS6 or higher). - Printer. - Photography supplies, digital photo frame, access to photo printers.
2.	**Drawing Equipment and Materials** - Soft boards All around the walls. - Stools. - Black board. - White board. - Crayons, pastels, charcoal. - Colored pencils, pens, washable markers, calligraphy pens, erasers. - Variety of paper, cardboard. - Dry-erase boards, markers. - Chalk, chalk board, erasers. - Non-toxic paint (tempera, acrylic, oil, water colour, finger paint). - Colored ink, stamps, wood blocks, natural materials, cardboard. - Paint brushes, rollers, squeeze bottles, spray bottles, sponges, paint scrapers. - Glue, paste, glue sticks, pots, brushes, spreaders. - Paper scraps, magazines, cards, wrapping paper, ribbon, cellophane, newspapers. - Cardboard tubes, boxes, rolls. - Pair of scissors. - Staplers. - Geometry sets. - Paper punches. - Clips, thumb tacks. - Adhesive tapes, glue, craft glue. - Sandpaper, cloth, string, wire.

MUSIC TECHNICAL PRODUCTION

Introduction

This Course will provide the students with a practical introduction to recording processes including, mixing, editing and post-production. It will aid the students to gain skills in recording studios and performance venues and get on track to a career in technical production. Also it will develop the necessary skills to record and produce music as well as live sound operation. This course will allow the students with the opportunity to participate in recording sessions and follow the production processes through to the completion of a demo recording. Moreover, it is intended to give the students the basic skills to begin an exciting career in music sound production or for the further study.

CLASS–XI
ELECTIVE
MUSIC AESTHETICS (768)
THEORY + PRACTICAL

Time: 2.5+2.5 Hours ***Theory: 50 Marks***
Practical: 50 Marks

SECTION–I

1. Learning Objectives **Theory: 5**

(a) **BSBOHS201A Participate in OHS Processes**

Unit Descriptor, Elements and Performance Criteria Pre-Content, Elements and Performance Criteria, Required Skills and Knowledge, Range Statement.

(b) **CUFIND201A Develop and Apply Creative arts Industry Knowledge**

Unit Descriptor, Elements and Performance Criteria Pre-Content, Elements and Performance Criteria, Required Skills and Knowledge, Range Statement.

(c) **CUSMLT201A Develop and Apply Musical Ideas and Listening Skills**

Unit Descriptor, Elements and Performance Criteria Pre-Content, Elements and Performance Criteria, Required Skills and Knowledge, Range Statement.

2.

(a) **OHS and Music Industry and Assignments** **15+15**

Introduction, Activity, Overview, Distribution, Role in music business, Song writers and the role of the publisher, Mechanical royalties, Performing royalties, New Technology, Music Industry-management, Music industry-the laws, promoting a band, Stickers, Banners, Business cards, Flyers and posters, Website\ Facebook\ Myspace, Merchandise Table, Emails, Utilize the internet, Developing an image for a band, putting on a gig, Secretes to success in the music industry.

(b) **Studio Location and Assignments** **15+20**

Introduction, Fire safety, A historical world tour of music, Live performances, Introduction to musical styles, Broad categories of music – art music , popular music, traditional music, music genres, Examining the styles of the blues, Characteristics of the blue form, Practicing the style of "The Blues", Examining the style of "Ska and Reggae", Rock steady, Reggae takes over, Reggae's transformation, Music characteristics, Etymology, History of reggae, Music characteristics, Drums and other percussion, Bass, Guitars, Keyboards, Horns, Vocals, Lyrical themes, Criticism of dancehall and ragga lyrics, Subgenres, Early reggae, Roots Reggae, Dub, Rockers, Lovers rock, Newer Styles and spin-offs, Dancehalls, Raggamuffin, Reggaeton, Reggae Fusion, Reggae outside the Caribbean, Practicing the style of Ska/ Reggae, Examining the styles of the rock, Practicing the style of rock, Music Style – Metal, Heavy metal, History of Heavy Metal, Musical and Vocal Styles, Genres, Avant Grade Metal, Black Metal, Celtic Metal, Death Metal, Doom Metal, Gothic Metal, Grindcore, Hair Metal, Metalcore, New wave of British

heavy metal (NWOBHM), Nu-metal, Power metal, Progressive metal, Thrash metal, The future of heavy metal, Practicing the style of Metal, Recording time.

SECTION–II

1. Learning Objectives — Theory: 5

(a) **CUESOU07B Apply a General Knowledge of Audio to Work Activities**

Unit Descriptor, Elements and Performance Criteria, Required Skills and Knowledge, Range Statement.

(b) **ICAU2005B Operate Computer Hardware**

Unit Descriptor, Elements and Performance Criteria Pre-Content, Elements and Performance Criteria, Required Skills and Knowledge, Range Statement.

2. Laboratory Lesson Plans and Assignments — 10+15

Introduction, Hardware/Software relationships, Introduction to DAW (Digital Audio Workstation), Introduction to Garage Band, Features of Garage Band, Recording audio into Garage Band, Practical time for Garage Band, Introduction to Apple logic, Using MIDI and MIDI editing in LOGIC, Recording audio into Logic, Features of Logic, Practical time for Logic, Introduction to mixing, Using mixing tools, Introduction to EQ, Introduction to Effects, Introduction to Dynamics.

CLASS–XI
ELECTIVE
MUSIC PRODUCTION (769)
THEORY + PRACTICAL

Time: 2.5+2.5 Hours — ***Theory: 50 Marks*** / ***Practical: 50 Marks***

SECTION–III

1. Learning Objectives — Theory: 5

(a) **BSBWOR203A Work Effectively with Others**

Unit Descriptor, Elements and Performance Criteria, Required Skills and Knowledge, Range Statement.

(b) **CUSSMLT202A Apply Knowledge of Music Culture to Music Marking**

Unit Descriptor, Elements and Performance Criteria, Required Skills and Knowledge, Range Statement.

(c) **CUSMPF201A Play or Sing Simple Musical Pieces**

Unit Descriptor, Elements and Performance Criteria, Required Skills and Knowledge, Range Statement.

2. Music Culture and Assignments — 10+20

Introduction, What is Music?, What is Culture? , Modern music, Examining music cultures around the world, Examining Australia's music culture, The future of Music Industry, Examining the musical instrument: Human voice, Examining the musical instruments: the guitar, Types of Guitars, Examining the musical instruments: the piano, Examining musical instruments – percussion, Examining musical instruments: Synthesizers-what is a Synthesizer, How a Synthesizer creates a sound, Signal generating and processing components, Modulation and control components, Oscillators, Common Synthesizer waveforms, Noise: Pink/red, blue, white**,** Reshaping waveforms, Filters, Types of filters, Cutoff frequency, Resonance, Drive, Filter Slope, Modulation, LFO Controls, LFO envelopes, Global controls, Introduction to music notation, time signatures, scales, Music theory-Chords and symbols, What is an ensemble.

SECTION–IV

1. Learning Objectives **Theory: 5**

(a) **CUSSOU201A:** Assist with sound recording.

(b) **CUETGE15B:** Handle physical elements during bumb in bump out.

2. **Introduction and Assessment:** Digital portable recorders. **10+10**

3. **Resources and Assessment:** Sound production specialist. **10+10**

4. **Additional resources.** **10+10**

CLASS–XII
ELECTIVE
MUSIC AESTHETICS (768)
THEORY + PRACTICAL

Time: 2.5+2.5 Hours ***Theory: 50 Marks***
Practical: 50 Marks

Unit–1: 10+10

1. **Learning Objectives**

   CUESOU07B Apply a general knowledge of audio to work activities.

   Unit Descriptor, Elements and Performance Criteria Pre-content, Elements and Performance Criteria, Required Skills and Knowledge, Range Statement.

2. **Assessment -** apply audio activities, create a system diagram, create an input list and stage production, Live sound required skill is knowledge test.

3. **Assessment matrix.**

Unit–2: 15+25

1. **Learning Objectives**

   - CUEIND01C Source and apply entertainment industry knowledge.
   - CUFSOU204A Perform basic sound editing.
   - CUSOHS301A Follow occupation health and safety procedures.
   - CUSMPF304A Make a music demo.

   Unit Descriptor, Elements and performance criteria Pre-content, elements and performance criteria, required skills and knowledge, range statements.

2. **Resource -** Working in groups, diversities.

3. **Assessment -** Arrange audio lops, industries bodies, industries overview, song structure and arrangement, copy right.

Unit–3: 25+15

1. **Learning Objectives**

   - CUESOU03C Operate professional audio equipment.
   - BSBWOR203A Work effectively with others.
   - CUECOR01C Manage own work and learning.
   - CUESOU09B Manage and compile audio replay material.
   - CUSSOU302A Record and mix a basic music demo.

Unit Descriptor, Elements and performance criteria Pre-content, elements and performance criteria, required skills and knowledge, range statements.

2. **Resource -** Basic mics principles, Week four pro tools session, Week 5 pro tools session, Week 6 logic session, Week 7 pre-assessment exercise, Wee 8 Logic session, Week 9 lesson plan, Week 10 lesson plan, Work effectively with culturally diverse clients and co-workers, Working in Groups Diversity.

3. **Assessment Tools -** Documentation, Portable recording practical demonstration, Studio session participation, final CD portfolio submission.

4. **Assessment matrix.**

CLASS–XII
ELECTIVE
MUSIC PRODUCTION (769)
THEORY + PRACTICAL

Time: 2.5+2.5 Hours ***Theory: 50 Marks***
Practical: 50 Marks

Unit–1: **10+5**

1. **Learning Objectives**

   CUESOU01C Repair and maintain audio equipment.

   Unit Descriptor, Elements and Performance Criteria Pre-content, Elements and Performance Criteria, Required Skills and Knowledge, Range Statement.

2. **Resources** **30+25**

   Maintenance overview, Electric shock precautions, connectors, Cabling, Balanced and Unbalanced wiring, Microphone Theory, Microphone characteristics, Microphone construction, console maintenance, alignments of signals, tape machine power amps fuses, electric theory, circuit types, effect of conductor mass on current draw.

   Repair and maintain sound equipment.

   Workshop rules and safety, XLR Parts, Soldering workshop task 1, adaptor lead construction, testing leads using a cable lead, testing leads using a multi meter.

3. **Assessment Tools -** Connector researchers, Microphone research, repair and maintain assessment. **10+20**

LIST OF RECOMMENDED BOOKS

1. Music Aesthetics I, Students Handbook, Class–XI, Published by CBSE.
2. Music Production I, Students Handbook, Class–XI, Published by CBSE.
3. Music Aesthetics, Students Handbook, Class–XII, Published by CBSE.
4. Music Production, Students Handbook, Class–XII, Published by CBSE.

SUGGESTED LIST OF EQUIPMENTS

- Microphones – Newmen Condensor Microphones (at least Six).
- Audio Console 16 track Analogue/Digital.
- Stand (Giraffe) (6).
- Computer with sound card and 2 GB Ram & 500 GB.
- HDD Capable of running Audacity.
- XLR Cables & Connectors.

- Jack Connectors.
- Studio speakers for Monitoring (2 L& R).

MASS MEDIA STUDIES AND MASS MEDIA PRODUCTION

Introduction

This course aims at grooming the natural talent of students and exposing them to ever-changing skills needed in the media and entertainment industry with hands-on experience. The course is designed to provide fundamental information on analysis of film, TV (including News), print articles, understanding of the pipeline multiple products of the media & Entertainment industry (TV show/segment, film, article, ad – film, etc.), concept of assembly line, animation, roles people play, skills & specializations, the creative process, aesthetics, design, framing, composition, writing, ideation and finally technology usage in the media & entertainment industry.

CLASS–XI
ELECTIVE
UNDERSTANDING THE EVOLUTION AND FORMS OF MASS MEDIA (738)
THEORY + PRACTICAL

Time: 3 Hours + 2 Hours ***Theory: 60 Marks***
Practical: 40 Marks

Unit–1: Introduction to Mass Communication **6+4**

- Introduction to Media.
- Aspects of Mass Communication.
- Impact of Mass Communication on psyche and society.
- Barriers to Communication.
- A brief history of Mass Media.

Unit–2: Understanding Fiction **12+8**

- Story as a self-content world.
- Story as a subjective experience.
- Content of a story.
- Techniques of storytelling.
- Genre of a story.
- Fable, myth, legend, short story.

Unit–3: Understanding the Language of the Medium **18+12**

1. **Understanding of Cinema–I**
   - Cinema as a narrative in distinction from the other arts.
   - Cinema as a complex narrative.
2. **Understanding of Cinema–II**
3. **Understanding of Television**

- Specificity of TV as a medium.
- Purpose of TV Programming.

4. **Print Media and its Type**
   - Types of Print Media.
   - Analyzing the content of a newspaper.

5. **Radio Genre in Radio Programming**
   - News.
   - Drama.
   - Music.

6. **Internet**
   - The Internet Players, layers, data.
   - How they function and how we connect with them.

Unit–4: Evolution of the Media in Indian Cinema — 12+18

1. **Indian Cinema.**
   - Hindi cinema.
     (i) DG Phalke and silent era.
     (ii) Coming of sound and Studio era.
     (iii) Satyajit Ray and Non-main stream cinema.

2. **Television in India.**
   - Doordarshan in the first phase of local stations: Black and White transmission.
   - SITE experiment.
   - Color Television, AASIAD 1982-SATELLITE TRANSMISSION [INSAT].
3. Development of press in India.
4. History and Development of Radio Broadcasting.

Unit–5: Understanding Non-Fiction — 12+8

- Defining Non-fiction.
- What is Documentation.
- The Approach to Reality.

CLASS–XI
ELECTIVE
THE CREATIVE AND COMMERCIAL PROCESS IN MASS MEDIA (739)
THEORY + PRACTICAL

Time: 3 Hours + 2 Hours — ***Theory: 60 Marks*** / ***Practical: 40 Marks***

Unit–1: Introduction to the Production Process — 18+12

1. **Film**

- Pre- shooting stage.
- Shooting Stage.
- Post-shooting Stage.

2. **TV**
   - Pre- shooting stage.
   - Shooting Stage.
   - Post-shooting Stage.

3. **Print**
   - Planning, writing, editing, designing.

4. **Radio**
   - Planning, recording, editing, transmission.

. **Internet**
   - Planning, creating and delivering.

Unit–2: Creative Contributions of the Key People 12+8

- **Film:** Contributions made by Writer, Director, Producer, Actor, Cinematographer, Audiographer, Editor, Art Director, Music composer.
- **TV:** Contributions made by Writer, Director, Producer, Actor, Cinematographer, Audiographer, Editor, Art Director, Music composer.
- **Print:** Contributions made by Reporter, Sub-editor, Editor.
- **Radio:** Contributions made by artist, speaker, interviewer, recordist, programme producer, station director.
- **Internet:** Contributions made by writer, conceptualizer, editor, designer.

Unit–3: Production Skills 24+16

Creating Content

Fiction

- Developing an idea into a story through synopsis, treatment and screenplay.
- Understanding the basic concepts like plot, characters, dramatic structure.
- Developing the idea in terms of theme, characters, the basic conflict.
- Narrating your story using visuals.
- Screenplay as distinct from other forms of writing (short stories, novels, plays).

Non-Fiction

- Developing an idea into a script for a documentary through synopsis, treatment and screenplay.
- Understanding the basic concepts like synopsis, research, sequencing of ideas.
- Understanding documentary techniques like interviewing, voiceover.

The production process

- Understand the Production Process by executing two Projects by means of Digital still cameras.

Project-1: Fiction

- Develop an idea into a story by using twenty five still pictures at the most.
- Design Record edit sound for the same and present it in a PowerPoint presentation of the duration of between two and three minutes maximum.

Project-2: Non-Fiction

- Develop an idea into a Non- Fiction Presentation by using twenty five Still pictures at the most.
- Design a record that edits sound for the same and present it in a PowerPoint Presentation of the duration of between two and three minutes maximum.
- Post-production Process: Post-production work of the above projects in editing and sound.

Unit–4: Role of Advertising in Mass Communication — 6+4

- The need for Advertising and Advertising as an engine of growth.
- Types of Advertising: product services, classified, public services, industrial, corporate.
- Understanding an advertising campaign.
- Principles of Advertising and Code of Advertising standards.

CLASS–XII
ELECTIVE
UNDERSTANDING THE EVOLUTION AND FORMS OF MASS MEDIA (738)
THEORY + PRACTICAL

Time: 3 Hours + 2 Hours — ***Theory: 60 Marks*** / ***Practical: 40 Marks***

Unit–1: Understanding the Language of the Medium — 24+16

Chapter–1: Media Literacy

- Introduction to Media Literacy.
- Introduction to Mass Media.
- Audience Theories.
- Media Ownership.
- Media Representation.
- Media & Violence.

Chapter–2: Aspects of Film Language

- The concept of missing scene.
- Film Analysis:
  1. Short film – fiction.
  2. Short film – non-fiction.
  3. Feature film.

Chapter–3: Content Analysis of TV Programmes

- The concept of a soap opera – Daily soap, Weekly soap, Genres of Soap Opera.
- Primary audience of each genre, the segmented nature of the audience.
- Gaze of the audience, concept of a flow, continuous interruption.

- Culture of Film based programmes.
- Culture of Music based programmes.
- Educational TV, Non-fiction on TV.

Chapter–4: Content Analysis of Radio programmes

- News- the format, the language, frequency talks, magazine programmes – unidirectional nature.
- Feedback with a time phase difference.
- Dramas - the unique nature of radio plays.
- Interactive programmes-phone in, live interaction, music, experiences, memories as content of these programmes.

Chapter–5: Content Analysis of Newspapers and Periodicals

Newspapers:

- The macro composition of a daily – various sections like the front page, edit page, sports page, business page.
- The micro composition of a daily – proportion of visual and text, language, highlighting.

Periodicals:

- The macro composition of a periodical-various sections like the cover page, cover story, features, columns, business page.
- The micro composition of a periodical–proportion of visual and text, language, highlighting.

Chapter–6: Features of the Internet

- **Emails**: Personal, business communication between individuals and organizations, changing characteristics of the same.
- **Websites**: Educational sites, Entertainment sites, Information sites, Social networking sites, Business sites.
- **Blogs.**
- **Web Advertising.**
- The changing nature of communication and perception of interpersonal and social communication due to the various developing possibilities of the Internet.

Unit–2 : Evolution of the Media [Global] 24+16

Chapter–1: The Evolution of International Cinema

The Silent Era [1895t o 1927].

- Primitives and Pioneers in UK, France and USA.
- Establishment of Hollywood, D.W Griffith and Slap stick comedy.
- Expressionism in Germany.
- Socialist Realism in USSR.

The Sound Era [1927 to the present day, transition from black and white to colour].

- The British, American and European documentary movement.
- Genres in Hollywood.
- Neorealism in Italy.

- The decade of Classical Cinema 1950-1960.
- European Cinema.
- Asian Cinema.
- African Cinema.
- Latin American Cinema.
- Post- Globalization– Hollywood and other cinemas.

Chapter–2: The Evolution of International Television

- Early beginnings from 1926.
- Post World War II.
- Commercial transmission- Local networks.
- National and trans-national networks.
- Live and recorded transmission.
- Video and Cable Networks.
- Satellite communication.
- Evolution of Fiction and Nonfiction programmes.
- Television as a part of the Internet.

Chapter–3: The Evolution of Print Medium

- Journalism as a 17^{th} and 18^{th} century phenomenon.
- Role of Industrial Revolution in the spread of print media.
- Local newspapers, Chain of newspapers.
- Some features of Journalism in Europe and America.
- On line editions.

Chapter–4: The Evolution of Radio

- Technically a combination of wireless and telegraph technology.
- Bell, Marconi, Jagdish Chandra Bose, Tesla created the possibilities of transmission.
- From Military use to the Civil one in the 1920s.
- Establishment of BBC in 1922, also Federal Commission in USA.
- News and commercial messages.
- By 1940 a universal and round the clock companion.
- 1955 onwards the invention of the transistor making radio portable.
- National/Regional Network: AM, FM, Stereo Broadcasts.
- Radio as a part of web communication.

Chapter–5: Evolution of the Internet

- The internet becomes are reality in the1970s.
- Till 1991, internet is limited to the military and industrial circles and is closed to others.
- Development of WWW in 1991 opens up internet.
- The phenomenal growth after that.

Unit–3: Convergence of the Media 12+8

Chapter–1: Independence and Inter-Convertibility of the Media

- Nature of audio-visual signals and messages - Optical/Electronic.
- Live/Recorded.
- Analogue/Digital.
- Nature of media - Print - Text.
- Film: Optical Image.
- Television: Electronic Image: Radio- wireless communication.
- Accommodation of text, sound, image into Film.
- Accommodation of Film into Television.
- Internet as the meeting point of all the mass media.

Chapter–2: Convergence and the New Possibilities of Communication

Earlier models of communication.

- Broadcasting.
- Mass communication model of a few transmitting to a vast number of receivers.
- Gigantic organization.
- Huge technical infra-structure.
- Large scale revenue.

The changed paradigm due to the Internet.

- Empowering an individual to post data on the Internet.
- Information, message in one medium triggering off activity in the others.
- Many sources of the same information.
- Distribution of the information between individuals on an unprecedented global scale.
- Rapidity of opinion generation on a local, national and global scale.
- The socio-political implications of the new information order.
- The strengthening of democracy.

CLASS–XII
ELECTIVE
THE CREATIVE AND COMMERCIAL PROCESS IN MASS MEDIA (739)
THEORY + PRACTICAL

Time: 3 Hours + 2 Hours ***Theory: 60 Marks***
Practical: 40 Marks

Unit–1: Graphic Design-Multimedia Applications Theory: 30

Chapter–1:

- Introduction to multimedia.

Chapter–2:

- Text.

Chapter–3:

- Still image.

Chapter–4:

- Video Applications.

Chapter–5:

- Sound.

Chapter–6:

- Creating a Multimedia project.

Unit–2: Production Skills

Practical: 40

Chapter–1:

- Project Tour of the campus of a training institute with some practical experience/ observation.

Chapter–2:

- Project – Non-Fiction.

Unit–3: Selling/Marketing/Exhibiting A Product Through Advertising: The Case Study Approach

Theory: 30

Chapter–1: Profile of a Product

- Product specifications.
- Targeted.
- Buyers.

Chapter–2: The Task of Advertising

- Promotion of product.
- Drive sales.
- Build a brand identity.
- Increase the buzz.

Chapter–3: The Available Media

- Print-newspapers, magazines, brochures, fliers, sposters.
- OOH-bill boards kiosks trade shows events.
- Broadcast advertising – Radio TV Digital Internet + Mobile.
- 'In film' promos.
- Celebrity endorsements.
- Cross promotions.
- Merchandise.
- Games (Mobile and computer) Covert advertising.

Chapter–4: Forms of Advertising

- Product Advertising.

- Institutional Advertising (Corporate).
- Social Service - PSA Advocacy Advertising.
- Comparative Advertising Cooperative Advertising Direct Mail.
- A Point-of-Purchase Advertising.
- Informational Advertising.

LIST OF RECOMMENDED BOOKS

1. Understanding the Evolution of Forms of Mass Media, Class XI, Published by CBSE.
2. The Creative & Commercial Process in Mass Media-I, Class X, Published by CBSE.
3. Understanding the Evolution of Forms of Mass Media, Class XI, Published by CBSE.
4. The Creative & Commercial Process in Mass Media-II, Class XII, Published by CBSE
5. Media and Social Inequality: Innovations in Community Structure Research by John Pollock.
6. Mass Media, An Aging Population, and the Baby Boomers By Michael L. Hilt, Jeremy H. Lipschultz.
7. Media Piracy in Emerging Economies by Joe Karaganis.
8. Broadcasting, Voice, and Accountability by Steve Buckley.
9. Media, Technology, and Society: Theories of Media Evolution by Russell Neuman.

Annexure–1

APPLICATION FORMAT FOR OFFERING VOCATIONAL SUBJECT / COURSES AT SENIOR SECONDARY LEVEL

1. **Name of the Course(s) applied for:** .....
   (with subject codes) .....
   .....
   .....

2. **Name of the School (Complete address)** .....
   (Also provide Website address if available) .....
   .....
   .....

3. **Affiliation No.** .....
4. **School ID.** .....
5. **Name of the Principal** .....
   - Phone No. .....
   - Mobile No. .....
   - E-mail .....
6. **Infrastructure** .....
   No. of Students .....
   No. of Teachers .....
   Student-Teacher Ratio .....
   No. of Classrooms .....
   Books in Library .....
   Total Computers in Computers Labs .....
   Specification of Computers .....
   Details of Constructed area for .....
   Establishing Laboratories .....
7. **Name of Teachers for Vocational Course** .....
   (Qualifications) .....
   .....
   .....

8. **Details of Draft** (in favour of **Secretary, CBSE,** Payable at Delhi)

   DD No.: ..... Date: ..... **Amount** (in Digits)
   .....

   Bank Issues: ..... **Amount** (in Words)
   .....

Signature & Seal of the Principal

Note: The document complete in all respects may be sent to: **The Director (Vocational Education), Central Board of Secondary Education 2, Community Center, Preet Vihar, New Delhi-110092.**

SENIOR SCHOOL

CURRICULUM

2016-17

VOLUME-IV
(PART-5)

Agro, Production and Marketing Based Courses

CENTRAL BOARD OF SECONDARY EDUCATION
"SHIKSHA KENDRA", 2, COMMUNITY CENTRE, PREET VIHAR, DELHI – 110 301"

AGRO PRODUCTION AND MARKETING BASED COURSES

1. POULTRY FARMING
2. HORTICULTURE
3. DIARY HUSBANDRY AND DIARY TECHNOLOGY

POULTRY FARMING

Introduction

The course aims to develop human resource in the area of Poultry Farming. The knowledge imparted shall facilitate better management of poultry in scientific lines which in turn will improve their productivity.

Poultry Farming has been one of the most important subsidiary occupations of the farming community in India. Poultry Farming is a remunerative business, both in rural and urban areas due to the requirement of small space, low capital investment and quick return throughout the year. It has a significant role in the eradication of malnutrition and poverty as well as eliminating unemployment and under-employment among the rural masses. However, due to lack of modern and updated methods of farming, farmers are practicing their own way, which has been found to be unproductive and not commercially viable.

