

Marking Scheme Strictly Confidential (For Internal and Restricted use only) Senior Secondary Supplementary School Examination, 2026 (XIIth) SUBJECT NAME- INFORMATION TECHNOLOGY (Q.P. CODE /Set No - 326/7 ,Set - 4)	
<u>General Instructions: -</u>	
(a)	You are aware that evaluation is the most important process in the actual and correct assessment of the candidates. A small mistake in evaluation may lead to serious problems which may affect the future of the candidates, education system and teaching profession. To avoid mistakes, it is requested that before starting evaluation, you must read and understand the spot evaluation guidelines carefully.
(b)	“Evaluation policy is a confidential policy as it is related to the confidentiality of the examinations conducted, evaluation done and several other aspects. Its leakage to public in any manner could lead to derailment of the examination system and affect the life and future of millions of candidates. Sharing this policy/document to anyone, publishing in any magazine and printing in Newspaper/Website, etc. may invite action under various rules of the Board and IPC.”
(c)	Evaluation is to be done as per instructions provided in the Marking Scheme. It should not be done according to one's own interpretation or any other consideration. Marking Scheme should be strictly adhered to and religiously followed. However, while evaluating, answers which are based on latest information or knowledge and/or are innovative, they may be assessed for their correctness otherwise and due marks be awarded to them. In Class-XII, while evaluating two competency-based questions, please try to understand given answer and even if reply is not from marking scheme but correct competency is enumerated by the candidate, due marks should be awarded.
(d)	The Marking scheme carries only suggested value points for the answers. These are in the nature of Guidelines only and do not constitute the complete answer. The students can have their own expression and if the expression is correct, the due marks should be awarded accordingly.
(e)	The Head-Examiner must go through the first five answer books evaluated by each evaluator on the first day, to ensure that evaluation has been carried out as per the instructions given in the Marking Scheme. If there is any variation, the same should be zero after deliberation and discussion. The remaining answer books meant for evaluation shall be given only after ensuring that there is no significant variation in the marking of individual evaluators.
(f)	Evaluators will mark (✓) wherever answer is correct. For wrong answer CROSS 'X' be marked. Evaluators will not put right (✓) while evaluating which gives an impression that answer is correct and no marks are awarded. This is most common mistake which evaluators are committing.
(g)	If a question has parts, please award marks on the right-hand side for each part. Marks awarded for different parts of the question should then be totaled up and written in the left-hand margin and encircled. This may be followed strictly.
(h)	If a question does not have any parts, marks must be awarded in the left-hand margin and encircled. This may also be followed strictly.
(i)	If a student has attempted an extra question, answer of the question deserving more marks should be retained and the other answer scored out with a note “Extra Question” .

(j)	No marks to be deducted for the cumulative effect of an error. It should be penalized only once.
(k)	A full scale of marks _____ (example 0 to 80/70/60/50/40/30 marks as given in Question Paper) has to be used. Please do not hesitate to award full marks if the answer deserves it.
(l)	Every examiner has to necessarily do evaluation work for full working hours i.e., 8 hours every day and evaluate 20 answer books per day in main subjects and 25 answer books per day in other subjects (Details are given in Spot Guidelines). This is in view of the reduced syllabus and number of questions in question paper.
(m)	Ensure that you do not make the following common types of errors committed by the Examiner in the past :- • Leaving answer or part thereof unassessed in an answer book. • Giving more marks for an answer than assigned to it. • Wrong totaling of marks awarded on an answer. • Wrong transfer of marks from the inside pages of the answer book to the title page. • Wrong question wise totaling on the title page. • Wrong totaling of marks of the two columns on the title page. • Wrong grand total. • Marks in words and figures not tallying/not same. • Wrong transfer of marks from the answer book to online award list. • Answers marked as correct, but marks not awarded. (Ensure that the right tick mark is correctly and clearly indicated. It should merely be a line. Same is with the X for incorrect answer.) • Half or a part of answer marked correct and the rest as wrong, but no marks awarded.
(n)	While evaluating the answer books if the answer is found to be totally incorrect, it should be marked as cross (X) and awarded zero (0) Marks.
(o)	Any unassessed portion, non-carrying over of marks to the title page, or totaling error detected by the candidate shall damage the prestige of all the personnel engaged in the evaluation work as also of the Board. Hence, in order to uphold the prestige of all concerned, it is again reiterated that the instructions be followed meticulously and judiciously.
(p)	The Examiners should acquaint themselves with the guidelines given in the “Guidelines for Spot Evaluation” before starting the actual evaluation.
(q)	Every Examiner shall also ensure that all the answers are evaluated, marks carried over to the title page, correctly totaled and written in figures and words.
(r)	The candidates are entitled to obtain photocopy of the Answer Book on request on payment of the prescribed processing fee. All Examiners/Additional Head Examiners/Head Examiners are once again reminded that they must ensure that evaluation is carried out strictly as per value points for each answer as given in the Marking Scheme.

MARKING SCHEME
Senior Secondary School Examination, 2026
INFORMATION TECHNOLOGY (Subject Code–802)
[Paper Code:326/7]

Time allowed: 3 Hours

Maximum Marks: 60

General Instructions:

- (i) Please read the instructions carefully.
- (ii) This question paper consists of **24** questions in **two** Sections : **Section A** and **Section B**.
- (iii) **Section A** has Objective Type Questions, whereas **Section B** contains Subjective Type Questions.
- (iv) Out of the given $(6 + 18) = 24$ questions, a candidate has to answer $(6 + 11) = 17$ questions in the allotted (maximum) time of 3 hours.
- (v) All questions of a particular section must be attempted in the correct order.
- (vi) **Section A : Objective Type Questions (30 marks) :**
 - (a) This section has **6** questions.
 - (b) There is no negative marking.
 - (c) Do as per the instructions given.
 - (d) Marks allotted are mentioned against each question / part.
- (vii) **Section B : Subjective Type Questions (30 marks) :**
 - (a) This section has **18** questions.
 - (b) A candidate has to do **11** questions.
 - (c) Do as per the instructions given.
 - (d) Marks allotted are mentioned against each question / part.

SECTION A
(Objective Type Questions) (30 Marks)

1		Answer any 4 out of the given 6 questions on Employability Skills.	4x1=4
	(i)	What is a sentence? (A) A group of ideas that form a complete paragraph. (B) A group of words that communicates a complete thought or meaning. (C) A set of rules that we must follow to write correctly. (D) A set of words that contains basic punctuation marks.	
	Ans	(B) OR A group of words that communicates a complete thought or meaning. (1 Mark for the correct answer)	
	(ii)	Define the term “stress”.	

	Ans	Stress is a state of feeling upset, annoyed and hopeless. OR There are times when we feel nothing is working right; we are not able to achieve our goals and feel hopeless. (1 Mark for any correct / relevant definition)	
	(iii)	Cluster 'A' personality disorders are associated with individuals who are _____ in nature. (A) Suspicious (B) Emotional (C) Impulsive (D) Anxious	
	Ans	(A) OR Suspicious (1 Mark for the correct answer)	
	(iv)	ICT stands for: (A) Innovation and Coordination Team (B) Information and Communication Technology (C) Integrated and Clear Technology (D) Inspired and Creative Team	
	Ans	(B) OR Information and Communication Technology (1 Mark for the correct answer)	
	(v)	Which of the following is not a component of a spreadsheet? (A) Cell (B) Worksheet (C) Workbook (D) Workarea	
	Ans	(D) OR Workarea (1 Mark for the correct answer)	

	(vi)	Name the flagship initiative of the Government of