Objectives

The main objective of the course is to.

- õ Develop and strengthen Human Resource by infusing/imparting knowledge and skill in Poultry Farming.
- õ Create awareness about the opportunities of employment and livelihood in poultry sector.
- õ Impart basic knowledge and technical proficiency in poultry breeding, housing, management and nutrition.

CLASS–XI
ELECTIVE
POULTRY PRODUCTION AND BREEDING (716)
THEORY

Time: 2 Hours ***Marks: 40***

1. Indian poultry industry with reference to agricultural farming important indigenous and exotic breeds- egg-type, meat-type, dual purpose, Ducks, Turkeys and Quail, etc. External anatomy (Points of a bird) and identification. Franchise hatcheries, Organised poultry research and development farms.
2. Laws of inheritance, Autosomal and sex chromosomes. Inheritance of morphological traits – comb pattern, plumage colour, disease resistance, sex linked genes. Sexing methods, feather colour and vent sexing. Major genes and their utility in production.
3. Components of egg production – egg number, persistency, intensity, sexual maturity, egg weight, body weight, broodiness, viability, feed efficiency. Methods of mating flock mating, shift mating, pen mating. Systems of breeding-inbreeding, cross-breeding, strain-crossing and hybridization.
4. Factors affecting fertility and hatchability. Pedigree hatching and commercial hatching.
5. Modern breeding methods for the production of commercial layers and broiler chicks. Quail, Duck and Turkey, etc.
6. Selection and culling of birds. Measures of egg production- hen housed and hen-day production. Efficiency of egg-production and factors affecting egg production. Production under summer stress-feed consumption, egg weight and egg quality.
7. Importance of artificial insemination in fowl methods of semen collection and insemination of hen. Precautions in semen collection and insemination. Time of insemination, concentration of sperms per insemination, frequency of insemination and their influence on fertility rate. Effect of season on semen production and fertility – Semen evaluation, Formation of egg-yolk, albumen and shell.

Note: Number in Parenthesis indicates suggestive teaching hours for the section.

PRACTICAL

Time: 3 Hours ***Marks: 60***

1. Study of external anatomy- parts of body.
2. Study of characters of egg type breeds of fowl.
3. Study of characters of meat type breeds of fowl.
4. Study of breeds of ducks, turkey and quail.
5. Study of commercial poultry stocks.
6. Sketching of important poultry pockets in India (showing breeding farms, hatcheries, etc. in the map of India).
7. Exercise on the inheritance of morphological traits.
8. Identification of sex, feather sexing and colour sexing method.
9. Vent sexing.
10. Identification of birds-wing bands (sketch of wing band), application of wing bands, wing badges and leg bands.
11. Drawing of egg production curves based on data.
12. Record keeping of egg weight at various ages.
13. Calculation of feed efficiency per Kg. in terms of eggs and feed requirements per dozen eggs.
14. Drawing of a sketch of various types of cross breeding and strain crossing.
15. Marking eggs for pedigree hatching and hatching of pedigree chicks.
16. Calculation of hatchability of fertile and total eggs set basis.
17. Culling non-layers.
18. Calculation of hen-housed and hen-day egg production.
19. Judging bird for egg production- comb size and colour, bones, distance body conformation and body capacity.
20. Filling pedigree records – sire family and dam family for hatching, egg production, body weight and egg weight.
21. Study and sketching of various types of trap nests.
22. Trap nesting and study of defects in trap nests.
23. Identification of pedigree in cage birds.
24. Study of male and female reproductive organs.
25. Artificial insemination in fowl.
26. Preparation of male for semen collection – collecting funnels – training of males, preparation pfr A.I. Kit, semen evaluation.

CLASS–XI
ELECTIVE
POULTRY HOUSING AND MANAGEMENT (717)
THEORY

Time: 2 Hours ***Marks: 40***

1. Importance and principles of poultry housing. Materials and method for poultry housing environment and poultry housing management. Housing for chicks, growers, layers and broilers.

2. Factors affecting heat loss and heat production in fowl. Methods of heat loss. Housing considerations in summer, winter, and rainy season.
3. Methods of housing – housing of chicks on floor and cages. Housing of growers in cages and floor. Housing of layers on floor and cages. Slatted floor.
4. Floor space requirements for chicks, grower, layers, and broilers, feeder and waterer space requirements for chicks, growers, layers, and broilers.
5. Equipment – brooder house equipment – floor brooders, battery brooder, chick guards, chick feeders, chick waterers.
6. Grower house equipment – grower feeders, grower waterers, grower cages.
7. Layer house equipment – layer feeders, layer waterer, nest box and grit box. Types of layer feeders, laying cages.
8. Other equipment – debeakers, balances, egg boxes and filler flats, catching crates, catching hooks, litter racker, pedigree boxes.
9. Management of chicks- chick feeding, chick watering, and debeaking. Temperature maintenance – infra red brooding, environmental problem in a poultry farm and its control, prophylactic vaccination.
10. Management of growers –grower feeding, watering and debeaking.
11. Layer management –layer feeding, watering on floor and in cages, medication, egg collection and lighting schedule.
12. Broiler management – separating sexes, lighting schedule, feeding, watering, prophylactic vaccination and medication of broilers.
13. Litter management – material, special emphasis on adverse weather conditions, racking, mixing of lime, built up litter and disposal of litter.
14. Moulting – age of moulting, process of moulting, forced moulting. Methods and precautions in forced moulting.
15. Stress management – identification of various agents causing stress.
16. Management problems –density of bird, watering and feeding space, rodent control, difficulties in poultry management.
17. Introduction to management of ducks, quails and turkeys – hatchery operations care during fumigation. Candling, setting and transferring of hatching eggs, cleaning of hatching eggs. Requirements of temperature, humidity and turning. Gaseous environment of incubator and corrective measures.

Note: Number in parenthesis indicates suggestive teaching hours for the section.

PRACTICAL

Time: 3 Hours ***Marks: 60***

1. Identification of poultry housing materials.
2. Designing and sketching of poultry house for chicks.
3. Designing and sketching of grower house on floor and in wire mesh cages.
4. Designing and sketching of layer house on floor and in cages.
5. Visit to a poultry farm.
6. Preparation of tables for space, feeder and waterer requirement of birds of various ages.
7. Drawing sketches of floor brooder, battery brooder, chick feeder, chick waterer and brooder guards.
8. Arranging waterers, feeders and chick guards in a brooder house.
9. Identification of equipment for infra-red brooding.
10. Recording of temperature.
11. Drawing sketch and handling of a grower feeder, waterer and wire floor battery cages.

12. Drawing a sketch and handling automatic water arrangement in cages.
13. Drawing a diagram and handling of nest box and grit box.
14. Debeaking of birds.
15. Drawing a diagram of debeaked chick and debeaked adult bird.
16. Drawing a sketch and handling of catching crate, catching hooks, litter racker and pedigree boxes.
17. Identification of filler flats – paper pulp, plastic.
18. Drawing of egg boxes.
19. Drawing of chick box.
20. Drawing and handling of bamboo, wooden and metal transport crates.
21. Cooling poultry house in summer, through water spraying, side curtains, straw thatching, etc.
22. Identification of feather of fowl-primary, secondary and body feather. Sketching sequence of falling of feather in moulting.
23. Preparation of birds for show purposes and visit to poultry exhibition.
24. Hatchery showing location of hatching equipment.
25. Cleaning and fumigation of hatching eggs, setting, candling and transferring of eggs.
26. Distinguishing between fertile and infertile eggs.
27. Recording of temperature, humidity and turning in hatchery.
28. Drawing a chart for common defects in operation of hatcher and setter and their remedial measures.
29. Drawing a sketch of wing feather showing slow and rapid feathering.
30. Drawing a sketch of cloacal opening to differentiate between male and female protuberance.
31. Setting a chick sexing room, bulbs, reflector, chick boxes, etc.

CLASS–XI
OPTIONAL
POULTRY EXTENSION, MARKETING AND ECONOMICS (718)
THEORY

Time: 2 Hours ***Marks: 40***

1. Extension Education –Principles of extension technique. Poultry extension – objectives and its role in poultry development programmes. Qualities of extension worker different poultry development programmes, their impact and future strategy.
2. Extension methodology and techniques. Handling audio-visual aisa and their importance in poultry education programmes. Methods of effective communication.
3. Rural sociology- its impact, social institutions and their role in poultry development concept of socio-economic cultural change.
4. Nature and importance of marketing. Marketing process, communication media, methodology of survey and their assessment. Adoption process and factors influencing adoption.
5. Marketing channels for poultry and poultry products. Marketing societies and farmers co-operatives.
6. Formation of poultry co-operative societies – their objectives and impact on social structure.
7. Salesmanship, qualities of a salesman. Advertising agencies and their role in acceptability of poultry products.
8. Pricing, demand and supply and its relationship with pricing. Effect of season.
9. Economics of egg production. Economic of broiler production. Factors affecting economic returns.`

10. Economics of poultry production and its relationship with national economy. Benefits and limitation of poultry farming.
11. The role of poultry products sale points in efficient marketing.
12. Poultry farm records, inventory receipt and expenditure.
13. Specific forms for maintaining feed, flock, strength, mortality, incubation, performance and health records.
14. Accountancy financial statement of profit and loss. Model scheme for setting up of a layer/broiler farm of various sizes.
15. Importance of poultry insurance. Financial institutions involved in support of poultry programme.

Note: Number in parenthesis indicates suggestive teaching hours for the section.

PRACTICAL

Time: 3 Hours ***Marks: 60***

1. Preparations of communication materials such as posters, charts, bulleting, boards and films.
2. Handling of audio-visual aids.
3. Organization of poultry exhibition in rural and urban areas.
4. Conducting group discussions, meetings to educate village farmers and arranging demonstrations.
5. Familiarizing with local marketing channels of poultry and poultry products.
6. Preparation of a flow diagram showing steps required for formation of co-operative societies.
7. Calculation of economics of broiler production.
8. Calculation of economic of cockerel production.
9. Calculation of cost of preparation of egg and meat products.
10. Study of registers and accounts.
11. Preparations of insurance schedule.

CLASS–XII
ELECTIVE
POULTRY NUTRITION AND PHYSIOLOGY (716)

THEORY

Time: 2 Hours ***Marks: 40***

1. Biology of fowl, digestive physiology - digestion, absorption & utilization of feed nutrients carbohydrates, proteins, fat vitamins and trace elements. Factors affecting digestibility and feed efficiency. **13**

   Importance of nutrition in poultry production-classification of food stuffs and their categorization in to energy feeds, protein feeds, minerals and vitamins. Feed additives. Agre - industrial by- products and non-conventional feeds.

2. Nutrient requirements of different types of poultry-chick grower, layer and broiler, ducks, turkeys and quails. Assessing their requirements. Selection of feed, and BIS feeding standards for poultry. **9**
3. Preparation of poultry rations. Proximate analysis of various categories of poultry feed. Advantages and disadvantages of mash and pelleting feed. Feeding methods of poultry. Feeding schedules for various types of poultry. Common nutritional deficiencies in poultry rations. Common toxic principles in poultry feeds and method of detoxification. **10**

4. Use of non-conventional poultry feed ingredients. Principles of storage of feeds and maintenance of stores. Nutritional factors affecting fertility. Role of hormones and effects of light on growth and reproduction. Stress physiology and remedial measures. **8**

Note: Number in parenthesis indicates suggestive teaching hours for the section.

PRACTICAL

Time: 3 Hours ***Marks: 60***

1. Identification of various poultry ingredients and their classification.
2. Familiarization with feed additives, agro- industrial by –products and micro nutrients.
3. Identification of common feed adulterants.
4. Sampling and labelling of poultry feeds.
5. Acquaintance with various laboratory equipment and apparatus.
6. Preparation of various laboratory reagents and standard solutions used in feed analysis.
7. Determination of moisture/ dry matter.
8. Determination of proteins.
9. Determination of crude fibre.
10. Determination of ash.
11. Preparation of analytical report.
12. Mixing of chick starter, grower, layer and broiler ration.
13. Use of feed concentrates foe preparation of carious mashes.
14. Calculation of feed requirements of chicks, growers, layers and broilers according to age.
15. Calculation of feed efficiency for meat production.
16. Calculation of feed efficiency for meat production.
17. Calculation of deed requirements for production of one kg. egg mass and dozens of eggs.
18. Preparation of mineral mixture.
19. Physical evaluation of grains and other feed components.
20. Identification and application of insecticides, fumigants and rodenticides in feed go down.
21. Sketching of digestive tract of fowl.
22. Sketching of endocrine organs.
23. Sketching respiratory organs.
24. Sketching of circulatory system.
25. Sketching of renal organs.
26. Sketching of nervous system.

CLASS–XII
ELECTIVE
POULTRY PRODUCTS AND TECHNOLOGY (717)

THEORY

Time: 2 Hours ***Marks: 40***

1. Present status of poultry products technology in India and its scope for expansion and future development. Structure, chemistry, per capita consumption of poultry and egg in India and abroad including changing consumer attitude towards these items. Egg and poultry meat as a source of quality animal protein. Sources of contamination of egg. and its products and its prevention. **5**

2. Egg quality and its maintenance. Importance of egg quality studies and techniques available to evaluate the same Factors responsible for deterioration of egg quality. Microbial spoilage of eggs. Methods of preservation of shell eggs.

   5

3. Handing, collection, grading, packaging and storage of eggs. Organisations and operation of cold stores for holding shell eggs and its products. **10**

   Functional properties of eggs. Pasteurization, freezing and dehydration of egg products, including their packaging and storage. Principles and techniques of manufacture of egg powder, albumen flakes, yolk granules and other edible egg products. Industrial use of egg and egg products. National and international standards for egg and egg products, Microbial spoilage of eggs.

4. Principles of dressing poultry including chilling, packing and labelling. Meat yield, meat cutting and factors influencing meat yield- comparative evaluation of various types of avian species used in India for purposes of meat. Different methods of preservation of poultry meat- chilling, freezing, curing, smoking, dehydration and canning. Microbial spoilage of poultry meat and its prevention. **12**

5. Inspection, grading and standardization of dressed poultry. Fundamentals and principles of further processed poultry products. Specifications and regulations relating to poultry products offered for sale Sanitation in poultry processing plant and egg breaking unit. Selection of types of detergents and sanitizers. Sampling technique and quality control of egg and poultry products. Packaging transportation and marketing of egg and poultry products.**8**

Note: Number in parenthesis indicates suggestive teaching hours for the section.

PRACTICAL

Time: 3 Hours ***Marks: 60***

1. Structural details and internal parts of an egg.
2. Composition and nutritive value of different types of avian eggs.
3. Measurement of external and internal physical quality of eggs.
4. Identification of quality defects in eggs.
5. Candling and grading of eggs.
6. Washing of eggs.
7. Coating of eggs.
8. Spraying of eggs for preservation.
9. Preservation of eggs by different techniques.
10. Preparation of cold store and its operation during storage and removal for disposal.
11. Packing of shell eggs for short and long term transport.
12. Preparation of various edible egg products.
13. Ante- mortem examination of birds.
14. Dressing of chicken and ducks.
15. Evaluation of dressing yield, meat yield and dressing loss of chicken and ducks.
16. Preparation of cut up parts of chicken and ducks.
17. Chilling, packing and storage of dressed chicken.
18. Grading of dressed chicken.
19. Preparation of tandoori chicken.

20. Preparation of chicken pickle.
21. Preparation of smoked chicken.
22. Preparation of chicken sausage.
23. Preparation of chicken curry.
24. Preparation of chicken patties.
25. Sampling of meat and egg. Products.
26. Organoleptic evaluation of chicken and egg products.
27. Sanitary practices in a poultry and egg breaking plant.
28. Visit to poultry processing plants to get familiar with their organisation, layout and operation.
29. Marketing methods for disposal of egg and poultry products- by visiting different marking units.

CLASS–XII
OPTIONAL
POULTRY DISEASE AND THEIR CONTROL (718)
THEORY

Time: 2 Hours ***Marks: 40***

1. Definition of health and disease – signs of health in flock. Principles of hygiene- use of detergents in spraying and cleaning of sheds. Importance of sanitation in hatchery building, hatchers and setters. Role of intermediate hosts in spread of diseases. Pre- disposing factors for sickness- faulty feeding practices, poor ventilation, lack of cleanliness, overcrowding, attendant, precautions to avoid infection. **5**
2. Common diseases of poultry and their causative agents. Symptoms and treatment. **15**
   - õ **Viral Diseases:** Ranikhet diseases, fowl pox, EDS -76 (egg drop syndrome), infectious bursal diseases (Gumboro diseases) infectious bronchitis, infectious Laryngo Tranchitis, inclusion body hepatitis, avian encephalomyelitis, Reoviral arthritis, marek's disease, avian lymphoid leukosis.
   - õ **Bacterial Diseases:** coli bacillosis, infectious coryza, salmonellosis, pasteurel lososs pirochetosis, mycoplasmosis, tuberculosis.
   - õ **Fungal Diseases:** Aspergillosis and aflatocicosis.
   - õ **Parasitic Diseases:** Ectiparasistes – line, mites, ticks and fieas: Endoparasties – rounf worm tape worm and protozoan diseases – coccidiosis.
3. Miscellaneous diseases: Staphyococccosis, cannibalism, pilling of birfs, egg bound condition, proapa of the uterus, cage layer fatigue. Sofuum chloride poising. Stunting syndrome, tumors. Diseases of duck, quinea fowl, turkeys and quail Nutritional deficiencies –polyneuritis, curried toe paralysis, encephalomalacia, rickets, perosiisnad other nutritional diseases. **12**
4. Principle of immunity, immunization and control of infectious diseases such as Ranikhet disease, marek's disease, fowl pox, infectious bronchitis. Immunity periods after vaccination. Precautions at vaccination time. Preparation and storage of vaccines Deworming and control of parasitic diseases and routine treatment methods.**8**

Note: Number in parenthesis indicates suggestive teaching hours for the section.

PRACTICAL

Time: 3 Hours ***Marks: 60***

1. Identification of healthy and sick birds.
2. Recording of temperature.
3. Visual appraisal of comb, buccalcavity, gait and behaviour.

4. Demonstration of terms: bacteria, virus, protozoa, fungus, sulphonamides, antibiotics, Antibodies, antigens, active immunity, passive immunity, acute and chronic diseases, pathogens, vaccines, virulence, morbidity, mortality.
5. Visit to poultry farm showing equipment, position of foot bath. Sterilization and sterilization methods.
6. Preparation of chart for common viral diseases, showing the causative agents, symptoms, prophylactic vaccinations and treatment.
7. Preparation of chart for common bacterial and fungal diseases, showing their causative agents. Symptoms, vaccination and treatment.
8. Preparation of figure of life cycle of coccidial agents. Symptoms and treatment.
9. Control of Ecto – parasites – dipping methods, spraying with insecticides
10. Identification of common insecticides used in poultry and their use.
11. Deforming of poultry birds.
12. Preparation of table common nutritional diseases- their causes, symptoms and treatment.
13. Preparation of vaccines and their preservation.
14. Vaccination poultry birds.
15. Study of internal organs of the body of the fowl.
16. Collection of blood, separation of serum an plasma and preservation.
17. Preparation of blood smear and tissue impression smear and staining.
18. Post- mortem examination for important poultry diseases.
19. Collection of infected material, preservation, packing and despatching to diagnostic laboratory
20. Fumigation of hatchery and eggs.
21. Visit to a disease diagnostic laboratory.

HORTICULTURE

Introduction

Horticulture is associated with the cultivation of vegetables, fruits, flowers, crops, tuber crops and medicinal, aromatic and ornamental plants where one can attain knowledge about crop production, plant propagation, plant breeding, genetic engineering, preparation of soil and plant physiology and biochemistry and simultaneously can work in various fields including floral design, garden centers, teaching, fruit and vegetable production, arboriculture, landscape construction, etc.

The Course Curriculum of Horticulture is focused to create interest among the students to identify and grow a wide range of different plants of commercial and medicinal use. It will enable the students to learn, how to interpret and understand a range of different habitats from woodlands and grassland to coastlines, to carry out wildlife surveys, undertake a range of countryside skills such as dry-stone walling and hedge-laying and to supervise a team carrying out a habitat regeneration project. The course on Horticulture is effectively designed to build the skills and knowledge of the students so as to equip them to work in the Conservation and Environment sectors. Further, it is intended to lay a foundation for a long-term career in horticulture by developing the ability of the students to identify a large range of plants, your knowledge of essential horticultural principles and practices, your practical skills in plant propagation, growth and care, and your ability to adapt to changing situations.

CLASS–XI
ELECTIVE
BASIC HORTICULTURE (762)
THEORY

Time: 3 Hours ***Marks: 60***

1. Importance of Horticultural crops.
2. Principles of Horticulture crop production technology.
3. Principles of plant propagation, methods of propagation for horticultural crops.
4. Essential of plant nutrients, their deficiency symptoms and toxicities in Horticultural crops.
5. Organic and inorganic manures and their methods of application in Horticultural crops.
6. Principles of weed control, crop rotation, cropping system, methods of irrigation and drainage.
7. Major pest and diseases management in horticultural crops.
8. Harvesting, handling, storage.
9. Traits and quality standards of horticultural products.

PRACTICAL

Time: 2 Hours ***Marks: 40***

1. Visit to a Garden/orchard/vegetable farm .
2. Identification of major fruit crops of our country.
3. Identification of major vegetable crops (*Kharif / Rabi / Zaid*) of our country.
4. Identification of major flower crops of our country.
5. Identification of ornamental/avenue/lawn (grasses, hedge, edge) plants of our country.
6. Identification of indoor and outdoor foliage ornamentals (succulent, bulbous etc.).
7. Propagation through seeds .
8. Propagation through cutting- Sucker, Layering (air & ground), Runners and grafting
9. Preparation of pot for planting- Cleaning, Media Preparation, Filling.
10. Identification of different Fertilizers- NPK.
11. Identification of organic Manures- FYM, vermin compost, Cakes, Bone meal.
12. Preparation of model of a low cost storage structure for horticultural produce.

CLASS–XI
OPTIONAL-I
OLERICULTURE (763)

THEORY

Time: 3 Hours ***Marks: 60***

1.	Important vegetable crops - present status and future prospects.	**4**
2.	Selection of site and soil for growing vegetables.	**5**
3.	Role of environment and soil factors in vegetable production.	**5**
4.	Essential plant nutrients and their deficiency symptoms.	**4**
5.	Vegetable crops management.	**5**
6.	Classification of vegetable crops.	**4**
7.	Production technology of solanaceous and cucurbitaceous vegetable crops.	**8**
8.	Training and pruning in tomato and cucurbits under open field conditions.	**4**
9.	Vegetative and reproductive propagation methods in vegetable crops.	**4**
10.	Role of growth regulators in vegetable crops.	**4**
11.	Management of important insect-pests and diseases of vegetable crops.	**4**
12.	Application of biotechnology in vegetable production.	**4**
13.	Maturity traits, quality standards of fresh vegetables and their post-harvest handling.	**5**

PRACTICAL

Time: 2 Hours ***Marks: 40***

1.	Visiting vegetable gardens, identification of vegetable crops with reference to stage of crop growth, flowering and marketable stage of the vegetables.	**3**

2. Land preparation and sowing of vegetable crops. **2**
3. Preparation of nursery beds for raising vegetable seedlings. **2**
4. Visit to local vegetable nursery and acquaintance with different nursery management practices. **2**
5. Identification of important vegetable crops at different growth stages on the basis of different morphological traits. **2**
6. Identification of seeds of vegetable crops. **2**
7. Calculation of seed requirement for important vegetable crops. **2**
8. Protecting plants from sub-optimal temperature conditions to cultivate off-season vegetables. **2**
9. Methods of irrigation and drainage for the cultivation of vegetable crops. **2**
10. Identification of organic manures and chemical fertilizers. **2**
11. Calculation of the doses of fertilizers as per the recommendation for a particular vegetable crop. **2**
12. Identification of deficiency symptoms of nutrients in vegetable crops. **2**
13. Identification of common weeds in vegetable gardens and preparation of herbarium. **2**
14. Controlling weeds in gardens through manual and chemical methods. **2**
15. Identification of different types of mulches and their application in vegetable crops. **2**
16. Methods of training and pruning of tomato and cucumber crop. **2**
17. Preparation of stecklings of root vegetables and their planting for seed production. **2**
18. Seed production technology of cucurbits. **2**
19. Visit to local market for identification of vegetable crops. **2**
20. Identification of common tools and equipments used for the cultivation of vegetable crops. **1**

CLASS–XI
OPTIONAL–II
POMOLOGY (764)
THEORY

Time: 3 Hours ***Marks: 60***

1. Major fruit crops, their importance present status and future prospects. **5**
2. Selection of site and soil for planting fruit orchards including fencing and wind break etc. Field preparation and layout of the orchard, planting time, selection of fruit variety, packing, transportation and marketing of propagation material and Fencing and wind break etc. **10**
3. Management of orchard such as protection of young plant, manuring and fertilizer application, irrigation and its various methods including micro irrigation techniques, intercultural operation and green manuring etc. **12**
4. Factors affecting fruitlessness/fruitfulness. **5**
5. Growth and bearing habits of major fruit crops such as banana, papaya, mango, apple, citrus, pineapple, grapes, strawberry, walnut etc. **6**
6. Manipulation of growth & development of fruit plants by training and pruning of fruit plants, (special horticultural practices such as ringing, bending, notching, thinning, root pruning etc.) and use of growth regulators in fruit crops for flowering and fruit set. **12**
7. Climate change and fruit crops, climatic fruit zones of India, effects of climatic factors such as soil, temperature, rain, relative humidity, sunshine etc. on growth, development and fruiting and effect of adverse climatic conditions such as frost, cyclone, flood, heavy rainfall, drought and protection against them. **5**
8. Application of biotechnology in fruit production. **5**

PRACTICAL

Time: 2 Hours ***Marks: 40***

1.	Visiting orchards identification of fruit plants with reference to stage of crop growth, flowering and fruit bearing habit.	**2**
2.	Getting acquaintance with live and non-live fencing and studying their methods of establishment.	**2**
3.	Identification of plants for wind breaks in orchards.	**1**
4.	Preparation of field /soil and layout of orchards, digging pits and filling.	**2**
5.	Visiting nursery and observing selection of a plant material, lifting, packing and transportation.	**3**
6.	Pre-planting care of planting materials after removal from nursery with special reference to healing removal of wilted damaged and dead parts.	**3**
7.	Studying different planting techniques.	**2**
8.	Protecting plants from low temperature, smudging or creating smoke and providing shade during winter.	**3**
9.	Draining out excess water from orchard and observing effect of water stagnation on fruit crops.	**2**
10.	Irrigation of orchard.	**1**
11.	Identification of manures (organic, bio-fertilizers and inorganic).	**1**
12.	Identification of deficiency symptoms of nutrients in fruit crops.	**2**
13.	Intercultural operations in orchards.	**2**
14.	Controlling weeds in orchard through manual and chemical methods.	**2**
15.	Preparation of herbarium of weeds of orchard.	**2**
16.	Identification and applying different kinds of mulches in orchard.	**2**
17.	Methods of training and pruning of fruit crops.	**2**
18.	Identification and locating water suckers/sprouts/shoots in citrus and banana.	**1**
19.	Bending, notching, thinning, and ringing in fruit crops wherever applicable.	**2**
20.	Identifying and analyzing the unfruitful fruit trees and its causes.	**2**
21.	Identification of common tools and equipment's for fruit crops.	**1**

CLASS–XI
OPTIONAL–III
FLORICULTURE (765)
THEORY

Time: 3 Hours ***Marks: 60***

1.	Importance and scope of Floriculture and Landscaping: Present status and future prospects.	**3**
2.	History of gardening in India.	**3**
3.	Types and styles of gardens.	**2**
4.	Principle and elements of landscaping.	**5**
5.	Important annual and perennial flower crops.	**5**
6.	Principles and methods of propagation of ornamental crops.	**5**
7.	Commercial seed production in Flower Crops.	**5**

8. Essential plant nutrients, their deficiency symptoms, toxicities, organic and inorganic manures and fertilizers for floricultural crops. **5**
9. Application of biotechnology in flower crops. **5**
10. Protected cultivation of commercial flower crops. **5**
11. Concept of xeriscaping, water scaping, interior scaping, roof gardening, terrace gardening and vertical gardens. **5**
12. Pest and disease management in flower crops. **2**
13. Post Harvest management of Flower crops. **5**
14. Value addition in flowers crops. **5**

PRACTICAL

Time: 2 Hours ***Marks: 40***

1. Identification of ornamental trees, shrubs, climbers and bulbous plants.
2. Preparation of herbarium of different ornamentals.
3. Laying out nursery for different seasonal flower crops.
4. Land preparation for flower crops directly raised through seeds.
5. Preparation of nursery beds and field preparation for planting flower seedlings.
6. Identification of propagules likes seeds, bulbs, tubers, rhizomes, etc.
7. Preparation of different type of cuttings for the propagation of carnation, chrysanthemum, bougainvillea etc.
8. Identification of manures and fertilizers and calculation of these as per recommended dose for the flower crops to be planted.
9. Identification of deficiency symptoms of nutrients in flower crops.
10. Identification of common tools and equipment used for cultivating flower crops.
11. Use of different irrigation methods in flower crops.
12. Controlling weeds in gardens through manual and chemical methods.
13. Identification and applying different kinds of mulches in the gardens.
14. Seed production of flower crops like marigold, pansy, petunia, antirrhinum etc.
15. Visit to local flower market.
16. Identification of important insect, mites', nematodes and other diseases (viral, bacterial and fungal).
17. Preparation of pesticide solution and their safe application.

CLASS–XI
GENERAL FOUNDATION COURSE (501)

Time: 3 Hours ***Marks: 100***

Part–I: (Compulsory to all Vocational Courses) ***Marks: 50***

A. Business Management and Entrepreneurship **30**

(a) **Entrepreneurship Orientation** **5**
Importance and relevance in real life: Emphasis on self employment.

(b) **Entrepreneurship Values and Attitudes** **5**
Innovativeness, Independence, Risk Taking, Analytical ability.

(c) **Entrepreneurial Motivation** **5**
Achievement Planning, personal efficacy, entrepreneurial goal setting.

(d) **Launching of a Business Venture** **15**
Identification of project, steps in setting up a business, information about various institutions providing assistance, project formulation.

B. Computational Skills **10**

(a) Percentage, ratio & proportion, profit & loss, discount, simple and compound interest, population growth and depreciation of value of articles using logarithm. **6**

(b) Area and volume: rectangle, parallelogram, circle, cube, cone, cylinder & sphere. **4**

C. Environmental Education **5**

(a) Environment and the society.

(b) Environment properties risks in different economic enterprises, in use of raw materials, in processing / manufacturing and designing.

(c) Poverty and environment.

D. Rural Development **5**

(a) Agriculture, the back bone of Indian Economy.

(b) Rural development projects in India including Integrated rural development programme.

(c) Agro based rural industries.

(d) Community approach to rural development.

Part-II *Marks: 50*

1. Branches, scope and importance of horticulture. **6**
2. Principles of establishing orchard, soil texture, soil structure, soil fertility & soil productivity tillage and tillage operations. **10**
3. Essential plant nutrients major and minor-their deficiencies & toxicities, organic and inorganic manures and fertilizers. **10**
4. Principles of weed control, crop rotations, multiple and intercropping and drainage. **7**
5. Principles of propagation, seed production, integrated pest & disease management. **7**
6. handling, storage and quality of horticultural products. **6**
7. Importance or rural forestry. **4**

CLASS–XII
ELECTIVE
BASIC HORTICULTURE (762)
THEORY

Time: 3 Hours *Marks: 60*

1. Business opportunities in horticulture. **6**
2. Principles of preservation and value addition of Horticultural Produce (Fruits, Vegetables and flowers). **15**
3. Types of syrup, brines and food colour used in preservation of fruits, vegetables and flowers. **4**
4. Urban Horticulture. **8**
5. Weeds of horticultural crops and their management. **5**

6.	Methods of propagation of horticultural crop.	**15**
7.	Planting material for horticultural crops.	**7**

PRACTICAL

Time: 2 Hours ***Marks: 40***

1.	Visit to a processing plant.	**3**
2.	Visit to a fruit, vegetable and a flower market.	**3**
3.	Harvesting, safe plucking & storage of fruits.	**6**
4.	Identification of food colours.	**2**
5.	Primary Processing (including Cleaning and Sorting/Grading) and preservation of fruits (Including drying and addition of preservatives).	**4**
6.	Identification of different preservatives and preparation of syrups and brines.	**5**
7.	Identification and taste of different value added products of fruits and vegetables such as Jams, Jellies, Squash, Pickles, candies, canned item packs.	**4**
8.	Identification of common weeds of orchards and vegetable farms.	**3**
9.	Visit to a tissue culture laboratory.	**5**
10.	Harvesting and Primary processing of flowers.	
11.	Identification of flood arrangements such as Bouquets, Rangoli, Garland, Ikebana etc.	**5**

CLASS–XII
OPTIONAL–I
OLERICULTURE (763)

THEORY

Time: 3 Hours ***Marks: 60***

1.	Different production system and modern methods of vegetable cultivation.	**10**
2.	Industrial importance of vegetable and setting up of industry based on the vegetable crops.	**5**
3.	Cropping system with vegetable crops.	**10**
4.	Production technology of important vegetable crops.	**15**
5.	Fertigation in vegetable crops.	**5**
6.	Role of chemicals and growth regulators in vegetable production.	**5**
7.	Seed production techniques of vegetable crops.	**5**
8.	Hybrid seed production of vegetable crops, An entrepreneurship opportunity.	**5**

PRACTICAL

Time: 2 Hours ***Marks: 40***

1.	Visit to vegetable field to study methods of vegetable cultivation.	**4**
2.	Identification of vegetable seeds and vegetable crops at different growth stages.	**4**
3.	Determining the germination percentage of vegetable seed.	**2**
4.	To study vegetable treatment with fungicide and bacterial culture.	**2**
5.	Studying vegetables classification according to economic parts used.	**1**

6.	Preparing vegetable nursery beds.	**2**
7.	Raising vegetable seedling in nursery bed and protrays.	**2**
8.	Identification of major diseases and insect-pests of vegetables.	**2**
9.	Preparation for sowing/transplanting of vegetable crops.	**2**
10.	Sowing/transplanting of vegetables in main field.	**2**
11.	Fertilizer application for vegetable growing.	**2**
12.	Preparation of pesticide solutions and its spray in vegetable crops.	**2**
13.	Preparation of processed products from vegetables.	**2**
14.	Breaking dormancy to induce germination in potato.	**2**
15.	Hybrid production technology of tomato.	**2**
16.	Use of protected structures for vegetable cultivation.	**2**
17.	Harvesting indices, grading and packaging of vegetables.	**2**
18.	Calculating cost of production of important vegetable crops.	**1**
19.	Visit to vegetable based industry.	**2**

CLASS–XII
OPTIONAL–II
POMOLOGY (764)

THEORY

Time: 3 Hours ***Marks: 60***

1. Importance of fruit culture (economic preposition, health benefits etc.) Setting up of industry based on the fruits present position and scope of fruit processing and equipments required for setting up a processing unit. **6**
2. Cultivation of temperate of fruits (apple, pear, plum, peach, apricot, walnut, almond). **5**
3. Cultivation of tropical fruits (mango, banana, papaya, sapota, pineapple etc.). **5**
4. Cultivation of sub–tropical fruits (pomeranate, litchi, citrus, grapes, ber, aonpla etc.) their Cultivation of temperature fruits (apple, pear, plum, Alume, Peach, apricot, walnut, almond) cultivation practices with special reference to origin, varieties (cultivars, climate, soil, land preparation, planting, manuring, irrigation, harvesting, ripening of fruits, grading, packaging, marketing) control of insect pest and diseases. **4**
5. Root stocks of different fruit crops, their propagation, nursery management. **4**
6. Management of rootstocks and mother stocks. **3**
7. Fertigation in fruit crops. **4**
8. Maturity standards, harvesting, ripening, grading of fruits etc. **6**
9. Mechanized harvesting of fruits. **6**
10. Role of biotechnology and micro–propagation of importance fruits crops. **5**
11. Pesticide use, safety of operators and consumers, concept of minimum residue limit in fruits crops. **5**
12. Orchard rejuvenation, head back and high density planting in fruits. **3**
13. Packing, storage and value addition and value added products from fruits. **4**

PRACTICAL

Time: 2 Hours ***Marks: 40***

1. Visit to high density orchard, identification of fruit trees and varieties.
2. Studying fruit setting and fruit dropping in important fruits crops.
3. Laying out different systems of irrigation for young and adult fruit trees in orchard.
4. Planting of fruit trees such as papaya, citrus, mango etc.
5. Mulching in fruit orchard (plastic and biological).
6. Performing intercultural operation in orchard.
7. Selecting at least two fruit species and maintaining them from flowering till fruiting.
8. Training and pruning of available trees.
9. Training in grapes on head and bower system, if available.
10. Training in mango and pomegranate.
11. Notching and pruning in fig/gular.
12. Foliar application of nitrogenous fertilizer in fruit crops.
13. Manuring with farm yard manure and chemical fertilizer in fruit crops.
14. Observing declines in the orchards and study their causes.
15. Studying morphological characteristics of available varieties of fruit crops available in your locality.

16. Identification of important insects and other pests and diseases of fruit crops.

17. Preparation of pesticide solutions and their safe spraying in orchard.

18. Evaluating the taste of fruit cultivars.

- õ Identification of fruit trees & verities.
- õ Identification of important diseases of fruit crops.

19. Calculating the cost of production of important local fruit crops.

20. Visit to local fruit market and Studying marketing of fruit and finding out scope of different fruit in the local market.

21. Studying the use of Gibberellin Acid and other growth promoting hormones in orchards.

22. Orchard rejuvenation – making rings, application of fertilizers, root pruning etc.

CLASS–XII
OPTIONAL–III
FLORICULTURE (765)
THEORY

Time: 3 Hours ***Marks: 60***

1.	Present scenario and scope of floriculture in global market.	**8**
2.	Employment avenues in floriculture sector.	**9**
3.	Study of outdoor room concept: public area, private area and service area.	**9**
4.	Different features of gardens like gate, walls, arches, pergolas, paths, roads, edges, hedges, stepping stones, sun dial, bird bath, statues, water fountain, lawns, herbaceous borders, bonsai, topiary etc.	**9**
5.	Concept of CAD (Computer aided designs) for landscape designs.	**4**
6.	Methods of establishing lawns and their management including irrigation, fertilization, mowing, insect-pest and diseases and their control.	**3**
7.	Production of indoor plants and their maintenance.	**2**
8.	Commercial cultivation of rose, chrysanthemum, gladiolus, marigold, tuberose, jasmine and crossandra.	**2**
9.	Protected cultivation of commercial flower crops like rose, carnation, chrysanthemum, gerbera, orchids, antirrhinum etc).	**2**
10.	Flower arrangements: types and styles.	**5**
11.	Methods of dry flower making like air drying, embedded drying, water drying, press drying, glycerin drying, freeze drying etc. and other value added products.	**4**
12.	Post-harvest handling of commercial flower crops including harvesting, pre cooling, pulsing, holding, dry and wet storage, packing, packaging and transportation.	**3**

PRACTICAL

Time: 2 Hours ***Marks: 40***

1. Visit to flower market during different seasons.
2. Performing intercultural operations like training, pruning in roses.
3. Performing staking, pinching, de-shooting and disbudding in carnation and chrysanthemum flower crops.
4. Maintenance of mother plants of chrysanthemum.
5. Embedded drying of important flower crops using different embedding media.

6. Studying morphological characteristics of available varieties of flower crops available in your locality.
7. Identification of important pests and diseases of lawn and avenue plants.
8. Preparation of pesticide solutions and their spraying for control of insect, pests and diseases.
9. Preparation of dry flower products like greeting cards, book marks, wall hangings and dry flower baskets.
10. Preparation of landscape designs for school and college using CAD technology.
11. Preparation of landscape designs for home gardens.
12. Preparation of landscape designs for public parks.
13. Preparation of different flower arrangements like ikebana, garland, bouquets etc.
14. Calculating the cost of production of important flower crops.
15. Packing and packaging of commercial flower crops.

CLASS–XII
GENERAL FOUNDATION COURSE (501)

Time: 3 Hours ***Marks: 100***

Part–I: (Compulsory to all Vocational Courses) *Marks: 50*

A. Business Management and Entrepreneurship 30

Management of Business

Elementary treatment/exposure to basic conceptual frame work of the topic listed below:

(a)= Basic Function. **6**

(b) Marketing Management. **6**

(c) Financial Management. **6**

(d) Production Management. **6**

(e) Personnel Management. **6**

B. Computational Skills 10

1. (a) Solution of linear equations and their application to problem of commercial mathematics. **5**

   (b) System of linear equations and in equation in two variables. Applications in formation of simple linear programming problems.

2. Statistics: Raw data, bar charts and Histogram; Frequency Tables; Frequency Polygon; Ogive; Menu, Median and Mode of ungrouped and grouped data; Standard Deviation; Introduction to Mortality tables; Price Index etc. Introduction to Computers. **5**

C. Environmental Education & Rural Development 10

1. **Environmental Education** **5**

   (a) Modernisation of agriculture and environment, irrigation, water logging, use of fertilisers, pesticides, soil erosion, land degradation (desertification and deforestation), silting and drying of water resources.

   (b) Rational utilisation, conservation and regeneration of environmental resources (soil, air, water, plant, energy, minerals).

2. **Rural Development** **5**

   Principles and goals of rural development, major problems/constraints in rural development in India.

Part-II *Marks: 50*

1. Principles of vegetable cultivation, soil and site selection in vegetable cultivation. **10**
2. Importance of ornamental gardening principles of garden making. Weed control in vegetable and flower gardens. Seed production of seasonal flowers. **15**
3. Principles of post harvest technology. Principles of processing and preservation of fruits, vegetables and flowers. **10**
4. Types of syrups, brines, preservatives used in preservation process. Use of food colours. **10**
5. Importance of Horticultural products in human diet. **5**

LIST OF RECOMMENDED BOOKS

1. Pomology–I, Student Handbook for Class–XI, Published by CBSE.
2. Pomology–II, Student Handbook for Class–XII, Published by CBSE.
3. Basic Horticulture–I, Student Handbook for Class–XI, Published by CBSE.
4. Basic Horticulture–II, Student Handbook for Class–XII, Published by CBSE.
5. Floriculture–I, Student Handbook for Class–XI, Published by CBSE.
6. Floriculture–II, Student Handbook for Class–XII, Published by CBSE.
7. Basic Horticulture–I, Student Handbook for Class–XI, Published by CBSE.
8. Pomology–I, Practical Manual for Class–XI, Published by CBSE.
9. Pomology–II, Practical Manual for Class–XII, Published by CBSE.
10. Basic Horticulture–II, Practical Manual for Class–XII, Published by CBSE.
11. Olericulture–I, Student Handbook for Class–XI, Published by CBSE.
12. Olericulture–II, Student Handbook for Class–XII, Published by CBSE.
13. Olericulture–I, Practical Manual for Class–XI, Published by CBSE.
14. Olericulture–II, Practical Manual for Class–XII, Published by CBSE.
15. Floriculture–II, Practical Manual for Class–XII, Published by CBSE.
16. A Handbook of Floriculture, S. Prasad & U. Kumar.
17. Objective Horticulture Knowledge, Salaria.
18. Fundamentals of Garden Designing, Roy, Rup Kumar.
19. Horticulture at a Glance - III Floriculture, Landscape Gardening, Medicinal & Aromatic Plants, Dr. Ajeet Singh Salaria & Dr. Babita Singh Salaria.
20. A Handbook of Soil, Fertilizer and Manure, Prof. P.K.Gupta.
21. Advances in Horticulture-Strategies, Production, Plant Protection, Value Addition, Dr. V.K. Sharma.
22. Advances & Challenges In Agricultural Extension & Rural Development, Dr. T. Rathakrishnan, Dr. M. Israel Thomas & Dr. L. Nirmala.
23. Postharvest Technologies for Commercial Floriculture, Verma, Anil.
24. Breeding, Biotechnology and Seed Production of Field Crops, Bidhan, Asit K. Basu & Asit B. Mandal.
25. Adoption of New Technology - Production, Efficiency and Agrarian Relations, Bhagaban Swain.

SUGGESTED LIST OF EQUIPMENTS, APPARATUS AND IMPLEMENTS

(For a Group of 20-25 students)

S. No.	Name	Qty. No.	S. No.	Name	Qty. No.
1.	Khurpi	20	39.	Measuring jugs (500 ml)	5

S. No.	Name	Qty. No.	S. No.	Name	Qty. No.
2.	Sickle	20	40.	Hindaliumpateelas (big) with lid.	5
3.	Ironpeg	20	41.	Hindaliumpateelas (medium) with lid.	5
4.	Spade	20	42.	Wooden spoons	5
5.	Handrake	20	43.	Steelpateelas (with lids)	5
6.	Handhoe	20	44.	Craters	5
7.	Digging fork	10	45.	Knives	10
8.	Secateur	20	46.	Peelers	20
9.	Cutting knife	20	47.	Lemon squeezes	20
10.	Budding knife	20	48.	Stainless steel strainers	5
11.	Grafting knife	20	49.	Soup strainers	5
12.	Budding and grafting knife (Combined)	10	50.	Steel thali	5
13.	Pruning knife	5	51.	Pressure cooker	5
14.	Watering can with hose	10	52.	Wooden paltas/kadchies	5
16.	Grasss hear	5	53.	Funnels	20
17.	Tasla	10	54.	Class jars	20
18.	Trenching trowel	5	55.	Glass bottles	20
19.	Balti (Bucket)	10	56.	Jam bottles	20
20.	Trenching hoe	5	57.	Wax	5 kg
21.	Grass cuttings word	5	58.	Bottles with crown caps	250
22.	Transplanting trowel	20	59.	Ordinary cork	200
23.	Pruning saw	5	60.	Sealing machine	2
24.	Treepruner	2	61.	Brushes for cleaning bottles	10
25.	Marking rope	5	62.	Glass tumblers	2
26.	Measuring tape	5	63.	Quarter plates	20
27.	Axe	2	64.	Teaspoons	20
28.	Glass containers	10	65.	Tablespoons	10
29.	Hosepipe for irrigation	200 m	66.	Serving spoons	10
30.	Lawn mower	1	67.	Gas lighter	2
31.	Sprayer	1	68.	Enamelled plates (big)	10

S. No.	Name	Qty. No.	S. No.	Name	Qty. No.
32.	Duster	1	69.	Enamelled bowls	10
33.	Wheel barrow	2	70.	Frying pans	5
34.	Cooking tables	3	71.	Tawas	2
35.	Juicer	2	72.	Poni	5
36.	Weighing machine Dial type)	5	73.	Karchi	5
37.	Spring balance	2	74.	Steel jugs	5
38.	Measuring jugs (1000 ml)	5	75.	Sieves	17

DAIRY HUSBANDRY AND DAIRY TECHNOLOGY

Introduction

Dairy Technology intends to educate about the methods of handling milk from production and consumption to processing, packaging, storage, transport and physical distribution to the students. The prime objective here is to create interest among the aspiring students about the prevention of spoilage, improvement of milk- quality, increasing the shelf-life of milk and making milk palatable and safe for further human consumption.

With the spectacular growth of the dairy industry in the last two decades, the demands for indigenous production of dairy equipment, increased quality standards and production of varieties of milk products has gained momentum simultaneously. The present course curriculum is concerned to develop trained man power in dairying technology at the grass root level so as to meet the challenges at national and international requirement. The focus of dairy technology course ranges from the role of dairy farming in Indian economy to developing the present technology as an aid in giving employment opportunities to youth. The present course curriculum will give insight knowledge in to the students about animal breeding and artificial insemination, common terms used in animal husbandry and dairying, dentition and age determination, important Indian an dexotic breeds of dairy cattle and buffaloes including cross breeds and their identification, production, planning and management of dairy farms.

DAIRY HUSBANDRY (CLASS–XI)
SCHEME OF STUDIES

Subjects

Language
Biology
Physics
Chemistry
Milk Production
Animal Nutrition and Reproduction

CLASS–XI
ELECTIVE
MILK PRODUCTION (758)
(DAIRY HUSBANDRY)
THEORY

Time: 3 Hours ***Marks : 60***

1. Dairy Development in India: Dairying - Present status, Future prospectus, its role in Indian Economy, livelihood security; Important Government initiatives/schemes (Operation flood, ICDP). Features of Operation Flood programme and the impact of operation Flood and other schemes on dairy Development, New policies/schemes and initiatives/incentives (National Dairy Plan), important dairy development organizations/Institutions (NDDB,

NDRI, IVRI, NABARD. AMUL, International dairy Federation, etc.) and their role in dairy development, Concept of socio economic and cultural change, Different livestock farming systems.

2. Dairy Cooperatives: Co-operative movement, Definition, principle and advantages of cooperatives, Cooperative structure for dairy sector (Functions, Structure, ANAND Pattern) and National Milk Grid, Organization of milk co-operatives, functions structure and functions of primary co-operative society, district unions, co-operative federations. Functions of milk co-operative secretary. Maintenance of registers and records, New Generation Cooperatives (NGC).
3. Milk Production: Important Dairy Breeds (Cattle, Buffalo, Goat), Body parts of dairy animals, Breeding systems (Crossbreeding, Grading Up), Artificial Insemination, Common terminologies (economic/production, species-wise terminologies), judging and selection of dairy animals, factors affecting milk production.
4. Clean Milk Production: Udder Structure, milk secretion and let down, Milking methods/management, Clean milk production -Concept, Definition, Significance, Constraints, Factors affecting quality of Milk, Measures to be taken for clean milk production.
5. Milk Procurement: Surveys for milk potential area for surplus. Different milk procurement systems. Pricing policy of milk and milk products. Importance of dairy animal insurance. Collection, preservation and transport of milk to chilling point. Different methods of chilling and storage of milk. Financial institutions involved in support of dairy programmes.
6. Extension methods and techniques. Handling of Audio visual aids, and their importance in dairy extension work. Criteria for selection of methods, and their use for effective teaching e.g. in AI etc. Nature and importance of communication, communication process, problems in communication.

PRACTICAL

Time: 2 Hours ***Marks: 40***

1. Recognition of different breeds of cows, buffaloes and goats.
2. External anatomy of cow, buffalo and goat.
3. Identification of the animals.
4. Visit to an Animal Farm.
5. Visit to Procurement Centers and other milk shed areas.
6. Maintenance of registers and accounts.
7. Calculation of milk payment based on fat and two axis pricing policy of Dairy Cooperative Society (DCS).
8. Designing milk routes based on data.
9. Preparation of ledger, trial-balance and balance-sheet of DCS.
10. Milking of dairy Animals.
11. Reception, weighment and sampling of milk.
12. Sampling of milk and milk products for microbiological and chemical analysis.
13. Preservation of milk samples for chemical analysis.
14. Sensory evaluation of milk.
15. Gerber fat test for milk.
16. Determination of specific gravity of milk by lactometer.
17. Determination of titra table acidity in milk.
18. Case study of a milk co-operative society and dairy entrepreneur.
19. Study of transport and chilling and storage of milk at farm level.
20. Visit a nearby milk union/dairy and prepare a checklist of problems in procurement and milk distribution.

21. Preparation of extension teaching materials such as posters, charts, bulletins, boards and others.
22. Organization of an exhibition and cattle show with emphasis on Dairy and Animal Husbandry.
23. Conducting group discussions: meetings in the villages, demonstration in the villages.

CLASS–XI
ELECTIVE
ANIMAL NUTRITION AND REPRODUCTION (759)
(DAIRY HUSBANDRY)

THEORY

Time: 3 Hours ***Marks: 60***

1. Classification of nutrients - water, carbohydrates, proteins, lipids, minerals, and Vitamins; Role of different nutrients in animal's growth, production, reproduction and health.
2. Anatomy of digestive system of dairy animals; Digestion, absorption and utilization of different nutrients.
3. Common feeds and fodder used in dairy animals; Classification of feeds and fodders - Concentrates (energy and protein), Roughages (Dry and succulent), unconventional feeds, feed additives, feed supplements, Composition of commonly used feeds and fodders with respect to energy and protein contents.
4. Packages of practices for production of different fodders soils type, land preparation, crop selection, cultivation practices, crop rotation, irrigation and harvesting; Agro forestry, silvipasture.
5. Feed processing and fodder conservation - Importance of processing of feed, compounding of feed - milling, grinding, mixing, pelleting etc.; Conservation of fodder - hay, silage, straw, stover; Methods of making Hay and silage.
6. Feed Formulation - Nutrient requirement for different category of dairy animals, Balanced/complete ration, Methods of feed formulation.
7. Feeding of dairy animals - Principles of feeding in dairy animal, Feeding of different categories of dairy animals *viz.* new-born calf, growing calves, heifers/bull-calves, pregnant, lactating, dry cows and bulls; feeding during extreme weather conditions and feed/fodder scarcity, requirements of water for different category of dairy animals.
8. Metabolic disorders & deficiency diseases in dairy animals - Bloat, mineral and vitamin deficiency diseases.
9. Anatomy of male and female reproductive system.
10. Basic concepts of animal reproduction - Puberty, sexual maturity, oestrus cycle, oestrus length, Gametogenesis (production of male and female gametes), ovulation, Fertilization, embryogenesis, gestation and parturition.
11. Importance and role of hormones involved in animal reproduction - FSH, LH, estrogen, progesterone, testosterone, oxytocin, prostaglandin etc.
12. Distress/Heat Detection.
13. Artificial Insemination.
14. Breeding Calendar, Gestation, length in different Dairy Animals, Pregnancy Diagnosis & Record Keeping.
15. Common Reproductive Disorders in Dairy Animals..

PRACTICAL

Time: 2 Hours ***Marks: 40***

1. Collection and identification of common feeds and fodders.
2. Proximate analysis of feed: dry matter, nitrogen, crude fibre, ether extract and total ash.

3. Grinding and mixing of feed ingredients.
4. Hay and Silage making.
5. Preparation of calf starter.
6. Preparation of concentrate mixtures using Pearson square method.
7. Preparation of mineral mixture.
8. Computation of ration for different categories of farm animals.
9. Calculation of feed and fodder requirements using Thumb rule method for various categories of dairy animals *viz.,* growing, heifers/bull calves, bulls, pregnant, lactating and dry cows.
10. Feeding and watering of calves, heifers, pregnant and lactating cows and bulls.
11. Visits to feed laboratory and cattle feed manufacturing plant.
12. Drawing and labeling of male and female reproductive organs of dairy animals.
13. Demonstration of semen collection and evaluation.
14. Detection of estrous/heat through visual examination.
15. Visit to veterinary hospital/AI centre for demonstration of Artificial Insemination.
16. Different equipments used in Artificial Insemination.
17. Care, sterilization, storage and upkeep of AI equipments.
18. Preparation of AI Gun.
19. Thawing of semen straw and loading in insemination gun.
20. Preparation of heat expectancy chart and expected calving calendar.
21. Maintenance of AI records.

CLASS–XI
ELECTIVE
MILK PRODUCTION (760)
(DAIRY TECHNOLOGY)
THEORY

Time: 3 Hours ***Marks: 60***

1. Dairy Development in India: Dairying - Present status, Future prospectus, its role in Indian Economy, livelihood security, Important Government initiatives/schemes (Operation flood, ICDP). Features of Operation Flood programme and the impact of operation Flood and other schemes on dairy Development, New policies/schemes and initiatives/incentives (National Dairy Plan), important dairy development organizations/Institutions (NDDB, NDRI, IVRI, NABARD. AMUL, International dairy Federation, etc.) and their role in dairy development, Concept of socio economic and cultural change, Different livestock farming systems.
2. Dairy Cooperatives: Co-operative movement, Definition, principle and advantages of cooperatives, Cooperative structure for dairy sector (Functions, Structure, ANAND Pattern) and National Milk Grid, Organization of milk co-operatives, functions structure and functions of primary co-operative society, district unions, co-operative federations. Functions of milk co-operative secretary. Maintenance of registers and records, New Generation Cooperatives (NGC).
3. Milk Production: Important Dairy Breeds (Cattle, Buffalo, Goat), Body parts of dairy animals, Breeding systems (Crossbreeding, Grading Up), Artificial Insemination, Common terminologies (economic/production, species-wise terminologies), judging and selection of dairy animals, factors affecting milk production.

4. Clean Milk Production: Udder Structure, milk secretion and let down, Milking methods/ management, Clean milk production – Concept, Definition, Significance, Constraints, Factors affecting quality of Milk, Measures to be taken for clean milk production.
5. Milk Procurement: Surveys for milk potential area for surplus. Different milk procurement systems. Pricing policy of milk and milk products. Importance of dairy animal insurance. Collection, preservation and transport of milk to chilling point, Different methods of chilling and storage of milk. Financial institutions involved in support of dairy programmes.
6. Extension methods and techniques. Handling of Audio visual aids, and their importance in dairy extension work. Criteria for selection of methods, and their use for effective teaching e.g. in AI etc. Nature and importance of communication, communication process, problems in communication.

PRACTICAL

Time: 2 Hours ***Marks: 40***

1. Recognition of different breeds of cows, buffaloes and goats.
2. External anatomy of cow, buffalo and goat.
3. Identification of the animals.
4. Visit to an Animal Farm.
5. Visit to Procurement Centers and other milk shed areas.
6. Maintenance of registers and accounts.
7. Calculation of milk payment based on fat and two axis pricing policy of Dairy Cooperative Society (DCS).
8. Designing milk routes based on data.
9. Preparation of ledger, trial-balance and balance-sheet of DCS.
10. Milking of dairy Animals.
11. Reception, weighment and sampling of milk.
12. Sampling of milk and milk products for microbiological and chemical analysis.
13. Preservation of milk samples for chemical analysis.
14. Sensory evaluation of milk.
15. Gerber fat test for milk.
16. Determination of specific gravity of milk by lactometer.
17. Determination of titratable acidity in milk.
18. Case study of a milk co-operative society and dairy entrepreneur.
19. Study of transport and chilling and storage of milk at farm level.
20. Visit a nearby milk union/dairy and prepare a checklist of problems in procurement and milk distribution.
21. Preparation of extension teaching materials such as posters, charts, bulletins, boards and others.
22. Organization of an exhibition and cattle show with emphasis on Dairy and Animal Husbandry.
23. Conducting group discussions: meetings in the villages, demonstration in the villages.

CLASS–XI
ELECTIVE
FLUID MILK PROCESSING (761)
(DAIRY TECHNOLOGY)

THEORY

Time: 3 Hours ***Marks: 60***

1. Milk: Composition, Milk constituents, Composition of milk from different species, colostrum, physico-chemical properties, factors affecting composition and physico-chemical properties, nutritive value.
2. Quality of milk: Grading, dye detection test, platform test, sensory evaluation, milk and public health, common milk-borne diseases, spoilage, causes and prevention, adulterants and their detection.
3. Reception of milk at milk dock: Sampling and testing (chemical, microbiological) at dairy plant, milk chilling and storage.
4. Market Milk: TM, DTM, SPM, RRM, Flavoured Milk and Fortified Milk, Fluid Milk Varieties & Special Milks.
5. Cream separation: objective, principle, method, equipments and efficiency testing.
6. Clarification: objective, principle, method, equipments and efficiency testing.
7. Pasteurization: objective, principle, method, equipments and efficiency testing.
8. Homogenization: objective, principle, method, equipments and efficiency testing.
9. Sterilization: objective, principle, method, equipments and efficiency testing.
10. Cleaning and sanitization of dairy equipment, CIP.
11. Effluent treatment and dairy plant waste disposal.
12. Dairy utilities: steam, water, ice, refrigeration/freezing, electricity.
13. Packaging: Packaging materials and specifications, machines, systems, operational aspects.
14. Dispensing fluid milk through bulk vending, bottles, carton and pouches.

PRACTICAL

Time: 2 Hours ***Marks: 40***

1. Reception of milk at Dairy Cooperative Society, Dairy Plant, Chilling centre.
2. Platform Tests for milk.
3. Straining, filtration & clarification of milk.
4. Chilling & storage of milk.
5. Study of cream separator.
6. Study of can washer.
7. Standardization of Milk.
8. Study of Batch Pasteurizer and High Temperature Short Time (HTST) Pasteurizer.
9. Pasteurization of milk.
10. Determination of efficiency of Pasteurization.
11. Study of Homogenizer, Homogenization of Milk and Determination of Homogenization Efficiency.
12. Study of Milk Sterilizer, Sterilization of Milk and Determination of Homogenizer Efficiency.
13. Sterilization study of Packaging system of milk.
14. Preparation of flavored milk, reconstituted milk, TM and DTM.
15. Cleaning and sanitization of equipment.
16. Design and Layout of a dairy plant.

CLASS–XI
GENERAL FOUNDATION COURSE (501)

Time: 3 Hours *Marks: 100*

Part–I: (Compulsory to all Vocational Courses) *Marks: 50*

A. Business Management and Entrepreneurship 30

(a) **Entrepreneurship Orientation** **5**
Importance and relevance in real life: Emphasis on self employment.

(b) **Entrepreneurship Values and Attitudes** **5**
Innovativeness, Independence, Risk Taking, Analytical ability.

(c) **Entrepreneurial Motivation** **5**
Achievement Planning, personal efficacy, entrepreneurial goal setting.

(d) **Launching of a Business Venture** **15**
Identification of project, steps in setting up a business, information about various institutions providing assistance, project formulation.

B. Computational Skills 10

(a) Percentage, ratio & proportion, profit & loss, discount, simple and compound interest, population growth and depreciation of value of articles using logarithm. **6**

(b) Area and volume: rectangle, parallelogram, circle, cube, cone, cylinder & sphere. **4**

C. Environmental Education 5

(a) Environment and the society.

(b) Environment properties risks in different economic enterprises, in use of raw materials, in processing / manufacturing and designing.

(c) Poverty and environment.

D. Rural Development 5

(a) Agriculture, the back bone of Indian Economy.

(b) Rural development projects in India including Integrated rural development programme.

(c) Agro based rural industries.

(d) Community approach to rural development.

Part-II *Marks: 50*

1. History and scope of Dairying in India. **6**
2. Role of dairy farming in Indian economy and mixed farming practices in India - their advantages and limitations. **7**
3. Dairying as an aid in giving employment opportunities to youth. **7**
4. Layout of dairy farm/plant. Factors involved in profitable dairying. **7**
5. Points of animal body and external anatomy. Common terms used in animal husbandry and dairying, dentition and age determination. **8**
6. Identification marks on animals: tattooing, branding, tagging and notching. **7**
7. Important Indian and exotic breeds of dairy cattle and buffaloes including cross breeds and their identification. **8**

CLASS–XII
ELECTIVE
MANAGEMENT OF DAIRY ANIMALS (758)
(DAIRY HUSBANDRY)

THEORY

Time: 3 Hours ***Marks: 60***

1. Care and management of different dairy animals - newborn, young/heifers, growing, dry, milch, pregnant animals, bull/bullock and sick animals. **3**
2. Routine manage mental. **3**
3. Record keeping - different records in a dairy farm and its maintenance. **3**
4. Principles and design of animal housings, location and layout of animal sheds. **3**
5. Housing of dairy animals - Conventional and loose housing, space requirements of different category of animals. **4**
6. Layout and designing of animal house/farm. **3**
7. Protection from extreme environmental conditions - bedding, sprinkling/wallowing etc. **4**
8. Cleaning and sanitation of dairy farm and equipments. **3**
9. Common instruments/equipments used in the dairy farm. **3**
10. Farm waste collection, utilization and disposal. **3**
11. Biogas production and vermicomposting. **3**
12. Signs of health - difference between healthy and sick animals, Normal physiological parameters - temperature, respiration and pulse rate. **4**
13. Common diseases - infectious/contagious, bacterial/viral/fungal/parasitic, Causes, mode of transmission and common signs/symptoms. **4**
14. Prevention and control of diseases - vaccination, de worming, quarantine etc. **3**
15. Culling, quarantine, disposal of dead animals, placenta, animal discharges etc. **4**
16. Biotechnology in dairy health, production and reproduction (I). **4**
17. Application of Biotechnology in health, production and reproduction (II). **3**
18. Development of transgenic dairy animals and dairy animal's genomics. **3**

PRACTICAL

Time: 2 Hours ***Marks: 40***

1. Approaching, Handling and restraining of animals.
2. Casting of a dairy animal.
3. Identification of dairy animal by tattooing/branding/tagging.
4. Determination of age by dentition.
5. Determination of body weight by formula method.
6. Care and management of calf.
7. Dehorning/disbudding of calf.
8. Castration in dairy animals.
9. BCS in dairy animals.
10. Grooming and washing of animals.
11. Cleaning and sanitation of farm and milking equipments.
12. Drawing of sketch of floor plan for different animal houses.
13. Designing of biogas plant.
14. Observing signs of health in a dairy animal.

15. Determination of pulse, respiration rate and body temperature.
16. Observing and identifying symptoms of certain specific diseases in animals.
17. Visit to a veterinary hospital for demonstration of identification of common diseases of dairy animals.
18. Routine farm operations.
19. Visit to dairy farm.
20. Annexure I (Basic Information).

CLASS–XII
ELECTIVE
MILK MARKETING AND ENTREPRENEURSHIP (759)
(DAIRY TECHONOLOY)

THEORY

Time: 3 Hours ***Marks: 60***

1. Milk Marketing: Marketing - definition, systems, channels, entrepreneur - small scale - selection of site for dairy farm, agencies providing financial assistance/incentives, government schemes. **15**
2. Dairy Farm Management: Milk Losses, Managing Productivity, Human Resource Requirements for a Dairy Farm. **15**
3. Entrepreneurship and Organization Building: Entrepreneurial skills and delegation, Development of business plan Managing and operating a small business, Evaluation of small enterprise. **15**
4. Food Safety and Quality Management: New Food Safety Act and Regulations, rule & regulation governing dairy industry, Evaluation of small enterprise, Protocols to strengthen quality control management system, good manufacturing practices, good hygienic practices and HACCP, Laboratory equipment and instruments. **15**

PRACTICAL

Time: 2 Hours ***Marks: 40***

1. Familiarization with laboratory equipment and instruments.
2. Listing of quality control agencies at national level and international level.
3. Standards specification (chemical and microbiological) of milk and milk products.
4. Determination of fat in all dairy products.
5. Identification of sources for milk losses during processing of milk and preparation of milk products; Preparation of check list for controlling the losses.
6. Identification of parameters for production efficiency.
7. Identification of entrepreneurial skills.
8. Prepare a project report to set up milk parlour/a small dairy plant.
9. Prepare a questionnaire to assess strength and weakness of any milk or milk product marketing by a nearby milk union or a dairy and also administer it.
10. Preparation of check-list to study problems and constraints in procurement and distribution of milk.

CLASS–XII
ELECTIVE
DAIRY PRODUCTS TECHNOLOGY (760)
(DAIRY TECHONOLOGY)

THEORY

Time: 3 Hours ***Marks: 60***

1. Composition, standards, Manufacturing - process and equipments and defects during manufacturing and storage of Cream, Butter, Ghee, Khoa, Channa, Paneer. **12**
2. Composition, standards, Manufacturing - process and equipments and defects during manufacturing and storage of Curd/Dahi, youghurt, chakka, shrikhand, Cheese. **12**
3. Composition, standards, Manufacturing - process and equipments and defects during manufacturing and storage of softy, ice-cream, Kulfi. **12**
4. Composition, standards, Manufacturing - process and equipments and defects during manufacturing and storage of dried and condensed milk products (milk powder - skim milk, whole milk, whitener, condensed milk). **12**
5. Composition, standards, Manufacturing - process and equipments and defects during manufacturing and storage of dairy by-products (skim milk, casein, caseinate, whey - concentrate, powder, lactose, ghee residue). **12**

PRACTICAL

Time: 2 Hours ***Marks: 40***

1. Visit to dairy plant: Ghee refinery, Butter Manufacturing unit, Powder plant, cheese factory, Ice cream unit, casein making unit.
2. Demonstration of manufacture of products in laboratory/ at dairy plant/ through video aids - Cream, Butter, Ghee, Khoa, Channa, Paneer, Curd/Dahi, Yoghurt, Chakka, Shrikhand, Cheese, Ice-cream, Kulfi, Dried and condensed milk products: Milk powder - skim milk, whole milk, whitener, condensed milk and dairy by-products (skim milk, casein, caseinate, whey - concentrate, powder, lactose, ghee residue).
3. Sensory Evaluation of milk products.

CLASS–XII
ELECTIVE
MILK MARKETING AND ENTREPRENEURSHIP (761)
(DAIRY TECHONOLOGY)

THEORY

Time: 3 Hours ***Marks: 60***

1. Milk Marketing: Marketing - definition, systems, channels; entrepreneur - small scale - selection of site for dairy farm, agencies providing financial assistance/incentives, government schemes. **15**
2. Dairy Farm Management: Milk Losses, Managing Productivity, Human Resource Requirements for a Dairy Farm. **15**
3. Entrepreneurship and Organization Building: Entrepreneurial skills and delegation, Development of business plan Managing and operating a small business, Evaluation of small enterprise. **15**
4. Food Safety and Quality Management: New Food Safety Act and Regulations, Rule & regulation governing dairy industry, Evaluation of small enterprise, Protocols to strengthen Quality control management system, Good manufacturing practices, good hygienic practices and HACCP, Laboratory equipment and instruments. **15**

PRACTICAL

Time: 2 Hours ***Marks: 40***

1. Familiarization with laboratory equipment and instruments.
2. Listing of quality control agencies at national level and international level.
3. Standards specification (chemical and microbiological) of milk and milk products.
4. Determination of fat in all dairy products.
5. Identification of sources for milk losses during processing of milk and preparation of milk products; Preparation of check list for controlling the losses.
6. Identification of parameters for production efficiency.
7. Identification of entrepreneurial skills.
8. Prepare a project report to set up milk parlour/a small dairy plant.
9. Prepare a questionnaire to assess strength and weakness of any milk or milk product marketing by a nearby milk union or a dairy and also administer it.
10. Market information report on different dairy products/Preparation of bankable report.

CLASS–XII
GENERAL FOUNDATION COURSE (501)

Time: 3 Hours ***Marks: 100***

Part–I: (Compulsory to all Vocational Courses) *Marks: 50*

A. Business Management and Entrepreneurship 30

Management of Business

Elementary treatment/exposure to basic conceptual frame work of the topic listed below:

(a)= Basic Function. **6**

(b) Marketing Management. **6**

(c) Financial Management. **6**

(d) Production Management. **6**

(e) Personnel Management. **6**

B. Computational Skills 10

1. (a) Solution of linear equations and their application to problem of commercial mathematics. **5**

   (b) System of linear equations and in equation in two variables. Applications in formation of simple linear programming problems.

2. Statistics: Raw data, bar charts and Histogram; Frequency Tables; Frequency Polygon; Ogive; Menu, Median and Mode of ungrouped and grouped data; Standard Deviation; Introduction to Mortality tables; Price Index etc. Introduction to Computers. **5**

C. Environmental Education & Rural Development 10

1. **Environmental Education** **5**

   (a) Modernisation of agriculture and environment, irrigation, water logging, use of fertilisers, pesticides, soil erosion, land degradation (desertification and deforestation), silting and drying of water resources.

   (b) Rational utilisation, conservation and regeneration of environmental resources (soil, air, water, plant, energy, minerals).

2. **Rural Development** **5**

Principles and goals of rural development, major problems/constraints in rural development in India.

Part-II

Marks: 50

1. General Management, principles of animals housing, layout, design and construction of economical animal houses, milking byre, calf pens and paddocks, etc. Disposal and utilisation of dung, etc. of dairy farm and hygiene/sanitation of dairy animals. **10**
2. Preparation of animals for show. **5**
3. Judging of dairy cattle and buffaloes using score card. **6**
4. Composition of milk of different animals. **5**
5. Adulteration of milk, different adulterants commonly used. **5**
6. Importance of Extension activities for dairy development. **4**
7. Functions of dairy cooperation on the pattern of National Dairy Development Board. **5**
8. Practical aspects of "Financing and related to dairy establishment. **5**
9. Importance of record keeping and accountancy in dairying. **5**

LIST OF RECOMMENDED BOOKS

1. Animal Nutrition & Reproduction, (Dairy Husbandry), Student Handbook for Class–XI, Published by CBSE.
2. Animal Nutrition & Reproduction, (Dairy Husbandry), Practical Manual for Class–XI, Published by CBSE.
3. Milk Production, (Dairy Husbandry), Student Handbook for Class–XI, Published by CBSE.
4. Milk Production, (Dairy Husbandry), Practical Manual for Class–XI, Published by CBSE.
5. Milk Production, (Dairy Technology), Student Handbook for Class–XI, Published by CBSE.
6. Milk Production, (Dairy Technology), Practical Manual for Class–XI, Published by CBSE.
7. Milk Marketing & Entrepreneurship (Dairy Husbandry) Student Handbook for Class–XII, Published by CBSE.
8. Milk Marketing & Entrepreneurship (Dairy Husbandry) Practical Manual for Class–XII, Published by CBSE.
9. Milk Marketing & Entrepreneurship (Dairy Technology) Student Handbook for Class–XII, Published by CBSE.
10. Milk Marketing & Entrepreneurship (Dairy Technology) Practical Manual for Class–XII, Published by CBSE.
11. Fluid Milk Processing, (Dairy Technology) Student Handbook for Class–XII, Published by CBSE.
12. Fluid Milk Processing, (Dairy Technology) Practical Manual for Class–XII, Published by CBSE.
13. Dairy Product Technology, (Dairy Technology) Student Handbook for Class–XII, Published by CBSE.
14. Dairy Product Technology, (Dairy Technology) Practical Manual for Class–XII, Published by CBSE.
15. Management of Dairy Animals, (Dairy Husbandry) Student Handbook for Class–XII, Published by CBSE.
16. Management of Dairy Animals, (Dairy Husbandry) Practical Manual for Class–XII, Published by CBSE.
17. A Textbook of Animal Husbandry, G. C. Banerjee, IBH Publication.
18. Livestock and Poultry Production, Harbans Singh and Moore, Prentice Hall.
19. Farm Animal Management and Poultry Production, Shastri Thomas and Singh, Vikas Publishers.
20. Approval Practicesin Dairying, Mortenson and Juergans.
21. Definition of the characteristics of cattle and buffalo breeds of India, I.C.A.R., New Delhi,1973.
22. Indian Breeds of Cattle and Buffaloes, Directorate of Extension, Ministry of Agriculture, Govt. of India, New Delhi,1976.
23. Hand Book of Animal Husbandry, I.C.A.R., New Delhi, 1978.

24. Nutritive Values of Indian Cattle Feeds and Feeding of Animals, K. C. Sen and S.N. Ray, Bull. No. 25, ICAR, New Delhi, 1971.
25. Forage Crops of India, T.R. Narayanan and P. M. Debadheo, ICAR, New Delhi, 1972.
26. Domestic Animal, Harbans Singh, National Book Trust of India, New Delhi, 1966.
27. Veterinary Medicine, D. C. Blood and J.A. Handerson, 4th edn., Villiams and Vilkins, Baltimore, 1974.
28. Livestock Breeding in India, D. Sundaresan, Vikas Publishing House Private Ltd., New Delhi, 1976.
29. Animal Nutrition and Feeding Practices in India, S.K. Ranjhan, Vikas Publishing House, New Delhi, 1976.
30. Indian Dairy Products, K. T. Acharya.
31. Dairying in India, Sukumar De.
32. Artificial Insemination in Farm Animals, E.J. Parry.
33. Reproduction in Farm Animals, E.S.H. Hefez.
34. Threogenology and reproduction in Farm Animals, C.R. Saneetal.
35. Pashupalan, Haryana School Education Board, Haryana.
36. Pashupalan, Part-I & II, ICAR, New Delhi.
37. The Fluid Milk Industry, J.S. Handerson, A.V.I. Publishing Company, West Pot, Conn., U.S.A.
38. Milk Hygiene in Milk Production Processing and Distribution, F.A.O. Publication, 1982.
39. Dairy Animal Management (Instructional-cum-Practical Manual) by NCERT, New Delhi.
40. Feeds and Feedings of Dairy Animal (Instructional-cum-Practical Manual) by NCERT, New Delhi.
41. Milk and Milk Products (Instructional-cum-Practical Manual) by NCERT, New Delhi.

SUGGESTED LIST OF LABORATORY CHEMICALS

Fertilizers, Detergents, Pesticides etc. (For a group of 25 students)

S. No.	Name of Chemical	Quantity
1.	Sulphuric acid (C. grade)	5litres
2.	Sulphuric acid(L.R.)	5litres
3.	Amyl alcohol	2 × 500 ml
4.	Sodium hydroxide (pellets)	500gms
5.	Litmus paper	Blue and red
6.	Filter paper (Whatman No. 1 & 40)	1packeteach
7.	Petroleum ether (40o-60oC)	5litres
8.	Copper sulphate	500gms
9.	Sodium sulphate	500gms
10.	Potassium dichromate	500gms
11.	Sodium bicarbonate	500gms
12.	Oxalic acid	500 gms
13.	Eosin water soluble	25gms
13.	Eosin water soluble	25gms

S. No.	Name of Chemical	Quantity
14.	Nigrosine water soluble	100gms
15.	Methyl blue	25gms
16.	Resazurin	25 gms
17.	Phenolphthalein	25gms
18.	Petroleumjelly/liquid paraffin	500gms
19.	Spirit	5 litres
20.	Mastaid solution	55ml
21.	Sodium citrate	500 gms
22.	Glucose	500 gms
23.	Sulphanilamide	100 gms
24.	Penicillin G-Sodium	5 × 1 gm
25.	Streptomycin sulphate	5 × 1 gm
26.	Anatto colour	–
27.	Butter salt	500 gms
28.	Sodium alginate	500 gms
29.	(a) Colorforice-cream Strawberry Rose Coffee (b) Flavorforice-cream Vanilla Pineapple Orange Banana	
30.	W.B.C. diluting fluid	
31.	R.B.C. diluting fluid	
32.	Ammonium sulphate	
33.	Urea	
34.	Superphosphate	
35.	Rock phosphate	
36.	Potassium sulphate	
37.	Muriate of potash	
38.	Zinc sulphate	
39.	Citric acid	

S. No.	Name of Chemical	Quantity
	Bact. Fertilizers	
40.	Rhizobium cultures	
41.	Anatobactor cultures	
	Pesticides	
42.	Malathion	
43.	Formaldehyde	
	Detergents	
44.	Tea-pol.	
45.	Liquid soaps	
46.	Vim	
47.	Bleaching powder	
	Vaccines	
48.	Foot and mouth	
49.	Rinderpest	

SUGGESTED LIST OF EQUIPMENTS AND TOOLS

S. No.	Name of Article	Quantity
1.	Currycomb	10 nos.
2.	Stiff brush	10 nos.
3.	Floor brush	10 nos.
4.	Tattoo ingset	2set
5.	Branding ironset	1set
6.	Ear tagging punch	1set
7.	Ear tags	1-100 nos.
8.	Ear notching punches	1 no.
9.	Burdizzocastrator	1 no.
10.	Baxy Burdizzocastrator	1 no
11.	Bull nose ring (small and big)	6
12.	Bull staff	1
13.	Bull leader	1
14.	Drenching bamboo	3
15.	Drenching bamboo	1

S. No.	Name of Article	Quantity
16.	Syringes 10 ml	3
17.	Trecar and canula	2
18.	Dehorner electric	1
19.	First aid kit	2
20.	Pre-bangtube	2
21.	Forceps	5
22.	Scissors	2
23.	Tongs	2
24.	Irrigator	1
25.	Cattle crush	1
26.	Artificial vagina (complete)	2
27.	Liners for A. V. of bovines	10
28.	Cones for A.V. of bovines	10
29.	Refrigerator	1
30.	Speculm (with light)	1
31.	Insemination gun for frozen semen	1
32.	Liquid Nitrogen container (complete3lit.cap.)	1
33.	Hot air oven	1
34.	Auto-clave	1
35.	Syringe sterilizer	1
36.	Student microscope	2
37.	Haemocytometer	1
38.	Haemoal binometer	1
39.	Haemometer	1
40.	Haematocrit (centrifuge 3000 rpm)	1
41.	Water bath automatic	1
42.	Gerber centrifuge	1
43.	Butyro meter stoppers	50
44.	Butyro meter stopper key	2
45.	Butyro meter stand	2
46.	Milk cans 40 lit capacity	1

S. No.	Name of Article	Quantity
47.	Milk plunger	1
48.	Milking pails	2
49.	Buckets	5
50.	Milk feeding pails with nipple	2
51.	Sediment test equipment	1
52.	Strip cup	2
53.	Herd recorders (spring balance)	1
54.	Chairs for cows	5
55.	Chains for calves	5
56.	Hand chaff cutter	2
57.	Blades for chaff cutter	4
58.	Wheelbarrow	2
59.	Cream separator hand operated (25 lit. capacity)	1
60.	Butter chum	2
61.	Butter worker	2
62.	Butter scoop	2
63.	Westphal balance	2
64.	Ice-cream freezer	2
65.	Ice-cream spoons	2
66.	Bhagona steel (s.s.)1 litre,2 litres	5 each
67.	‘Karahi’ (Frying S.Steel 2lit.)	2
68.	Bottle capper	1
69.	Shovels	2
70.	Spades	5
71.	Khurpi	10
72.	Rake	5
73.	Sickles	5
74.	Deshi plough	1
75.	Handhoes	3
76.	Sprayer	1
77.	Tagari (Basket)	5

S. No.	Name of Article	Quantity
78.	Hotplates	5
79.	Soxhlet apparatus	2
80.	Micro kjeldahl flask	1
81.	Water distillation	1
82.	Muffljefurnace	1
83.	Enamel trays	2
84.	Moisture boxes	10
85.	Chemical balance	1
86.	Weight box	2
87.	Incubator	1
88.	Milk measures 25ml	1
	50 ml	1
	100 ml	1
89.	Tripod stands	2
90.	Pestle and mortar	2
91.	Grinder (Hand operated)	1
92.	Semen shippers	2
93.	Resazurin colour comparator	1
94.	Strainers	6
95.	Clinical centrifuge	1
96.	pH meter	1

SUGGESTED LIST OF GLASSWARE

S. No.	Name of article	Quantity
1.	Semen collection vials	5
2.	Insemination cathetors	10
3.	Syring – 2 ml	5
4.	Clinical thermometer	5
5.	Dry and wet bulb thermometer	1
6.	Gerberbutyrometer	25

SUGGESTED LIST OF MISCELLANEOUS ITEMS

S. No.	Name of article		Quantity
1.	Reagent bottles	250ml	10
		500ml	10
2.	Soxhlet apparatus complete		6 sets
3.	Desiccator		1
4.	Wash bottles 500ml cap		10
5.	Glass rods		1
6.	Glass tubing		1
7.	Spirit lamps		10
8.	Slides and cover slips		100
9.	Indicator bottles		10
10.	Sample bottles		60
11.	Centrifuge tube (10 ml)		12
12.	Slides		2 gross

S. No.	Name of article	Quantity
1.	Kerosene	1 tin
2.	Muslin cloth	10 meter
3.	Ropes plastic	2 kg
4.	Bottle caps	1000
5.	Burettest	10
6.	Testtubest	10
7.	Jerry can 20litcap	5
8.	Rubber tubing	10mt.
9.	Measuring tape	2
10.	Tags	1 gross
11.	Gur	1 kg

Annexure–1

APPLICATION FORMAT FOR OFFERING VOCATIONAL SUBJECT / COURSES AT SENIOR SECONDARY LEVEL

1. **Name of the Course(s) applied for:** .....
   (with subject codes) .....
   .....
   .....

2. **Name of the School (Complete address)** .....
   (Also provide Website address if available) .....
   .....
   .....

3. **Affiliation No.** .....
4. **School ID.** .....
5. **Name of the Principal** .....
   - Phone No. .....
   - Mobile No. .....
   - E-mail .....
6. **Infrastructure** .....
   No. of Students .....
   No. of Teachers .....
   Student-Teacher Ratio .....
   No. of Classrooms .....
   Books in Library .....
   Total Computers in Computers Labs .....
   Specification of Computers .....
   Details of Constructed area for .....
   Establishing Laboratories .....
7. **Name of Teachers for Vocational Course** .....
   (Qualifications) .....
   .....
   .....

8. **Details of Draft** (in favour of **Secretary, CBSE,** Payable at Delhi)

   DD No.: ..... Date: ..... **Amount** (in Digits)
   .....

   Bank Issues: ..... **Amount** (in Words)
   .....

Signature & Seal of the Principal

Note: The document complete in all respects may be sent to: **The Director (Vocational Education), Central Board of Secondary Education 2, Community Center, Preet Vihar, New Delhi-110092.**

SENIOR SCHOOL

CURRICULUM

2016-17

VOLUME-IV
(PART-6)

Hospitality and
Tourism Based Courses

CENTRAL BOARD OF SECONDARY EDUCATION
"SHIKSHA KENDRA", 2, COMMUNITY CENTRE, PREET VIHAR, DELHI – 110 301"

HOSPITALITY AND TOURISM BASED COURSES

1. Food Production
2. Food and Beverage Services
3. Bakery and Confectionery
4. Front Office Operations
5. Travel and Tourism
6. Security

FOOD PRODUCTION

Introduction

Course Objectives

1. To develop interest and attitudes in hospitality industry.
2. To develop sufficient trained manpower for Hotels, Motels, Restaurants, Railway Catering Services, Flight Catering Services etc.
3. To assist in the tourism development programmes.
4. To develop necessary employable skills in the students.
5. To develop entrepreneurship.

CLASS–XI
ELECTIVE
FOOD PRODUCTION–I (734)
THEORY

Time: 3 Hours ***Marks: 60***

1. Introduction to Hospitality Industry — 2

- Introduction.
- Growth of Hotel industry.
- Introduction to sectors of F&B industry.
- Commercial catering and others.

2. Introduction to Kitchen Department — 3

- Various sections of kitchen.
- Levels of skills.
- Attitude and behaviour in the kitchen.
- Uniform and protective clothing.

3. Equipments and Fuels used in the Kitchen — 3

- Classification of equipments.
- Care and maintenance.

4. Culinary History — 3

- Origin of modern cookery.
- Continental cuisine (introduction only).
- Indian cuisine (introduction only).

5. Hierarchy — 5

- Classical brigade.

- Role of executive chef.
- Duties and responsibilities of various chefs.
- Modern staffing.

6. Functioning of Kitchen **3**

- Coordination between various sections of kitchen.
- Coordination between Food Production and other departments.

7. Introduction to Cookery **4**

- Aims and objectives of cooking food.
- Various textures.
- Techniques used in pre-preparation.
- Techniques used in preparation.

8. Methods of Cooking Food **6**

- Methods of heat transfer.
- Classification.
- Moist heat methods.
- Dry heat methods.
- Medium of fat.

9. Vegetable and Fruit Cookery **4**

- Classification of vegetables.
- Pigments and colour changes.
- Effect of heat on vegetables.
- Fruits.

10. Stocks **8**

- Definition.
- Types of stock.
- Classification.
- Standards of a good stock.

11. Sauces **8**

- Definition.
- Components of sauces.
- Mother sauces or basic sauces.
- Quality standards for sauces.
- Uses of sauces.

12. Soups **8**

- Definition.
- Classification with examples.

13. Eggs — 3

- Structure of egg.
- Selection of an eggs.
- Uses of eggs.

PRACTICAL

Time: 2 Hours — ***Marks: 40***

1. Introduction to Kitchen — 2

- Equipments – identification, description, uses and handling.
- Hygiene, kitchen etiquettes and practices.
- Knives – parts of a knife, knife handling and coding of knives.
- Safety and security in kitchen.

2. Cuts of Vegetables — 2

- Longish cuts (julienne, batons, frit).
- Dices (brunoise, macedoine, parmentiere).
- Fancy cuts (payssane, diamonds, oblique, shred, turning).
- Mirepoix.

3. Basic Cooking Methods and Pre-Preparations — 4

- Blanching.
- Preparation of tomato concasse.
- Boiling of vegetables.
- Frying.

4. Starch Cooking – Potatoes, Rice and Pasta — 2

5. Stocks — 2

- White stocks.
- Brown stocks.
- Fish stock.
- Vegetable stock.

6. Sauces – Basic Mother Sauces — 2

7. Soups — 2

- Cream soups, puree soups and veloutes.

8. Egg Cookery — 2

Preparation of variety of egg dishes Boiled, fried, poaches, scrambled and omelettes.

9. Vegetable Accompaniments — 2

- Basic methods of cooking applied.

- Boiled vegetables.
- Glazed vegetables.
- Fried vegetables.
- Stewed vegetables.
- Baked vegetables.

10. Demonstration and Preparation of Ten Simple Menus **20**

CLASS–XI
ELECTIVE
FOOD PRODUCTION–II (735)
THEORY

Time: 3 Hours ***Marks: 60***

Unit–1: Hygiene **18**

- Personal Hygiene. **3**
- Environmental Hygiene. **2**
- Food storage and causes of contamination. **3**
- Food borne illnesses. **5**
- Food poisoning. **3**
- Garbage disposal. **2**

Unit–2: Commodities **42**

1. Sugar **3**

- Introduction.
- Types of sugar.
- Role of sugar in cooking.
- Function of sugar.
- Storage of sugar.

2. Salt **3**

- Introduction.
- Types of salt.
- Role of saltin cooking.
- Storage and handling.

3. Herbs, Spices and Condiments **3**

- Herbs - Types, description and uses.
- Spices - Types, description and uses.
- Condiments - Types, description and uses.

4. Raising Agents **4**

- Classification of raising agents.

5. Thickening Agents **3**

- Factors.
- Types of thickening agents.

6. **Milk** **3**
   - Nutritive value of milk Procession of milk.
   - Types of milk.
   - By products.

7. **Cream** **3**
   - Introduction Composition of cream.
   - Manufacture of cream.
   - Uses of cream.
   - Types of cream.

8. **Butter** **3**
   - Introduction.
   - Processing of butter.
   - Types of butter.

9. **Cheese** **4**
   - Introduction.
   - Manufacture of cheese.
   - Classification of cheese.
   - Uses of cheese.
   - Cheese varieties and descriptions.

10. **Flour** **4**
    - Introduction.
    - Structure of wheat.
    - Milling of wheat.
    - Storage of flour.
    - Types of flour.

11. **Rice** **3**
    - Introduction.
    - Processing of rice.
    - Types & forms of rice.

12. **Cereals** **3**
    - Introduction.
    - Types of cereals.

13. **Pulses** **3**
    - Introduction.

- Types of pulses.

PRACTICAL

Time: 2 Hours *Marks: 40*

1. Basic Cutting Techniques **2**

Slicing, chopping and mincing of various vegetables
(to be practised thoroughly by all students).

2. Basic Indian Gravies **1**

Introduction and demonstration.

3. Preparation of General Gravy **1**

4. Preparation of White/Shahi Gravy **2**

5. Preparation of Makhani Gravy **2**

6. Preparation of Kadhai Gravy **2**

7. Preparation of Rice **2**

Boiled (drainage and absorption method).

- Jeera Pulao.
- Vegetable Pulao.

8. Preparation of Simple Vegetable Dishes **2**

Aloo Matar, Aloo Gobhi, Matar Paneer, Bhindi Masala etc.

9. Preparation of Various Dals, Choole etc. **2**

10. Preparation of Indian Breads Phulka, Poori, Parathas, Stuffed Parathas etc. **2**

11. Preparation of Simple Indian Sweets Kheer, Payeshpayasam, Phirnee, Halwa etc. **2**

12. Demonstration Preparation of 10 Sets of Menus Containing Indian Regional Item (30-40 Dishes). **20**

Preparation of all 10 menus by student and further repetition of all the menus to attain proficiency.

CLASS–XI

GENERAL FOUNDATION COURSE (501)

(Common for Food Production, Food and Beverage Services, Bakery and Confectionery and Front Office Operations)

Time: 3 Hours *Marks: 100*

Part–I: (Compulsory to all Vocational Courses) *Marks: 50*

A. Business Management and Entrepreneurship **30**

(a) **Entrepreneurship Orientation** **5**
Importance and relevance in real life: Emphasis on self employment.

(b) **Entrepreneurship Values and Attitudes** **5**
Innovativeness, Independence, Risk Taking, Analytical ability.

(c) **Entrepreneurial Motivation** **5**
Achievement Planning, personal efficacy, entrepreneurial goal setting.

(d) **Launching of a Business Venture** **15**
Identification of project, steps in setting up a business, information about various institutions providing assistance, project formulation.

B. Computational Skills **10**

(a) Percentage, ratio & proportion, profit & loss, discount, simple and compound interest, population growth and depreciation of value of articles using logarithm. **6**

(b) Area and volume: rectangle, parallelogram, circle, cube, cone, cylinder & sphere. **4**

C. Environmental Education **5**

(a) Environment and the society.

(b) Environment properties risks in different economic enterprises, in use of raw materials, in processing / manufacturing and designing.

(c) Poverty and environment.

D. Rural Development **5**

(a) Agriculture, the back bone of Indian Economy.

(b) Rural development projects in India including Integrated rural development programme.

(c) Agro based rural industries.

(d) Community approach to rural development.

Part–II *Marks: 50*

Catering Management **15**

Evolution & growth of Catering Industry, Importance, scope & branches of industry - Hotels, Motels, Inns, Commercial Hotels, Resort Hotels, Institutions, Hostels, Hospitals & Industrial Catering, Snack Bars, Railway Catering, Flight Catering.

Organisation **20**

Structure of the different departments, Staff organisation & functions in a Hotel - the type of relationship in the organisation. Duties & responsibilities of staff.

Basic Accounts **15**

Journal, Ledger and Cash book.

CLASS–XII
ELECTIVE
FOOD PRODUCTION–III (734)
THEORY

Time: 3 Hours *Marks: 60*

Unit–1: Kitchen Organization and Layout **5**

- Kitchen organization.
- General layout of kitchen in various organizations.
- Layout of receiving areas.
- Layout of service and wash up.

Unit–2: Haccp **5**

- Introduction.
- Importance of HACCP.
- Critical control points in HACCP.

Unit–3: Larder **6**

- Introduction.
- Functions of the larder.
- Sections of larder.
- Duties and responsibilities of larder chef.

Unit–4: Fish Cookery **10**

- Classification of fish with examples.
- Cuts of fish.
- Selection of fish and shell fish.
- Cooking of fish.

Unit–5: Meat Cookery **10**

- Introduction to meat cookery.
- Slaughtering of meat.
- Common poultry, lamb/mutton & cuts.
- Selection of meat products.
- Variety meats (offal).

Unit–6: Appetizers and Salads **6**

- Classification of appetizers with examples.
- Components of salad.
- Types of salad.
- Salad dressings.

Unit–7: Sandwiches **3**

- Parts of a sandwich.
- Types of sandwiches.
- Types of bread and fillings used.

Unit–8: Introduction to Bakery and Confectionery **10**

- Raw Materials used in Bakery & Confectionery.
- Method of:
  - (i) Bread Making.
  - (ii) Cake Making.
  - (iii) Pastry Making.
- Different Types of Cookies.

Unit–9: Culinary Terms **5**

PRACTICAL

Time: 2 Hours *Marks: 40*

To formulate 20 sets of menus keeping in mind the following points

1. One menu may contain 3-4 dishes. Each student is required to prepare four portions of each dish in a menu.
2. 5 sets of menu to be formulated from the dishes covered in class XI Continental practical.
3. 10 sets of menu may be formulated from the traditional recipes.
4. 5 sets of menu should be based on the latest food trends in the hotel industry.

Bakery and Confectionery

1. Two varieties of breads.
2. Two varieties of cookies.
3. Two varieties of decorated cakes.
4. Jam tart, chocolate éclairs.

CLASS–XII
ELECTIVE
FOOD PRODUCTION–IV (735)
THEORY

Time: 3 Hours *Marks: 60*

Unit–1: Quantity Food Production (Bulk Cooking) **3**

- Institutional Catering.
- Railway/Airlines.
- Hospital Catering.

Unit–2: Menu Planning for Bulk Cooking **5**

- Types of menu.
- Principles of menu planning.
- Planning menus for various occasions (application).

Unit–3: Indenting **9**

- Introduction.
- Principles of indenting.
- Importance of indenting.
- Portion sizes of common food items.
- Indenting for menus (applications).

Unit–4: Purchasing and Storing **6**

- Purchasing.
- Storage.

Unit–5: Food Costing **10**

- Importance of food costing.
- Elements of cost (food cost, labour cost and over heads).

- Calculation of food cost.
- Calculation of labour cost.
- Calculation of overheads.
- Calculation of kitchen profit/gross profit, after wage profit and net Profit.
- Expressing each element as percentage of sales.

Unit–6: Food Cost Control — 9

- Importance of food cost control.
- Factors affecting food cost.
- Portion control.
- How to control food cost.

Unit–7: Indian Regional Cuisine — 9

- Introduction to Indian regional cuisine.
- Heritage of Indian cuisine.
- Factors in fluencing the eating habits in different parts of the country.
- Common/popular regional cuisines of India.

Unit–8: Indian Regional Cuisine of the following states on the following grounds — 9

- Geo graphical Location.
- Staple Food.
- Festival.
- Features.
- Special Dishes.
  - (i) Kashmiri.
  - (ii) Punjabi.
  - (iii) Bengali.
  - (iv) Gujrati.
  - (v) Gaon.
  - (vi) Maharashtrian.
  - (vii) Hyderabadi.
  - (viii) South Indian.
  - (ix) Indian Breads.
  - (x) Indian Sweets.

PRACTICAL

Time: 2 Hours ***Marks: 40***

To formulate 20 sets of menus keeping in mind the following points

1. Each set of menu must have at least 4 items, including an Indian bread and/or sweet.
2. Minimum 40 portions to be prepared by the students, working in group of 3-4 students.
3. 5 sets of menu to be formulated from the dishes covered in class XII indian cuisine practical.

4. 10 sets of menu may be formulated from the traditional recipes.
5. 5 sets of menu should be based on the latest food trends in the hotel industry.

Tandoor

1. Introduction.
2. Woking of Tandoor.
3. Preparation of 3 Indian breads and two simple kebabs.

CLASS–XII
GENERAL FOUNDATION COURSE (501)
(Common for Food Production, Food and Beverage Services, Bakery and Confectionery and Front Office Operations)

Time: 3 Hours ***Marks: 100***

Part–I: (Compulsory to all Vocational Courses) *Marks: 50*

A. Business Management and Entrepreneurship 30

Management of Business

Elementary treatment/exposure to basic conceptual frame work of the topic listed below:

(a)= Basic Function. **6**

(b) Marketing Management. **6**

(c) Financial Management. **6**

(d) Production Management. **6**

(e) Personnel Management. **6**

B. Computational Skills 10

1. (a) Solution of linear equations and their application to problem of commercial mathematics. **5**

   (b) System of linear equations and in equation in two variables. Applications in formation of simple linear programming problems.

2. Statistics: Raw data, bar charts and Histogram; Frequency Tables; Frequency Polygon; Ogive; Menu, Median and Mode of ungrouped and grouped data; Standard Deviation; Introduction to Mortality tables; Price Index etc. Introduction to Computers. **5**

C. Environmental Education & Rural Development 10

1. **Environmental Education** **5**

   (a) Modernisation of agriculture and environment, irrigation, water logging, use of fertilisers, pesticides, soil erosion, land degradation (desertification and deforestation), silting and drying of water resources.

   (b) Rational utilisation, conservation and regeneration of environmental resources (soil, air, water, plant, energy, minerals).

2. **Rural Development** **5**

   Principles and goals of rural development, major problems/constraints in rural development in India.

Part–II *Marks: 50*

1. Catering Management: **10**

   Principles of purchasing & purchasing procedures.

2.	Principles of receiving, storing, issuing.	**15**
3.	Accounting. Trading account, profit & loss account & balance sheet.	**15**
4.	Selling skills in catering industry.	**10**

LIST OF RECOMMENDED BOOKS

1. Food Production–III, Text Book, Class–XII, Published by CBSE.
2. Food Production–IV, Text Book, Class–XII, Published by CBSE.
3. Food Production–IV, Practical Manual, Class–XII, Published by CBSE.
4. Food Production–III, Practical Manual, Class–XII, Published by CBSE.
5. Food Production–I, Practical Manual, Class–XI, Published by CBSE.
6. Food Production–I, Class–XI, Published by CBSE.
7. Food Production–II, Practical Manual, Class–XI, Published by CBSE.
8. Food Production–II, Class–XI, Published by CBSE.
9. Modern Cookery by Mrs. Thangam Philips.
10. Understanding Foods by Kotchivar & Cessarani.
11. Practical Cookery by Kinton & Cessarani.
12. Theory of Cooking (Student text book) by Mrs. K. Arora (Frank Bordhin).
13. Basic Food Preparation, Department of Food & Nutrition (Student textbook), Lady Irwin College (Longman).

REPETITION OF ALL THE MENUS BY THE STUDENTS TO ATTAIN PROFICIENCY SUGGESTED LIST OF EQUIPMENTS

(For a batch of 20 students)

	Name of the Equipment		**Qty.**
	Kitchen		
1.	Gas Cooking Range with oven and grill.		3 nos.
2.	Two gas burners (double).		7 nos.
3.	Stainless steel sinks (double with drains board).		3 nos.
4.	Mixer e.g. Sumeet.		1 no.
5.	Refrigerator (double door).	290 ltr.	2 nos.
6.	Pressure Cooker.	7.5 ltr.	1 no.
7.	Weighing scale.	(app. 5 kg.)	1 no.
8.	Heavy duty pot with lid (S.S.).	20 litres	1 no.
9.	Pastry cutter (set).		2 nos.
10.	Palatte knife (set).		5 nos.
11.	Patty tins.		20 nos.
12.	Tablespoons (S.S.).		20 nos.
13.	Forks (S.S.).		20 nos.
14.	Cake Tins (Assorted).		20 nos.

15. Cooling Racks.	(S.S. 25 cm × 20 cm.	10 nos

Small Equipment

Measuring Jug (S.S.).	1 ltr.	2 nos
S.S. Basin.	30 cm.	10 nos.
Soup stainers (stainless steel).		10 nos.
Brass or heavy gauze (Al. pan with lid 25 cm dia.).		10 nos.
Brass or heavy gauze (Al. pan with lid 20 cm dia.).		10 nos.
Rolling pins.	35 cm	10 nos.
Flat spoons.	30 cm	10 nos.
Frying spoons.	30 cm	10 nos.
Round spoons.	30 cm	10 nos.
Wooden spoons.	30 cm	10 nos.
Aluminium pie dish.	20 cm × 15 cm	20 nos.
S.S. Mugs.	500 ml	20 nos.
Jelly moulds.	500 ml	10 nos.
Karai (Black iron).	20 cm	10 nos.
Frypan (aluminium).	20 cm	10 nos.
Iron tawa.	25 cm	10 nos.
Thalis (S.S.).	30 cm	20 nos.
Nylocast chopping board.	45 × 30 × 2.5 cm	10 nos.
Stainless steel graters.		10 nos.
Al. stock pot with lid.	20 lts.	2 nos.
Atta sieve 30 cm dia.		5 nos.
Stainless steel trays.	60 × 60 cm	5 nos.
Lime squeezer (aluminium).		6 nos.
Piping bags with star nozzle.		10 nos.
Garbage bins with lid (syntex medium size).		4 nos.
Potato peeler.		10 nos.
Egg beater (S.S.).		10 nos.

Furniture

Demonstration S.S. table with shelve one locking drawer for one set of small. equipment 180 × 990 cm.	1 no.
Working table for general use, storage of equipment stainless steel. tops 75 × 75 × 80 cm.	10 nos.
Work table with Cupboard for storing equipment and general use.	2 nos.
Black Board 180 × 120 cm.	1 no.
Grinding stones.	2 Nos.

FOOD AND BEVERAGE SERVICES

Preamble

The food service industry is fast growing and ever changing. The development of Catering Institutions has closely followed the changes in food habits of people. Food changes are determined by socio-economic conditions and demographic shifts. Industrialization, Migration and International trade have resulted in greater employment for both men and women outside home. This led to increased need for people to depend on various food services operational for their meals outside their homes.

The Vocational Course in "Food and Beverage Services" is designed with the following objectives:

1. To develop skills of entrepreneurship in food service management.
2. To find employment as food production personnel and assistant manager in small scale food service unit.
3. The course enables the students to establish and manage a small scale food service unit. It provides them with the necessary knowledge and skill to run and control all operations in the unit.
4. It also equips the student to find employment in canteens, restaurants, hostel, railway catering and mobile catering.
5. It also helps to develop culinary skills.
6. The course can attain its objective only if it is taught by skilled teacher and the prescribed infrastructure provided by the school.
7. The school should also negotiate with neighborhood food service units for on-the-job training.

Introduction

1. To develop interest and attitudes in hospitality industry.
2. To develop sufficient trained manpower for Hotels, Motels, Restaurants, Railway Catering Services, Flight Catering Services etc.
3. To assist in the tourism development programmes.
4. To develop necessary employable skills in the students.
5. To develop entrepreneurship.

CLASS–XI
ELECTIVE
FOOD SERVICE (736)
THEORY

Time: 3 Hours ***Marks: 60***

Unit–1: The Hotel and Catering Industry **2**

- Introduction to the hotel Industry.
- Brief history of the growth of the hotel industry.

Unit–2: Introduction to Sectors of the F & B Industry **9**

1. Profit oriented/Commercial.
   (i) Restricted Market.
   - Transport Catering.

- Clubs.
- Private catering.
- Industrial (Contract).

(ii) General Market.

- Hotels/Restaurants/Pubs/Bars.
- Take away/Retail stores/Home delivery/Banqueting.
- Conferences/Hotel highway Eateries & Railways cruise/Airlines.
- Service counters/ODC/Fast food.

2. Cost provision restricted market social oriented food services, Institutional catering/schools/prisons/ hospital/ armed forces/industrial (own catering)/institutes & colleges.

Unit–3: Departmental Organization & Staffing 6

- Organization & Hierarchy of the F & B department of (a) Hotels (b) Industrial Food service (c) Department Stores (d) Fast Food Restaurant.
- French/American/English terms related to F & B staff.
- Duties and responsibilities of F & B staff Manager, Sr. Captain, Captain, Steward, Assistant Steward.
- Attributes of waiting staff.
- Inter and Intra department relationships. Coordination with Housekeeping, Kitchen, personnel, time office, Engineering, Front Office, Kitchen stewarding, Dish Washing.

Unit–4: Food Service Areas 7

- Specialty Restaurants.
- Coffee Shop.
- Cafeteria.
- Fast Food.
- Room Service and Mini Bar.
- Banquet.
- Bar.
- Vending Machines.

Ancilliary Departments

- Pantry.
- Food pick up area.
- Store.
- Kitchen stewarding.
- Dish Washing.

Unit–5: F & B Service Equipment 6

Familiarization of

- Cutlery.
- Crockery.
- Glassware.
- Flatware.

- Linen.

Hollow Ware

- Table cloth.
- Slip cloth.
- Moulton.
- Napkins.
- Waiter's cloth.
- Tea and glass cloth.
- Frills.
- Buffet cloth.

Furniture

- Table.
- Chair.
- Side board.

Unit–6: Forms of Service — 6

- Full Silver Service.
- Pre Plated/American Service.
- Russian Service.
- English Service.
- Gueridon Service.
- Cafeteria Service.
- Buffet Service.
- Snack Bar Service.
- Grill Room Service.

Unit–7: Meals of the Day — 3

- Early Morning Tea.
- Breakfast.
- Brunch.
- Lunch.
- Afternoon/High Tea.
- Dinner.
- Supper.

Unit–8: Menu Planning — 6

- Origin of Menu.
- Rules to be observed for Planning Menus.
- Types of Menu.
  - (i) Tabled Hotel/A'lacarte.
  - (ii) Cyclic.

(iii) Plat du jour.

(iv) Cartedu jour.

(v) Banquet menu.

Unit–9: French Classical Menu **12**

- Eleven courses of the menu.
- Sequence.
- Examples from each course.
- Cover of each course.
- Accompaniments.

Unit–10: French Culinary Terms **3**

PRACTICAL

Time: 2 Hours ***Marks: 40***

1.	Familiarization of Cutlery.	**1**
2.	Familiarization of Crockery.	**1**
3.	Familiarization of Glassware.	**1**
4.	Familiarization of Hollow ware and Flatware.	**1**
5.	Familiarization of furniture.	**1**
6.	Familiarization of ancillary areas of F & B Dept.	**1**
7.	Familiarization of Linen used in the F & B Dept.	**1**
8.	Handling of trays and salvers.	**1**
9.	Mise en scene – Laying and relaying of Table cloth.	**1**
10.	Mise en Place.	**2**
11.	Service of water.	**1**
12.	Holding and use of Service Spoon and Fork.	**2**
13.	Sequence of service/taking orders.	**4**
14.	Service of Food – Silver Service.	**4**
15.	Laying tables for Different Meals.	**6**
16.	Lunch Service.	**8**
17.	Pre Plated Service.	**4**

CLASS–XI
ELECTIVE
BEVERAGE SERVICES (737)
THEORY

Time: 3 Hours ***Marks: 60***

Unit–1: Beverages **4**

- Introduction.

Unit–2: Classifications of Beverages 4

- Non-Alcoholic Beverages.
- Alcoholic Beverages.

Unit–3: Non Alcoholic Beverages Tea 12

- Origin and Manufacture.
- Types of Tea.
- Herbal Tea.
- Storage of tea.
- Golden Rules of tea making.

Unit–4: Coffee 12

- Origin and Manufacture.
- Types of Coffee.
- Rules of making good Coffee.
- Storage of coffee.
- Laced of fee.

Unit–5: Refreshing Drinks 6

- Aerated Waters.
  - (i) Soda.
  - (ii) Tonic.
  - (iii) Bitter.
  - (iv) Dry Ginger.
  - (v) Coca Cola.
  - (vi) Orange Flavoured.
  - (vii) Lemon.
- Natural Spring and Mineral Waters.
- Squashes.
- Syrups.

Unit–6: Nourishing Drinks 4

- Juices
  - (i) Fresh Juices.
  - (ii) Canned Juices.
- Milk Base
  - (i) Milk Shakes.
  - (ii) Ice Cream Shakes.
  - (iii) Lassi Sweet or Salted.
  - (iv) Thandai (Indian Milk drink with almonds, black pepper, etc.).
  - (v) Cold Coffee with or without Ice Cream.

(vi) Malt Beverages, Chocolate, etc.

(vii) Cold Milkor Hot Milk (with full fat or skimmed or toned).

- Punches and Mocktails.

Unit–7: Mocktails or Non Alcoholic Mixed Drinks **6**

- Meaning of word Mocktail.
- Ingredients used in making mocktails.
- Methods of making mocktails.
- Famous Mocktails.
- Rules for making good mocktails.

Unit–8: Cocoa **8**

- Meaning of word Cocoa and Introduction.
- Processing of Cocoa.
- Collection of Cocoa products.
- Fermentation.
- Drying.
- Roasting.
- Winnowing.
- Dutch Processing.
- Grinding.
- Extraction.
- Different species of Cocoa.

Unit–9: Terminology Pertaining to Beverage Services **4**

PRACTICAL

Time: 2 Hours ***Marks: 40***

1.	Drawing Glassware.	**2**
2.	Service of Water/Bottled Water/Mineral Walter.	**3**
3.	Service of Tea.	**4**
4.	Service of Coffee.	**4**
5.	Service of Lassi and Butter Milk.	**4**
6.	Service of Juices.	**4**
7.	Service of Cold Coffee/Milk Shakes.	**6**
8.	Service of Beverages in Rooms.	**5**
9.	Preparation of Instant Tea.	**4**
10.	Preparation of Instant Coffee.	**4**

CLASS–XI
GENERAL FOUNDATION COURSE (501)
(Common for Food Production, Food and Beverage Services, Bakery and Confectionery and Front Office Operations)

(Refer to page 8)

CLASS–XII
ELECTIVE
FOOD SERVICE (736)
THEORY

Time: 3 Hours ***Marks: 60***

Unit–1: Breakfast Service **10**

Types of Breakfast

- Continental Breakfast.
- American Breakfast.
- English Breakfast.
- Indian Breakfast.

Unit–2: Simple Control System **8**

- Kot/Bill Control System.
- Special Kot (EnPlance, Nc Etc.).
- Restaurant Sales Control Kot, Bill.

Unit–3: Room Service **8**

- Types of Room Service.
- Order Taking and Telephone handling.
- Room Service Door Knob Card.

Unit–4: **12**

Banquets and Buffet

- Introduction.
- Types of Banquets– formal/semi formal/informal.

Types of Buffets

- Finger Buffet.
- Fork Buffet.
- Break Fast Buffet.
- Sit Down Buffet.

Unit–5: Pantry Operations **14**

- Importance.
- Organization chart.

- Layout.
- Common equipments.
- Popular Dishes prepared in a pantry.

Unit–6: Kitchen Stewarding **4**

- Introduction.
- Importance.
- Machines used.
- Care of inventory.

Unit–7: Situation Handling **4**

- Handling complaints.
- Procedure during a Fire accident.
- Dealing with a bomb threat /terrorist attack.

PRACTICAL

Time: 2 Hours ***Marks: 40***

1.	Recap–Mise-en-Place.	**4**
2.	Recap & Practice of Silver Service.	**8**
3.	Recap & Practice of Tray & Salver Handling.	**4**
4.	Recap–Laying Table for Different Meals.	**4**
5.	Room Service Tray and Trolley Setup.	**4**
6.	Setting up Various Buffets.	**2**
7.	Service of Indian Regional Dishes.	**6**
8.	Dinning Etiquettes & Table Manners.	**2**
9.	Pantry Operations.	**6**

Note: Students to undergo practical Food Service training during lunch hour on rotational basis.

CLASS–XII
ELECTIVE
FOOD AND BEVERAGE COST AND CONTROL (737)
THEORY

Time: 3 Hours ***Marks: 60***

Unit–1: Food Cost Control **6**

- Introduction to Control.
- Definition.
- Objective and Advantages of Cost Control.
- Obstacle to Food and Beverage Controls.
- Limitation of Cost Control.

- Methodology and Phases of Cost Control.
- Essentials of Cost Control.

Unit–2: Cost and Costing **8**

- Elements of Cost:
  - (i) Food Cost.
  - (ii) Labor Cost.
  - (iii) Over Heads.
- Break Even Point.

Unit–3: Introduction to Cost Control Cycle **4**

- Purchasing.
- Receiving.
- Storing.
- Issuing.
- Production Control.
- Sales Control.

Unit–4: Beverage Control **4**

- Beverage Sales Control.
- Beverage Order Ticket (BOT).
- Beverage Cheque.
- Beverage Summary Sheet.
- Beverage Sales Summary Sheet.
- Visitors Tabular Ledger/NCR.
- Guest Weekly Book/Day Book/NCR.

Unit–5: Purchasing **6**

- Definition.
- Aims of Purchasing.
- Purchasing Staff.
- Selection of suppliers.
- Types of food purchased.
- Quality Purchasing.
- Standard Purchase Specification (SPS).
- Purchase Methods.
- Controls in Purchasing.
- Purchase Order.

Unit–6: Receiving **6**

- Introduction.
- Receiving Staff.
- Equipments for receiving.

- Documents provided by Suppliers.
- Quotation.
- Delivery Note.
- Bill/Tax Invoice.
- Credit Note.
- Records maintained in Receiving Department.
- GRB.
- Meat Tag.
- Controls in Receiving.
- Receiving Procedure.
- Blind Receiving.
- Frauds in Receiving.

Unit–7: Storage Control — 6

- Aims and Objectives.
- Store Room Staff.
- Location and Layout.
- Arrangement of Food.
- Inventory Control.
- Stock Levels.
- Records maintained.
- Stock Taking.
- Controls in Storage.

Unit–8: Issuing Control — 6

- Indenting.
- Transfer Notes.

Unit–9: Production Control — 6

- Standard Recipe.
- Standard Portion Size.

Unit–10: Sales and Revenue Control — 8

- Process for receiving payments by various modes:
  - (i) Cash.
  - (ii) Travelers Cheque.
  - (iii) Credit Card.
  - (iv) Debit Card.
  - (v) Credit Sale (Companies).
  - (vi) Travel Agents, etc.
- ECR
- NCR
- POS

- Cash Handling.

PRACTICAL

Time: 2 Hours ***Marks: 40***

Unit–1: Food Cost Control **10**

Numerical on:

- Food Cost (material cost).
- Labor Cost.
- Over heads.
- Total Cost.
- Food Cost Percentage.
- Labor Cost Percentage .
- Over Heads Percentage.
- Total Cost Percentage.

Unit–2: Cost and Costing **12**

Numerical on:

- Food and Beverage departmental Profit and Loss account.
- Profit and Loss account under the Net profit Method of Food and Beverage department.
- Trading and Profit and Loss account of Food and Beverage department.
- Profit /Volume (P/V) ratio.
- Break Even Chart.
- Break Even Point (in units).
- Break Even Point (in Rs).
- Margin of safety.
- Profit at Maximum Level.

Unit–3: Beverage Control **8**

- Beverage Sales Control Chart .
- Bar Order Ticket (B.O.T.).
- Restaurant Check.
- Restaurant Sales Summary Sheet Numericalon.
- Guest Weekly Bill/DayBook.
- Visitor's Tabular Ledger (V.T.L).

Unit–4: Assignment: Preparation 'Beverage Control System Flow Chart' with each step explained in detail. **10**

CLASS–XII

GENERAL FOUNDATION COURSE (501)

(Common for Food Production, Food and Beverage Services, Bakery and Confectionery and Front Office Operations)

(Refer to page 13)

LIST OF RECOMMENDED BOOKS

1.	Food & Beverage Cost & Control, Practical Manual, Class–XII.	Published by CBSE
2.	Food Service–II, Practical Manual, Class–XII.	Published by CBSE
3.	Food & Beverage Cost & Control, Class–XII.	Published by CBSE
4.	Beverage Service, Practical Manual, Class–XI.	Published by CBSE
5.	Food Service–I, Text Book, Class–XI.	Published by CBSE
6.	Food Service–I, Practical Manual, Class–XI.	Published by CBSE
7.	Food Service II, Class–XII, Text Book.	Published by CBSE
8.	Beverage Service, Class–XI, Text Book.	Published by CBSE
9.	Basic Food Preparation Manual.	Lady Irwin College
10.	Modern Cookery, T. Phillip.	Institute of Catering & Hotel Mgmt., Mumbai, Vol. I & II
11.	Food Service in Institution, West & Wood Shagarh, Hagar.	Edition V and VI.
12.	Catering Management, Interpretated Approach, Mathur & Sethi, Iley Publication.	Edition I Edition II
13.	Food and Beverage Service Manual, Sudhir Andrews.	Inst. of Hotel and Catering Management, Delhi
14.	Sanitary Techniques in Food Service.	Mergert Langree
15.	Experimental Cookery.	Griswold
16.	Meal Management.	Margret Kinder

SUGGESTED LIST OF EQUIPMENTS

(For a batch of twelve students)

S. No.	Name of Equipment	Detail	Qty.
1.	Baking oven.	Inalsa	2
2.	Refrigerator with freezer.		1
3.	Gas hot plates/burners.		12
4.	Mixi/Grinder.	Inalsa	3
5.	Weighing Scale.	Avery (2 kg)	3
6.	Pressure Cooker.	2 litre (Hawkins/Prestige)	12
		5 litre	2
		8 litre	2
7.	Steel Can (tea).	Canteen size	2

S. No.	Name of Equipment	Detail	Qty.
8.	Gas cylinders.		4
9.	Measuring jug and cups.		12
10.	Measuring spoons.	1/4 tsp, 1/2 tsp, 1 tsp	12
11.	Bowls medium (Stainless steel).		24
12.	Bowls small (S.S.).		24
13.	Thalis/plates assorted size (S.S.).		36
14.	Rolling pins.	40-50 m length	12
15.	Egg beaters.	Wire type 20-25 cms	12
16.	Wooden spoons.	30 cms	12
17.	Degchi (small).		12
18.	Degchi (medium and extra large).		12
19.	Seives (small).		4
20.	Sevies (big).		4
21.	Bread knives.		4
22.	Kitchen knives.		12
23.	Chopping board.		12
24.	Baking trays.		24
25.	Biscuits cutters.	Assorted	36
26.	Cake moulds.	(Assorted)	12
27.	Sauce pans (heavy).		2
28.	Teflon pans.		12
29.	Piping bag and nozzles.	Assorted shape/size	12
30.	Jelly mould.		12
31.	Peelers (Stainless steel).		12
32.	Pastry boush.		12
33.	Trays (small, medium, large).		12
34.	Milk can.		1
35.	Tawas with wooden handle/non stick.		12(6)
36.	Parat (small and large).		12
37.	Grater (S.S.).		12
38.	Katories (Stainless Steel).		12
39.	Table spoon, desert spoon.		24 of each

S. No.	Name of Equipment	Detail	Qty.
	tea spoon (different forms) knives.		
40.	Tea strainers/big strainers.		4 + 4
41.	Masala Box.		6
42.	Dust Bin.		12
43.	Dinner set, lemon sch., tea sch.		1 each
44.	Pulp extractor.		2
45.	Gas lighters.		12
46.	Storage cans, Bottles and Jars.	Assorted sizes	3-4 dozs.
47.	Table linen and Hand towels.		2 sets
48.	Buckets.		6
49.	Chemicals (adulteration+Bottles testing).		12
50.	Test tubes and test tube stands.		100+12 (stands)
51.	Icebox (commercial)/Cooling unit.		1
52.	Soap dishes.		12
53.	Karahi (small, medium, extra large).		12
54.	Poni (small, medium, extra large).		12

S. No.	Furniture	Qty.
1.	Work tables.	12 nos
2.	Instructors table.	1 no.
3.	Storage cupboard for : Equipment, Stores, Crockery.	3 nos.
4.	Sink with draining boards.	12
5.	Syntex tank for water storage.	300 litres
6.	Exhaust fans.	4
7.	Tube light on working units.	6
8.	Trolleys for vegetable storage.	2
9.	Racks.	4
10.	Display Boards.	2
11.	Showcase.	1

BAKERY AND CONFECTIONERY

Introduction

The overall objectives of this course will be:

- To acquire basic skills of Bakery and Confectionery.
- To stimulate and lay foundation for further training in Bakery and Confectionery.
- To create a pool of qualified and trained bakers and confectioners in the Hotels and Bakery and Confectionery industry.

CLASS–XI
ELECTIVE
BAKERY (751)
THEORY

Time: 3 Hours ***Marks: 60***

Unit–1: Introduction to Bakery and Confectionery — 8

- Scope of bakery.
- Organizational structure.
- Units of measurements.
- Bakery terms.
- Basic equipment.
- Baking temperatures for bread and confectionery.

Unit–2: Hygiene — 6

- Concept of hygiene and its importance in bakery.
- Personal hygiene.
- Work area hygiene.
- Basic first aid.

Unit–3: Structure of Wheat Grain — 7

- Physical structure.
- Longitudinal section.

Unit–4: Milling of Wheat — 7

- Wheat milling process.
- Roller flour, stone mills.

Unit–5: Flour — 8

- Composition of flour.
- Types of flour/ grades of flour.
- Water absorption power.
- Gluten.

Unit–6: Role of Raw Materials used for Bread Making — 8

- Essential: Flour, salt, yeast, water.
- Optional: Sugar, eggs, milk and milk products, butter, oil etc.

Unit–7: Methods of Bread Making **8**

- Straight dough method.
  - (i) Salt delay.
  - (ii) No time dough.
- Sponge and dough method.

Unit–8: Characteristics of Good Bread **8**

- External : Volume, symmetry, shape, colour.
- Internal : Texture, aroma, clarity, elasticity.

PRACTICAL

Time: 2 Hours ***Marks: 40***

Unit–1: Basic Bread by Different Methods

- Bread rolls. **4**
- Bread sticks. **4**
- Fancy Rolls. **4**
- White bread. **4**
- Brown bread. **4**
- Soft rolls. **4**
- Buns. **4**
- Milk bread. **4**
- Whole wheat bread. **4**
- Pizza. **4**

CLASS–XI
ELECTIVE
CONFECTIONERY (752)
THEORY

Time: 3 Hours ***Marks: 60***

Unit–1: Introduction to Confectionery **10**

- Scope of confectionery.
- Confectionery terms.
- Small and large equipment used in bakery and confectionery.

Unit–2: Role of Raw Material Required for Confectionery **12**

- Wheat, flour, sugar, fat, eggs.
- Essential ingredients: flour, sugar, shortening, eggs.

- Optional ingredients: baking powder, milk, milk products, dry fruits, baking soda, dairy products, etc.

Unit–3: Moistening Agents **10**

- Milk.
- Egg.
- Water.

Unit–4: Fats and Oil **8**

- Composition, functions in confectionery, types of fats and oil, storage.

Unit–5: Leavening Agents **8**

- Chemical, natural, water vapors and biological.

Unit–6: Cake Making Methods **12**

- Sugar batter method.
- Flour batter method .
- Genoese.
- Blending.

PRACTICAL

Time: 2 Hours ***Marks: 40***

Unit–1: Cakes by Different Methods **12**

- Vanilla Sponge cake.
- Fruit cake.
- Fatless sponge.
- Swiss roll.
- Madeira cake.
- Chocolate sponge.

Unit–2: Biscuits and Cookies **20**

- Melting moments.
- Macaroons.
- Tricolor biscuits.
- Choco chip cookies.
- Nan khatai.
- Salted biscuits.
- Nut cookies.
- Bachelor buttons.
- Butter cookies.
- Langue-de-chats.

Unit–3: Short Crust Pastry **8**

- Jam tarts.

- Apple pie.
- Bake well tarts.
- Lemon curd tarts.

CLASS–XI
GENERAL FOUNDATION COURSE (501)
(Common for Food Production, Food and Beverage Services, Bakery and Confectionery and Front Office Operations)

(Refer to page 8)

CLASS–XII
ELECTIVE
BAKERY (751)
THEORY

Time: 3 Hours ***Marks: 60***

Unit–1: Bread Faults and Remedies **15**

- Basic reasons for faults.
- Common bread faults(internal and external).
- Remedies.

Unit–2: Bread Improvers and Additives **10**

- Natural : Milk, egg, S.M.P, soya flour, fat, sugar.
- Chemical: Glycerol mono state, Potassium bromate, potassium iodate.

Unit–3: Types of Oven **10**

- Electric oven: OTG, microwave, rotary, single deck, double deck, pizza oven.
- Non electric oven: Diesel oven, gas oven , brick oven.

Unit–4: Bread Diseases **10**

- Rope and mold.
- Causes and prevention.

Unit–5: Bakery Layout the Right Approval for Setting up of a Bakery **15**

- Location.
- Government procedure.
- Selection of equipment.
- Total space required.
- Electricity.

PRACTICAL

Time: 2 Hours ***Marks: 40***

Unit–1: Rich Dough's and Variety Breads

- Brioche.
- Danish.
- Doughnut.
- Savarin.
- Garlic bread.
- French bread.
- Focaccia.
- Masala bread.
- Multi grain bread.

CLASS–XII
ELECTIVE
CONFECTIONERY (752)
THEORY

Time: 3 Hours ***Marks: 60***

Unit–1: Costing **6**

- Components of cost, behaviour of cost (fixed cost, semi fixed cost, variable cost).

Unit–2: Storage of Raw Material and the Finished Products **6**

Unit–3: Pastry Making **10**

- Principles of pastry making.
- Various types of pastries.

Unit–4: Characteristics of Cakes **10**

- External.
- Internal.

Unit–5: Cake Faults and their Remedies **10**

Unit–6: Types of Icings **8**

Unit–7: Preparation of Cookies and Biscuits **10**

PRACTICAL

Time: 2 Hours ***Marks: 40***

Unit–1: Puff Pastry **10**

- Veg patties.
- Mushroom patties.
- Cheese patties.
- Chicken patties.
- Cheese straw.

- Masala straw.
- Khara biscuit.
- Palmiers.
- Mille fieulle.

Unit–2: Choux Pastry **10**

- Eclairs.
- Profite roles.

Unit–3: Icings **10**

- Fondant.
- Royal.
- Marzipan.
- Frosting.
- Dairy and non-dairy cream icing.

Unit–4: Hot and Cold Desserts **10**

- Caramel custard.
- Bread and butter pudding.
- Triffle pudding Basic soufflé puddin.

CLASS–XII
GENERAL FOUNDATION COURSE (501)
(Common for Food Production, Food and Beverage Services, Bakery and Confectionery and Front Office Operations)

(Refer to page 13)

LIST OF RECOMMENDED BOOKS

1. Bakery–I, Student Handbook and Practical Manual, Class–XI, Published by CBSE.
2. Confectionery, Students Handbook & Practical Manual, Class–XI, Published by CBSE.
3. A Professional Text to Bakery and Confectionary by John Kingslee.
4. Ornamental Confectionery and the Art of Baking in all its Branches by Herman Hueg.
5. Bread: A Baker's Book of Techniques and Recipes by Jeffrey Hamelman.
6. The Taste of Bread by Raymond Calvel.
7. Special and Decorative Breads (The Professional French Pastry Series) by Roland Bilheux.

SUGGESTED LIST OF EQUIPMENTS
(For a batch of twenty students)

Name of the Equipment	Capacity/Dimension	Qty

Heavy Duty Equipment

1.	Baking oven (Single Deck).		01 No.
2.	Planetry Mixer.	15–20 litres	01 No.
3.	Refrigerator (Two door).	185 litres	01 No.
4.	Gas Hot plate (Domestic, 2 burners).		01 No.

Light Duty Equipment

1.	Weighing scales Upto 5 kgs.		02 Nos.
2.	Measuring Jugs.	½ litre	02 Nos.
3.	Measuring spoons.	¼ teaspoon	03 Sets
4.	Sugar/candy Thermometer.		02 Nos.
5.	Enamel Bowls (small).	20 cm dia.	24 Nos.
6.	Enamel Bwl (big).	30 cm dia	12 Nos.
8.	St. Steel thali (small).		24 Nos.
9.	Rolling pins (wooden).	40–45 cms length	12 Nos.
10.	Egg Beaters (wires type).	20–25 cms length	24 Nos.
11.	Wooden spoons 30 cms.		24 Nos.
12.	Pallete knife .	30cms (Blade)	24 Nos.
13.	St. Steel Degchi (Small).	25 cm. dia.	12 Nos.
14.	Brass Degchi (Medium) Heavy.		12Nos.
15.	Sieves (Small) Maida.		10 Nos.
16.	Sieves (Big).		02 Nos.
17.	Scissors Medium.		02 Nos.
18.	Bread knife 45 cms.	Length	02 Nos.
19.	Turn table (Decoration table).	23 cms dia.	02 Nos
20.	Acrylic chopingborad.	75× 45 × 1½ cms	02 Nos.
21.	Baking Trays Size as peroven.		24 Nos.
22.	Coolingracks.	45× 30 × 5 cms	10 Nos.
23.	GraterSt. Steel.		05 Nos.
24.	Cakemoulds.	Differentsizes & shapes	20 Nos.
25.	Roundcake moulds.		10 Nos.
26.	Sauce Pan St. Steel (Heavy).		02 Nos.
27.	Frying spoon (Pony).	Medium	02 Nos.
28.	Sauce Pan (Brass Small).	12 cms	10 Nos.
29.	Biscuit cutters.	Differentsizes & shapes	01 Set
30.	Strainer (soup).		05 Nos.
31.	Spatula (Plastic).		10 Nos.
32.	Scrapers (Plastic).		05 Nos.
33.	Pizzacutters.		02 Nos.
34.	Swiss Roll Tin.	40 × 20 × 2 cms	12 Nos
35.	Pattytins Aluminium.		24 Nos.

36.	Piping Bags (Small).		05 Nos.
37.	Piping Bags (Big).		05 Nos.
38.	Nozzles.	Different sizes & shapes	02 Sets
39.	Breadtins.	400 gms	25 Nos.
40.	Breadtins.	800 gms	10 Nos.
41.	Savarin mould salum.		10 Nos.
42.	Jelly Moulds alum.		10 Nos.
43.	S.Steel Tea spoons.		12 Nos.
44.	Muffin Moulds.		50 Nos.
45.	Frypan (Nonstick).		02 Nos.
46.	Frypan (Ordinary).	Big	02 Nos.
47.	Peelers S/S.		10 Nos.
48.	Knives Big & Small (2 each).		04 Nos.
49.	S.Steel A.P. Spoons.		12 Nos.
50.	Copper Pans (Heavy).	5 litres	02 Nos.
51.	St. Steel Fork A.P.		12 Nos.
52.	Flanrings.	12cm dia.	20 Nos.
53.	Pastry Brush.	10 Nos.	
54.	Aluminium Basins.	30 cms dia.	10 Nos.

Furniture

1.	Work bench with marble stone top with drawer & shelves.	75 × 75 × 85 cm height	10Nos
2.	Demonstration Table with Marble Top.	150 × 90 × 85 cm	01 No.
3.	Instructor's table.	120 × 60 × 85 cm	01 No.
4.	Instructor's chair with backrest (cane).		01 No.
5.	Aluminium racks.		02 Nos.
6.	Steel Almirah.		01 No.
7.	Stainless steel sink with Draining Board.		04 Nos

FRONT OFFICE OPERATIONS

CLASS–XI
ELECTIVE
BASIS OF FRONT OFFICE (753)
THEORY

Time: 3 Hours ***Marks: 60***

Unit–1: Hotel Organization **5**

- Departmental organization of hotels.
- Staff hierarchy chart of hotels.

Unit–2: Hotel Room **5**

- Types of hotel rooms.

Unit–3: Meal Plan & Basics of Charging **5**

- Types of meal plan.
- Different basis of charging.

Unit–4: Front Office **8**

- Staff organization of front office: hierarchy.
- Section in front office.
- Equipment used in front office.
- Duties & responsibility of front office staff.

Unit–5: Lobby and its Layout **6**

Unit–6: Co-ordination of Front Office with other Departments **6**

Unit–7: Safety and Security **8**

- For the hotel.
- For the guest.
- Role of technology in security.

Unit–8: Reservation **10**

- Importance for guest and hotel.
- Types of reservation.
- Modes & sources.
- Process- automated and Manual.
- Cancellation & amendments.

Unit–9: Assignments **7**

References:

- **Hotel Front Office Training Manual:** Sudhir Andrews.
- **Front Office Management & Operations:** Sudhir Andrews.
- **Front Office Operations & Management:** Rakesh Puri.
- **Hotel Front Office Operations & Management:** Jatashankar R. Tiwari.

Z **Front Office Management:** Sushil Kumar Bhatnagar.

PRACTICAL

Time: 2 Hours ***Marks: 40***

Unit–1: 5

- **Activity I:** Students to write on a paper their experience of visiting a hotel and a restaurant. They should discuss the difference they found in the product and services of the two.
- **Activity II:** Draw the staff hierarchy of a large hotel and present it to the class in a team of four students.
- **Activity III:** Draw the Management organization chart of a large hotel and present it to the class in a team of four students.
- **Activity IV:** Draw the departmental organization chart on the basis of revenue and present it in the class.
- **Activity V:** Discuss in the class room about the staff positions which may be eliminated in a medium size hotel and a small size hotel respectively.
- **Activity VI:** Discuss in the class room the advantages and disadvantages of multi tasking by staff members in a hotel. Assume that you are the Front office manager of a hotel, from your perspective, what are the advantages and disadvantages of working in a large hotel with specialized positions in comparison to a small hotel where many positions are combined into one position.

Worksheet

- **Activity VII:** Students to classify the following departments on the basis of revenue and write in the column.

Z Department	Z Classification
Z Front office	Z
Z Engineering & maintenance	Z
Z Kitchen	Z
Z Shopping Arcade	Z
Z Food & beverage service	Z
Z Accounts	Z
Z Human resource	Z
Z Sales & marketing	Z
Z Purchase	Z
Z Travel Desk	Z
Z Business Centre	Z

Unit–2: 5

- **Activity I:** Each student to prepare a model of any one type of guest room in a hotel and present it to the rest of class with explanation of its unique features.
- **Activity II:** In a group of four students to prepare a chart depicting four different types of rooms keeping in view the dimensions of beds and other facilities.

- **Activity III:** Group discussion on the relationship between type of hotel and the type of rooms offered by that type of hotel.
- **Activity IV:** Discussion on alternative type of room which may be offered to the guest if his desired type of room is not available in the hotel.

Unit–3: 5

- **Activity I:** Students to perform a role play interacting as a group of guests and front office personnel discussing the contents of different meal plans offered by the hotel and their applicability depending upon the specific requirement of each guest.
- **Activity II:** Work sheet.

  Fill the following in given chart:

  Room only Plan, Bed & Breakfast Plan, Room + American Breakfast, Room + Continental Breakfast+ Lunch+ Dinner, Resorts.

Meal Plan	Other Name	Inclusions	Preferred by
European Plan		Room only	Business hotel ,Transit hotel, Motels.
Continental Plan		Room + Continental Breakfast	Business Hotels.
Bermuda Plan	Bed & Breakfast Plan		Hotels with lot of sightseeing around such as historical / heritage destinations.
American Plan	Full Board / En Pension		Resorts
Modified American Plan	Half Board/ Demi-Pension	Room + Continental Breakfast+ Lunch/ Dinner	Resorts

- **Activity III:** Group discussion on relative merits and demerits of Check out time basis of charging and 24 hrs basis of charging.
- **Activity IV:** A guest checked in at 09.00 hrs and checked out at 18.00 the next day. According to the 12 noon check-out time basis he is to be charged for three days. Enact a role play on the ensuing argument between the guest and the cashier and the explanation provided by the hotel to the guest on this system of charging.
- **Activity V:** Students should visit nearby hotels and collect tariff cards from the reception. Each student should design a tariff card of Hotel ABC on the basis of his own creativity.
- **Activity VI:** Role play by 2-students one as a guest other one as a receptionist.

Unit–4: 5

- **Activity I:** Students in group to draw the front office staff organization chart for a large hotel and medium sized hotel respectively on the chart paper and present it in the practical class room.
- **Activity II:** Teacher to familiarize the students with the different racks and equipments in the practical lab.
- **Activity III:** School should organize a field trip for the students to have a firsthand look at the equipments used in hotel for front office department and their usage.
- **Activity IV:** In groups of four each, Students to prepare a presentation on any one section of front office and to present it to rest of the class with the help of chart papers.
- **Activity V:** Each student to impersonate different front office personnel by speaking 2-3 lines of a dialogue about his job profile . Other students of the class should try and recognize whom he is impersonating.

- **Activity VI:** Chart preparation of departmental organization of hotels.

Unit–5: **5**

- **Activity I:** Students to draw the layout of lobby in their chart papers with use of different coloured sketch pens to demarcate functional areas of front office department.
- **Activity II:** Students should collect pictures of lobby of different hotels and prepare a collage out of it for display in the practical class room.
- **Activity III:** Students should individually, visit the lobby of a nearby hotel and share their experiences in the class room.

Unit–6: **5**

- **Activity I:** Students to perform a role play highlighting the coordination among different departments of the hotel. Role play to be followed by a discussion on the topic.
- **Activity II:** A group of students to enact the role-play of morning meeting of the executives of the hotel and highlight the co-ordination among them for efficient functioning of the hotel.

Unit–7: **5**

- **Activity I:** Students should visit a nearby hotel and have a look at the equipments used for security purpose such as Metal detector, File alarm, smoke detector, CCTV, safety locker, etc.
- **Activity II:** Fire fighting demonstration by an expert for all the students.
- **Activity III:** First aid demonstration/training for all the students by an expert.
- **Activity IV:** Teacher to divide the students in groups. Each group to plan and act a role play on the handling of following emergency situations:
  a) Handling Guest Illness.
  b) Handling a Bomb Threat.
  c) Handling a Drunk Guest.

Unit–8: **5**

- **Activity I:** Assignment for the students to visit the websites of different hotels & hotel booking portals and discuss in class about their observations.
- **Activity II:** Role play on handling of reservation request over telephone and filling of reservation form.
- **Activity III:** Exercise in filling up booking diary.
- **Activity IV:** Exercise on Filling up of advance letting chart.
- **Activity V:** Exercise on filling up of density chart.
- **Activity VI:** Exercise on handling room reservation through Whitney system.
- **Activity VII:** Exercise on filling of cancellation/Amendment form.
- **Activity VIII:** Exercise on filling of Room Status Board.

CLASS–XI
ELECTIVE
INTRODUCTION TO TOURISM AND HOTEL INDUSTRY (754)
THEORY

Time: 3 Hours ***Marks: 60***

Unit–1: Tourism — 8

- Definition and Importance of Tourism and Tourist.
- Classification of Tourism.
- Component of Tourism Industry.
- Impacts of Tourism Industry .
  - (i) Environmental.
  - (ii) Economical .
  - (iii) Socio cultural.

Unit–2: Hotels — 10

- Introduction to hospitality industry and Definition of hotels.
- History and evolution of hotel industry.
- Classification of hotels.
  - (i) Size.
  - (ii) Star.
- Location and clientele.
  - (i) Supplementary accommodation.
  - (ii) Time share and condominium.
  - (iii) Single hotels and group hotel.

Unit–3: Communication — 8

- Definition of communication.
- Types of communication.
- Importance of communication.
- Barriers in communication.
- Communication in hospitality industry.

Unit–4: Grooming and Hygiene — 6

- Importance of grooming and hygiene in hospitality industry.
- Grooming standards for hospitality professional : Male and Female.

Unit–5: Role of Computers in Hospitality Industry — 6

Unit–6: Personality Traits Required for Front Office Personnel — 8

- Punctuality, pleasing personality, positive attitude, good communication skills, team work, patience, leadership qualities etc.

Unit–7: Abbreviations — 8

- Used in hospitality industry.

Unit–8: Assignments — 6

- Country, capital and currency of the world.
- Different countries' airlines and their codes.
- Different facilities available at airport.

- Various tourist destinations.
- Hotel chain properties.
- Benefits of computers.
- Wild life sanctuaries and national parks of India.
- Char 'Dham' of India.
- Major hill stations and beaches of India.
- Personality trait of front office personnel.

References:

- Hotel Front Office Training Manual: Sudhir Andrews.
- Hotel Front Office Operations & Management: Jatashankar R. Tiwari.
- Front Office Management: Sushil Kumar Bhatnagar.

PRACTICAL

Time: 2 Hours ***Marks: 40***

Unit–1: **5**

- Prepare a project on the conservation of energy resources that are getting affected with the various activities of Tourists.
- Students need to prepare a chart revealing the negative impacts of Tourism on the Environment.
- Visit different tourist destinations of your city and prepare a report by taking feedback from the visitors regarding improvements that are required at tourist destinations.
- Chart preparation on classification of tourism classification.
- Project work on environmental impact of tourism.

Unit–2: **5**

- Conduct a survey on any two profit-making and non-profit making businesses in the hospitality industry in your local area. Observe below mentioned points for both the businesses and compare them.
  (i) Food and beverage items served.
  (ii) Type of food service Décor of the establishment.
  (iii) No. of employees.
  (iv) Rate Range.
- Make a list of the top ten lodging operations in your community. Show their name, chain affiliation, no. of guest rooms, and rate range.
- Chart preparation on classification of hotels.

Unit–3: **5**

- Role play and identification of the type of communication involved in the below mentioned situations by the students:
  (i) Telephonic conversation between two friends.
  (ii) Circular taken out by the Front Office Manager.
  (iii) Person thinking in his mind and talking to himself.
  (iv) Group discussion among two or three persons.

(v) Instructions given by a Boss to his Junior.

(vi) Suggestions given by a Subordinate to his Senior about the improvements required at the work place.

(vii) Person transmitting message through facial expressions or gestures.

- Alone, or in group of five, make a list of the kinds of communication that you consider helpful and those you find causing hindrance while performing a work.

Unit–4: 5

- Role plays by students on the grooming standards of the following staff:

(i) Grooming standards of Chauffer evaluated by Bell captain.

(ii) Grooming standards of Bell boy evaluated by Lobby Manager.

(iii) Grooming standards of Guest Relations Executive evaluated by Duty Manager.

(iv) Imagine that you are the Front-office Manager of a hotel. What instruction would you give to your staff to ensure that they always look well groomed and in a presentable condition in front of the guest?

Unit–5: 5

- You are the Front-office Manager of a hotel. Recently, there have been a lot of complaints from guests that they had to wait for a very long time when checking out. Suggest what help you could do to solve the problem.
- There is a newly built hotel in your area. To the owner of a newly built hotel would you recommend him to install computers in the hotel or not.

Unit–6: 5

- Imagine that you are a guest in a hotel. To which attribute of an employee you would appreciate more.
- Assume that you are the Front-office Manager of a hotel. You are expecting a VIP guest who is about to arrive later in the afternoon. Explain what type of attributes having in an employee you will assign for handling VIP guest.
- Demonstration of personality traits required for front office personnel through role play.
- Perform role plays revealing the below mentioned important attributes of Front-office personnel.

(i) Punctuality.

(ii) Honesty.

(iii) Communication.

(iv) Courtesy.

- Role play of receiving a guest at main porch.
- Role play of welcoming a guest.
- Role play of receiving a guest at reception.

Unit–7: 10

- Prepare an assignment on Country, Capital and Currency of the world.
- Does a project work on different countries' Airlines and their Codes?
- Make an assignment on different facilities available at Airport.
- Neatly prepare an assignment on various tourist destinations in India.
- Prepare an assignment on five chain hotel properties operating in India and list 10 hotel properties of each chain along with their location.
- Make assignment on enumerating the benefits of computer in our day-to-day life.
- Neatly prepare an assignment on different wild life sanctuaries and National parks situated in India.

- With the help of pictures depict "Char Dham" of India and briefly introduce each of them.
- Make a project on major hill stations and beaches of India.
- Pick any one personality trait of front office personnel and illustrate it with the help of 50 words. Neatly depict it with the help of a picture.

CLASS–XI
GENERAL FOUNDATION COURSE (501)
(Common for Food Production, Food and Beverage Services, Bakery and Confectionery and Front Office Operations)

(Refer to page 8)

CLASS–XII
ELECTIVE
FRONT OFFICE OPERATIONS (753)
THEORY

Time: 3 Hours ***Marks: 60***

Unit–1: Guest Cycle — 10

- Pre-arrival.
- Arrival.
- During Stay.
- Departure.
- Post-departure Activities.

Unit–2: Reception — 8

- Importance of Registration.
- Receiving of Guest.
- Pre-registration Activities.
- Registration Activities.
- Post-registration Activities.
- Registration of a Foreigner Guest.
- Room Selling Techniques.

Unit–3: Bell Desk — 8

- Functions.
- Equipment and Aids used in Bell Desk.
- Procedures of Bell Desk.

Unit–4: During the Stay Activities — 8

- Message Handling.
- Mail Handling.
- Key Handling.
- Complaint Handling.

Unit–5: Telephone **6**

- Telephone Manners & Etiquettes.
- Telephone Equipment.

Unit 6: Information and Concierge **7**

- Role and Importance.
- Competencies required.

Unit–7: Glossary **7**

Unit–8: Assignments **6**

References:

- Hotel Front Office Operations & Management: Jatashankar R. Tiwari.
- Front Office Operations: Colin Dix, Chris Baird.
- Front Office Management: Sushil Kumar Bhatnagar.
- Front Office Management & Operations: Sudhir Andrews.
- Front Office Operations & Management: RakeshPuri.

PRACTICAL

Time: 2 Hours ***Marks: 40***

Unit–1: Formats Used in Registration **4**

- Registration card.
- C-form.

Unit–2: Formats Used on Bell Desk **4**

- Errand card.
- VIP amenity voucher.

Unit–3: Role Play on Luggage Handling **4**

Unit–4: Chart for Bell Desk Equipments **4**

Unit–5: Role Play on Message and Mail Handling **4**

- Message.
- Incoming Mail.
- Outgoing Mail.

Unit–6: Role Play on Receiving a Guest and Filling up Necessary Formats **4**

- Etiquettes and manners.
- Role play on complaint handling.

Unit–7: Role Play on Telephone Handling **4**

- Conversation between a caller and the Telephone Operator.

Unit–8: Role Play on up Selling Techniques **4**

Unit–9: Situation Handling at the Concierge **4**

Unit–10: Quiz based on Glossary Terms **4**

- Reception.
- Bell desk.
- During the stay activities.
- Information & concierge.

CLASS–XII
ELECTIVE
ADVANCED FRONT OFFICE OPERATIONS (754)
THEORY

Time: 3 Hours ***Marks: 60***

Unit–1: Cashier **8**

- Role of Front Office Cashier.
- Functions & Procedures.
- Equipment used by Front Office Cashier.

Unit–2: Departure Procedure **10**

- Step by Step Process of Guest Check-out Modes of Settlement of Guest Folio.
- Cash.
- Credit card.
- Foreign currency.
- Travel Agent Voucher.
- Company Billing Letter.
- Travellers Cheque.
- Express Check-out.
- Late Check-out.

Unit–3: Front Office Accounting **8**

- Basics of Accounting.
- Folio and its Types.
- Voucher and its Types.
- Ledger
  - (i) Guest Ledger.
  - (ii) Non-guest Ledger.

Unit–4: Formats used in Manual Accounting System **6**

- Guest Weekly Bill.
- Visitors Tabular Ledger.

Unit–5: Role of PMS in Front Office Department **5**

- Role of Property Management System.

Unit–6: Front Office Reports **6**

Unit–7: Introduction to Night Audit Procedure in Front Office **6**

Unit–8: Glossary **5**

Unit–9: Assignments **6**

References:

- Check-In Check-Out Managing Hotel operations: Gary K. Vallen, Jerome J. Vallen.
- Principles of Hotel Front-Office Opeartions: Sue Baker, Jeremy Huyton, Pam Bradley.
- Hotel Front Office Operations & Management: Jatashankar R. Tiwari.
- Front Office Management: Sushil Kumar Bhatnagar.

PRACTICAL

Time: 2 Hours ***Marks: 40***

Unit–1: Filling up and Practice on Formats of Different Vouchers used in Accounting System **7**

- Paid-out vouchers.
- Correction vouchers.
- Transfer vouchers.
- Charge voucher.
- Allowance voucher.

Unit–2: Role Play of Express Check-out Process **6**

- Express check – out form.

Unit–3: Manual Practice of Accounting Procedure in non- Automated System **7**

- Guest weekly bill.
- Visitors tabular ledger.

Unit–4: Role - Play of Check out Procedure **7**

- By cash.
- By credit.
- Bill to Company.
- Foreign Currency.
- Travelers Cheque.

Unit–5: Role Play **7**

- Folio Postings.
- Night Auditing .
- Maintaining guest history.

Unit–6: Quiz based on Glossary Terms of Guest Accounting System **6**

CLASS–XII
GENERAL FOUNDATION COURSE (501)
(Common for Food Production, Food and Beverage Services, Bakery and Confectionery and Front Office Operations)

(Refer to page 13)

LIST OF RECOMMENDED BOOKS

1. Basis of Front Office, Class–XI, Published by CBSE.
2. Introduction to Tourism and Hotel Industry, Class–XI, Published by CBSE.
3. Managing Service in Food and Beverage Operations by Ronald F. Cichy.
4. Hotel Management and Operations, Third Edition by Denney G. Rutherford.
5. Hotel Design, Planning, and Development, New Edition by Walter A. Rutes.
6. The Professional Chef by Culinary Institute of America.
7. Front Office Operations & Management by Ahmed Ismail.

LIST OF EQUIPMENTS

1. Lobby Desk
2. Computer with Internet Facility
3. Printer
4. Property Management System
5. Foreign Currency Exchange Board
6. Credit Card Imprinter / EDC Machine
7. Luggage Rack
8. Luggage Trolley
9. Key Rack
10. Message Rack
11. Information Rack
12. Bell Desk
13. Reception Counter
14. Projector
15. Pen
16. Pencil
17. Ruler
18. Register
19. Note Pads
20. Sketch Pens

21. Charts

TRAVEL AND TOURISM

Preamble

- Tourism is the largest industry of the world. It is the sum of the phenomenon and relationship arising from travel and stay of non-residents in so far as they do not lend to permanent residence.
- Tourism is probably the first largest foreign exchange earner and therefore has unprecedential multiplier effect on development and economic change. Tourism singly can solve our balance of payment problem as witnessed and recorded in the case of several countries of Asia-Pacific. It is a fast emerging and developing industry, which has probably no match in the Indian industrial scenario.
- Tourism is the only subject which can provide complete knowledge of our great country i.e. our culture, traditions, our social history, hidden treasures of our country (natural beauty, monuments, places of pilgrimages etc.), development scenario and aspirations. Tourism is the passout for international understanding, peace and prosperity.
- Tourism has the largest potential for employment as compare to other sectors directly and indirectly. A balanced vocational oriented education to students is the need of the hour to satisfy the ever increasing demand of the modern tourism because at present tourism potential is very high and fast. Nature has gifted India with natural beauty, hill stations and the unique culture. The richness of our past with great landmark monuments and breathtaking scenic beauty are more important than the legendary Indian Hospitality which a tourist is bound to get. CBSE has taken a much desired step to meet this challenge in right direction by framing a curriculum for tourism education at the +2 stage.

CLASS–XI
ELECTIVE
TOURISM RESOURCES IN INDIA (756)
THEORY

Time: 3 Hours ***Marks: 60***

Unit–1: General Conceptual Survey — 7

- Introduction.
- Definition and Concept of Tourism Resources.
- Characteristics of Tourism Resources.
- Basis of Classification of Tourism Resources.
- Key Terms used in the unit.

Unit–2: Physical Tourism Resources - Mountains and Valleys — 4

- Introduction.
- Indian Himalayas.
- Aravali Mountain Ranges and Tourism.
- Western Ghats-Malabar (Sahyadri Mountains) and Tourism.
- Eastern Ghats (Coromondal Coast) and Tourism.
- Ten Stunning Mountain and Valley Attractions in India.
- Key Terms used in the unit.

Unit–3: Tourism Physical Resources-Hill Stations, Duns, Plaeaus, Desert, Wetlands and Plains **4**

- Introduction.
- Hill Stations and Duns in India.
- Hill Station of North-Eastern States (Manipur, Meghalaya, Nagaland, Sikkim, Tripura & Mizoram).
- Plateaus and Tourism.
- Plain and Tourism.
- Wet Lands, Ramsar Sites and Tourism.
- Key Terms used in the unit.

Unit–4: Tourism Physical Resources-Coastal Lands and Beaches **4**

- Introduction.
- Sea Shores.
- Beaches and Tourism.
- Key terms used in the unit.

Unit–5: Tourism Physical Resources-Islands **3**

- Introduction.
- Andaman and Nicobar Groups of Island.
- Lakshdwep Group of Islands.
- Majuli Islands.
- Other Islands of India.
- Key Terms used in the unit.

Unit–6: Tourism Physical Resources-Rivers, Lakes and Canals **16**

- Introduction.
- Major Rivers in India.
- Lakes and Canals Tourism in India.
- Key Terms used in the unit.

Unit–7: Tourism Bio Geographical Resources in India **6**

- Flora and Fauna of India.
- Eco Tourism.
- Wild Life Sanctuaries.
- Top Ten famous Bird Sanctuaries of India.
- Botanical Gardens in India.
- Key Terms used in the unit.

Unit–8: Tourism Cultural Resources in India **16**

- Introduction.
- Built up Tourism Cultural Resources.
- Religious Tourism Cultural Resources.
- Sport Resources.

- Conservatories of India.
- Entertainment Resources.
- India Cuisines as Tourism Resources.
- Art, Artifacts and Handlooms.
- Transportation Network and Tourist Infrastructure.
- Key Terms used in the unit.

PRACTICAL

Time: 2 Hours ***Marks: 40***

- Map Work: Identification, Demarcation and Plotting.
- A visit to a tourist site/ hotel.
- Teachers should teach students according to their Respective Regions.

CLASS–XI
ELECTIVE
TOURISM CONCEPTS AND PRACTICES (757)
THEORY

Time: 3 Hours ***Marks: 60***

Unit–1: Introduction to Tourism — 7

- Definition of Tourism.
- Elements of tourism – Man, time and space.
- Definition and differentiation - Tourist, travelers, visitor, transit visitor and excursionist.
- Leisure, recreation and tourism and their Interrelationship - Diagram.
- Characteristics of tourism – Service Characteristics, how to overcome service characteristics.
- Components of tourism – A's and S's of Tourism (Tourism resources, attractions, product, market, industry and destination).

Unit–2: Tourism: A Historical Account — 6

- Travel in early times.
- 'Renaissance' and 'Age of Grand Tours.
- Industrial revolution and tourism.
- Tourism in modern times.
- Tourism in India: an account – Rahul Sankalyan, Tirthatan, Deshartan, Paryatan, modern travel.
- Tourism circuits.

Unit–3: Concepts of Tourism — 8

- Tourism systems.
- Tourism Motivators
- Barriers to Tourism - Overcoming barriers to tourism.
- Forms of Tourism – In bound outbound, domestic (UNWTO – Diagram).

- Types of Tourism – Ethnic tourism, adventure tourism, rural tourism, eco-tourism, medical or health or wellness tourism, Sustainable tourism, etc.
- Types of Tour packages.
- Defining Tourism Impacts – Socio cultural, economic and environmental.

Unit–4: Tourism Components – I — 8

- Attraction – Resources, products, sites, destinations.
- Types of Attraction – man-made and symbiotic.
- Accessibility –Modes of Transportation and significance.
- Amenities: Health and hygiene, security.

Unit–5: Tourism Components – II — 8

- Significance of Accommodation.
- Types of Accommodation – Based on facilities, based on location, based on length of stay.
- Meal Plan of booking accommodation.
- Available packages – Short trip, weekend trip, long trip.
- Activities.
- Ancillary services – Guides, escorts, shopping for souvenirs, health services, documentation, telecommunication, Foreign Exchange.

Unit–6: Inter Linkage between Geography and Tourism Industry — 8

- Significance of Geography in tourism.
- Defining – Longitude, latitude, time calculation.
- Physical and Cultural Geography.
- Geographical features and their role in Tourism – Canyon, Hills, rivers, lakes, deserts, beaches etc. with examples.
- Map reading and cartography.
- Indian geography.

Unit–7: Inter Linkage between History and Tourism Industry — 8

- Significance and importance of History in tourism.
- Heritage Tourism – types, promotion.
- Defining – Heritage, historical sites, Archaeological sites.
- Guiding around Heritage sites.
- Role of ASI and ASI sites.
- World heritage sites in India.

Unit–8: Tourism Organizations and Trends — 7

- Defining the role of Ministry of Tourism Govt. of India.
- Defining the role of State Tourism Development Corporations.
- Public-private partnerships in tourism.
- Role of local bodies and NGO's.

- Functions of UNWTO, IATA, IATO, TAAI.
- Factors responsible for growth and development of tourism.
- General Trends in National & International Tourism trends.
- Emerging trends.

PRACTICAL

Time: 2 Hours ***Marks: 40***

- Computer Skills with access to computer for getting information related to tourism from internet as well as basic information from Windows and MS Office. **20**
- Project work based on newspaper and magazine cutting on tourism related news. **10**
- Role play with regard to information dispersal to guests / tourists. **10**

CLASS–XI
GENERAL FOUNDATION COURSE (501)

Time: 3 Hours ***Marks: 100***

Part–I: (Compulsory to all Vocational Courses) *Marks: 50*

A. Business Management and Entrepreneurship **30**

(a) **Entrepreneurship Orientation** **5**
Importance and relevance in real life: Emphasis on self employment.

(b) **Entrepreneurship Values and Attitudes** **5**
Innovativeness, Independence, Risk Taking, Analytical ability.

(c) **Entrepreneurial Motivation** **5**
Achievement Planning, personal efficacy, entrepreneurial goal setting.

(d) **Launching of a Business Venture** **15**
Identification of project, steps in setting up a business, information about various institutions providing assistance, project formulation.

B. Computational Skills **10**

(a) Percentage, ratio & proportion, profit & loss, discount, simple and compound interest, population growth and depreciation of value of articles using logarithm. **6**

(b) Area and volume: rectangle, parallelogram, circle, cube, cone, cylinder & sphere. **4**

C. Environmental Education **5**

(a) Environment and the society.

(b) Environment properties risks in different economic enterprises, in use of raw materials, in processing / manufacturing and designing.

(c) Poverty and environment.

D. Rural Development **5**

(a) Agriculture, the back bone of Indian Economy.

(b) Rural development projects in India including Integrated rural development programme.

(c) Agro based rural industries.

(d) Community approach to rural development.

Part–II

Marks: 50

1. Definition of Tourism and Travel.
2. Linkages between Leisure, Recreation and Tourism.
3. Types of Tourists and their motivations.
4. Destination and supply areas and their relationship.
5. World's best destinations and magnitude of tourist flow: motivation, realization and satisfaction.
6. Types of Tourism. Domestic v/s International Tourism. Determinanants and Catalyst of development, Social change and peace, Impart Assessment and Future Trends.
7. Tourism promotion, organisation and impact.
8. India as a destination: India is not only Tajmahal but there are other hidden treasures of Tourist interests.
9. India's Tourism: Types and places of Tourist interest in India.
10. Steps to promote Tourism and form of concessions like Leave Travel Concession (LTC).
11. Cost and benefit of Tourism.
12. Tourism Marketing Practices in India and their impact.
13. Suggested strategies.
14. Write notes on WATA, UFTAA, UTDC, ITDC, TAAI, WTO, IATA, State Tourism, HPTDC, UTDC, PTDC, Indian Airlines, Air India, Airport Authority of India.
15. Private Agencies and promotion of Tourism and Travel facilities.

CLASS XII
ELECTIVE
INTRODUCTION TO HOSPITALITY MANAGEMENT (756)
THEORY

Time: 3 Hours ***Marks: 60***

Unit–1: Introduction to Hospitality Management — 7

- Meaning, concept, origin and development of hospitality industry. Importance of customer care in hospitality & Eco friendly practices in hospitality.
- Concept of Ecotels. Famous hotel chains in India and worldwide. Role of hospitality industry in tourism.

Unit–2: Organisational Structure of Hotel — 6

- The important functional departments of the hotel, their functions, Organizational chart of hotels (Large, Medium, Small) Facilities provided in hotels.

Unit–3: Classification of Hotel — 8

- Room Types & Tariffs - Types of rooms, Food/Meal plans, Types of room rates. (Rack, FIT, crew, group, corporate, weekend etc.), Classification of hotels (based on various categories like size, location, clientele, length of stay, facilities, ownership) Registration and gradation of hotels.

Unit–4: Distribution Channel 8

- Meaning and definition of hospitality distribution channels, functions and levels of distribution channels, basics of major hospitality distribution channels-travel agents, tour operators, consortia and reservation system.

Unit–5: Introduction to Front Office Division 8

- Front Office department and its functions, Sections and layout of Front Office, Organizational chart of front office department (small, medium and large hotels), Duties and responsibilities of various staff, The guest cycle, Property management systems, Attributes of front office personnel, Co-ordination of front office with other departments of the hotel. The organization structure of rooms division.

Unit–6: Front Office Services 8

- Equipments used (Manual and Automated), Role of Front Office- Key control and key handling procedures, Mail and message handling , Paging and luggage handling, Rules of the house (for guest and staff) , Black list, Bell Desk and Concierge

Unit–7: Front Office Communication and other Attributes 8

- Communication Fundamentals- Telephone etiquettes, Important terminology used in hotels Professional Attributes- Attitude towards your job, Personal Hygiene, Uniforms, Care for your own health & safety.

Unit–8: Front Office and Guest Safety and Security 7

- Safety practices & procedures- Accidents, types, nature, classification, Preventive measures for each type of accident, Reporting accidents, First aid - meaning, importance, and basic rules. Fire Prevention.

PRACTICAL

Time: 2 Hours ***Marks: 40***

Front Office (Identification of various vouchers): The students will have to draw one or two of the following vouchers and according to the case study fill up the vouchers (desk work). **10**

- Registration Card.
- Reservation Form.
- Amendment Slip.
- Cancellation Slip.
- Arrival/departure notification slip.
- VIP amenities voucher.
- Miscellaneous charge voucher.
- Allowance voucher.
- Paid out voucher.
- Message slip.
- Guest Folio.

(i) Telephone etiquettes and manners. **10**

(ii) Front desk grooming and other essentials – body language, speech modulation which includes articulation, variation control of pitch and tonal quality. **10**

(iii) Role play: Guest Check-in and check-out procedures for FIT's/GIT's/Crews etc. (The student should be able to handle the entire procedure independently), Luggage handling procedures on guest arrival/departure, Scanty Baggage procedures, Left Luggage procedures, Safety locker procedures, Calculation of various occupancies & revenue. **10**

CLASS–XII
ELECTIVE
TRAVEL AGENCY AND TOUR OPERATIONS BUSINESS (757)
THEORY

Time: 3 Hours ***Marks: 60***

Unit–1: Introduction to Travel & Tourism Business **8**

- Evolution of Travel Business.
- Travel Trade in India.
  - (i) Meaning and Concept of Travel business.
- Travel Agency.
  - (i) Types of travel agencies.
- Tour operator.
  - (i) Types of tour operators.
- Difference between Travel Agency and Tour Operator.
- Organizational structure of a travel/tour company.
- Market Trends and TA business scenario.
- Business Integration.

Unit–2: Operations of Travel Agency **8**

- Agent.
- Origins of travel agency.
  - (i) Operations of travel agency.
  - (ii) Organization of travel agency.
- Commissions.
  - (i) Types of agencies.
- Travel agencies in the 21st Century.

Unit–3: Transport Network **7**

- Transportation.
  - (i) Tourism and Transport.
- Air Transport.
- Rail Transport.
- Road Transport.
- Shipping.
- Mass Transportation.

Unit–4: Itinerary Planning **8**

- Itinerary planning.

(i) Importance of travel itinerary.

(ii) Types of tour itinerary.

(iii) Pre-requisites of itinerary preparation.

(iv) Things to be considered while preparing itinerary.

(v) Step by step procedure.

(vi) Do's and don'ts of itinerary preparation.

- GIT and FIT.
- Package or inclusive tours.

Unit–5: Tour Packaging & Programming — 10

- Meaning and Classifications of Tour Packages.
- Components of Package.
- Customized and Tailor-Made Package.
- Tour Formulation & Designing Process.
- Tour Brochure Designing.
- Tour Programming and its Importance.

Unit–6: Package Tour Costing — 7

- Meaning and Types of Cost.
- Concept of Tour Costing.

(i) Types of cost.

(ii) Preparation of Cost Sheet.

- Components of Tour Cost.
- Pricing package tour.
- Pricing strategies.

Unit–7: Government and Professional Bodies — 6

- Components of tourism.
- Integration between government and professional bodies.
- Rules for Setting up Travel Agencies & Tour operator.
- Department of tourism (DoT) Different schemes and policies.
- Professional bodies and their activities.

Unit–8: Global Distribution System — 6

- Global distribution system (GDS).
- Evolution of GDS.
- Amadeus and GDS.
- Display Airlines Schedules & Availability.

PRACTICAL

Time: 2 Hours *Marks: 40*

1. Plotting on World Map - countries and Cities.
2. Plotting on World Map - Air Routes.
3. Visit to Travel Agency- Prepare a report.
4. Visit to local tourist attraction- Prepare a report.
5. Preparation of package tour.
6. Report writing on current events of Tour and Airway Business.

CLASS–XII
GENERAL FOUNDATION COURSE (501)

Time: 3 Hours *Marks: 100*

Part–I: (Compulsory to all Vocational Courses) *Marks: 50*

A. Business Management and Entrepreneurship 30

Management of Business

Elementary treatment/exposure to basic conceptual frame work of the topic listed below:

(a)= Basic Function. **6**

(b) Marketing Management. **6**

(c) Financial Management. **6**

(d) Production Management. **6**

(e) Personnel Management. **6**

B. Computational Skills 10

1. (a) Solution of linear equations and their application to problem of commercial mathematics. **5**

   (b) System of linear equations and in equation in two variables. Applications in formation of simple linear programming problems.

2. Statistics: Raw data, bar charts and Histogram; Frequency Tables; Frequency Polygon; Ogive; Menu, Median and Mode of ungrouped and grouped data; Standard Deviation; Introduction to Mortality tables; Price Index etc. Introduction to Computers. **5**

C. Environmental Education & Rural Development 10

1. **Environmental Education** **5**

   (a) Modernisation of agriculture and environment, irrigation, water logging, use of fertilisers, pesticides, soil erosion, land degradation (desertification and deforestation), silting and drying of water resources.

   (b) Rational utilisation, conservation and regeneration of environmental resources (soil, air, water, plant, energy, minerals).

2. **Rural Development** **5**

   Principles and goals of rural development, major problems/constraints in rural development in India.

Part–II *Marks: 50*

Writing of a Project Report of 50 marks is compulsory. Selection of topics/themes for the project report should be such that the students apply and test their knowledge acquired through the courses which they have attended. The following themes are suggested. However, the teacher concerned has the freedom to modify the suggested

themes.

A. 1. Tourist Products of India - anyone.
2. National Parks and Wildlife Sanctuaries.
3. Architecture of India.
4. Visitor's service and amenities and tourism promotion.
5. Packaging of Tourist Products of India.
6. Role of Govt. and private agencies in tourism promotion.
7. Tourism impact analysis.

B. 1. Transport and tourism linkages.
2. Indian Railways and tourism.
3. Role of Air India and Indian Airlines.
4. Road Transport and tourism development.
5. Itinerary planning and development.

C. 1. Marketing strategy for India as a tourist product.
2. Tourism administration.
3. Human resource development for tourism.

LIST OF RECOMMENDED BOOKS

1. Tourism Concepts and Practices, Class–XI, Published by CBSE.
2. Tourism Resources in India, Class–XI, Published by CBSE.
3. Travel Agency and Tour Operation Business, Class–XII, Published by CBSE.
4. Introduction to Hospitality Management, Class–XI, Published by CBSE.
5. Introduction to Tourism-II, Class–X, Published by CBSE.
6. Introduction to Tourism–I, Class–IX, Published by CBSE.
7. Foster, Dennist L., The Business of Travel Agency Operations and Administration (1993), Macmillan/McGraw Hill, Singapore.
8. Mill, R.C. and A.M. Morrison, The Tourism System – An Introductory Text (1992).
9. Medlik, S., Managing Tourism (1991), Heinemann, London.
10. Christie Mill, R., Tourism: The International Business.
11. Holloway, J.C. and R.V. Plant, Marketing for Tourism (1992), Pitman, London.
12. Chakarvarti, A.K., Railways for Development Countries, 1982, New Delhi.
13. Curran, Patrick, Principles and Procedures of Tour Management, 1975.
14. Khan, R.R., Transport Management, Bombay, 1980.
15. Chuck, Y.G., a, 1994, The Travel Industry, Westport, U.S.A.
16. Daridoff, P.G. and Davidoff, D.S., 1983, Sales & Marketing for Travel and Tourism, South Dakota, U.S.A.
17. Donald, W.C., 1984, Marketing of Services, London.
18. Foster, D., 1985, Travel and Tourism Management, London.
19. Jefferson, A. and Lickorish, L., 1988. Marketing Tourism a Practical Guide, New York.
20. Adele Hodqsm (ed.) 1987, The Travel and Tourism Industry – Strategy for Future, New York.
21. Betsy, R., 1991. Essentials of Tour Management, New Jersey.

22. Chile, S.N., 1989, Essays in Tourism, New Delhi.
23. Geoff Growth & 1990, India, A Travel Sunval Kit, New York.

LIST Of EQUIPMENTS

		Quantity
1.	**Interior Designing**	
	Wall Treatment.	
	Window Curtains / Blinds.	
	Carpets.	
	Light Fitting.	
2.	**Furniture / Travel Desk**	
	Tables	. 2
	Chairs (Revolving).	2
	Visitors Chairs.	6
	Sofa set with Coffee Table.	1 Set
	Cup Board.	2
3.	**Monitor / CPU / UPS / Key Board / Mouse / Camera / Head Set / Printer**	1
	Television.	1
	LCD Projector with Sound System.	1
	Telephone.	1
4.	**Boards**	
	Sign Board.	5
	Currency Exchange rate Board.	1
	Notice Board.	1
	Display Board (Country / Airline / Currency / Capital).	1
	Laminated Maps, Foldable Map (World / India Political / Tourist Route)	3
	Display of Currency Board.	1
	Globe (Large).	1
	Clock (for displaying various country times).	7
	Poster Laminates.	4
	Large Flower Vase with Flowers.	1
5.	**Material (Hard / Soft)**	
	Lonely planet of world and different major tourism based countries.	
	Virtual tour of various states in CD format.	
	Foreign Currency of Major Countries (to display only)	

SECURITY

CLASS–XI
ELECTIVE
SECURITY (800)
THEORY

Time: 2.5 Hours + 2.5 Hours

Total Marks: 100
Theory: 50 Marks
Practical: 50 Marks

Unit–1: Advanced Defensive Techniques

Common self-defense techniques, physical fitness, basic techniques of Krav Maga, Principles and techniques of unarmed combat in protection of very important person, role of security team in VIP protection.

Unit–2: Managing Conflict at Workplace

Causes and symptoms of conflict, conflict at work, Knowledge of valuing and attitude as Tactics for mitigating conflicts.

Unit–3: Legal and Procedural requirements in Security Services (Advanced)

Investigate and report untoward incidents or accidents, Perform Various actions for controlling and managing a crowd, Recognize sections of Indian Penal Code for legal protection to Security Personnel, Recognize sections of Indian Penal Code for offenses against human body and property, Recognize sections under Criminal Procedure Code for arresting a person under Indian Penal Code, Demonstrate the ability to lodge First Information Report.

Unit–4: Managing Visitors

Meet visitor and security requirements, Manage Waiting period of visitors, Deal with emotionally disturbed visitors.

Unit–5: Maintaining Lost and Found Facility

Prepare a layout for setting up a Lost and Found Facility, Receive report and complaints of lost and found articles, Manage and deliver found articles, Manage lost child or person.

Unit–6: Dealing with Anxiety and Stress

Recognize signs and causes of anxiety and stress, Identify signs of job stress, Manage Stress.

Unit–7: Work Integrated Learning - Security Services-L3

Recognize Security threats in modern society, Identify security threats to India, Describe the reasons for wars fought by India after independence, Describe the organizational structure of public security in India.

Note: Practical will be based on aforesaid theory paper.

CLASS–XII
ELECTIVE
SECURITY (800)
THEORY

Time: 2.5 Hours + 2.5 Hours

Total Marks: 100
Theory: 50 Marks
Practical: 50 Marks

Unit–1: Security of Premises and Property

Demonstrate the knowledge of Responsibilities involved in perimeter security, Demonstrate the knowledge and skills for the use of access control system, Identify the various documents used in access control, Demonstrate the knowledge of parameters for screening and searching people and vehicles, Manage incidents during screening and search, Describe the responsibilities and procedures involved in gate control.**7**

Unit–2: Introduction to Technological Aids in Security Operations

Describe the various types of access control system and equipment, Demonstrate the knowledge of scanning and frisking, Identify the various parts and demonstrate the knowledge of CCTV equipment, Demonstrate the knowledge and skill of using Public Address System. **7**

Unit–3: Legal and Procedural Requirement in Private Security Sector (Advanced)

Demonstrate the knowledge of laws related to self defence and arrest, Describe Special Acts which address security issues, Demonstrate the knowledge of provisions made for training under the PSA (R) Act and Rules thereof, Demonstrate the knowledge of the provision made for verifications as per PSA (R) Act and Rules thereof, Demonstrate the knowledge of various provisions related to service conditions of Private Security Personnel under PSA (R) Act 2005. **7**

Unit–4: Basic Security Operations

Demonstrate the knowledge of different types of patrol, Describe the planning and preparations of patrols, Identify the limits of responsibility and authority of patrolling team, Deal with various types of crowd, Demonstrate the knowledge and ability to control crowd, Identify the behaviour and appropriate measures for controlling unruly crowds. **7**

Unit–5: Security through Surveillance and Protection Systems

Demonstrate the knowledge of visitor information recording, demonstrate the knowledge to monitor visitor's through surveillance systems, managing the visitors' material, and demonstrate the knowledge of the use of security surveillance and protection system. **7**

Unit–6: Responding to Security Incidents and Breaches

Handle security Incidents and services, Deal with threat situations of suspected explosives, bombs and Improvised Explosive Device (IED). **7**

Unit–7: Work Integrated Learning

Demonstrate the knowledge of security survey and audit, Demonstrate the knowledge of customer relationship management, Demonstrate gender and cultural sensitivity, Demonstrate the knowledge of

Corporate Social Responsibility insecurity service, Demonstrate the ability to apply concepts of environment protection and conservation insecurity system. **8**

Note: Practical will be based on aforesaid theory paper.

LIST OF RECOMMENDED BOOKS

1. Resource Material developed by PSSCIVE, Bhopal on Security (Level I, II, III, IV) for Classes IX, X, XI and XII.

LIST OF TOOLS, EQUIPMENTS & MATERIAL

The list given below is suggestive and an exhaustive list should be prepared by the teacher. Only basic tools, equipment and accessories should be procured by the institution so that the routine tasks can be performed by the students regularly by the institution so that the routine tasks can be performed by the students regularly for practice and acquiring adequate practical experience.

1. Torch Light.
2. Batons.
3. Handcuffs.
4. Boots.
5. Security Guard Belts.
6. Notebook.
7. Pen.
8. Spare Batteries and Bulbs.
9. Two way Radios and Chargers.
10. Safety Helmets.
11. Duty Uniform.
12. Clock.
13. Telephone.
14. Key Boards.
15. Fire Extinguishers.
16. Parking Signs.
17. Alarm Panels.
18. Padlocks Together with Chains.
19. Rope.
20. Emergency Warming Lights.
21. Emergency Flood Lights.
22. Smoke Detectors.
23. First Aid Equipment.
24. First Aid Kit.

Annexure–1

APPLICATION FORMAT FOR OFFERING VOCATIONAL SUBJECT / COURSES AT SENIOR SECONDARY LEVEL

1. **Name of the Course(s) applied for:** .....
   (with subject codes) .....
   .....
   .....

2. **Name of the School (Complete address)** .....
   (Also provide Website address if available) .....
   .....
   .....

3. **Affiliation No.** .....
4. **School ID.** .....
5. **Name of the Principal** .....
   - Phone No. .....
   - Mobile No. .....
   - E-mail .....
6. **Infrastructure** .....
   No. of Students .....
   No. of Teachers .....
   Student-Teacher Ratio .....
   No. of Classrooms .....
   Books in Library .....
   Total Computers in Computers Labs .....
   Specification of Computers .....
   Details of Constructed area for .....
   Establishing Laboratories .....
7. **Name of Teachers for Vocational Course** .....
   (Qualifications) .....
   .....
   .....

8. **Details of Draft** (in favour of **Secretary, CBSE,** Payable at Delhi)
   DD No.: ..... Date: ..... **Amount** (in Digits)
   .....
   Bank Issues: ..... **Amount** (in Words)
   .....

Signature & Seal of the Principal

Note: The document complete in all respects may be sent to: **The Director (Vocational Education), Central Board of Secondary Education 2, Community Center, Preet Vihar, New Delhi-110092.**

Applied Physics (625) Class XI

Time 3hrs. Marks 60

1. **Units & Dimensions:** M.K.S. fundamentals & derived units, S.I. base units supplementary units and derived units, Dimensions of various physical quantities, uses of dimensional analysis.
2. **Surface Tension and Viscosity:** molecular forces, molecular theory of surface tension, surface energy, capillary action, concept of viscosity, coefficient of viscosity, principle and construction of viscometers. **2**
3. **Vibrations:** Vibration as simple spring mass system, elementary and qualitative concept of free and forced vibrations, resonance. Effects of vibrations on building bridges and machines members.
4. **Heat:** Temperature and its measurement, thermoelectric, platinum resistance thermometers and pyrometers. Conduction through compound media and laws of radiations.
5. **Ultrasonics:** Productions of ultrasonic waves by magnetostriction and piezo-electric effect, application of ultrasonics in industry.
6. **Optics:** Nature of light, reflection and refraction of a wave from a plane surface. Overhead projector and Epidiascope.

Applied Physics (Practical)

Time 1hr. Marks 40

1. To determine the surface tension of a liquid by rise in capillary.
2. To determine the viscosity of a given liquid.
3. To determine the frequency of tuning fork using a sonometer.
4. To determine the frequency of AC main using sonometer.

Applied Physics (625) Class XII

Time 3 hrs. Marks 60

1. **Electrostatics:** Coloumb's law, electric field, potential, electric flux, gauss theorem and the electric field, around a charged sphere, a long straight conductor and plane charged sheet, potential difference, and potential of a charged sphere and a point charge, principle of capacitor, capacitance of a parallel plate capacitor having a number of media, energy stored in capacitor and combination of capacitor.
2. **Electromagnetism:** Magnetic field around a current carrying conductor and its direction, concept of B & H and permeability, force experienced by a moving charge and current carrying conductor placed in a magnetic field. Magnetic field at the centre of a circular coil, straight conductor and solenoid.
3. **Nuclear Physics:** Nuclear fission and fusion, use of radio isotopes, the application of nuclear fission in nuclear power station, nuclear fuels, radiation hazard.
4. **Basic Electronics:** Semi conductors and their resistivity. Atomic structure of Ge & Si, P & N type materials, formation of P-N and N-P junctions, forward and backward raising working of semiconductor diode, and its application in half wave and full wave rectifiers, P-N-P and N-P-N transistors and their principles of working.

Applied Physics (Practical)

Time 1hr. Marks 40

1. Draw forward and reverse characteristics of P & N junctions.
2. To find resistivity of a given metal by using meter-bridge.
3. To compare e.m.f. of two cells by using a potentiometer.
4. To determine 'K' of a bad conductor.
5. To determine 'K' of a good conductor.
6. Time period of a cantilever.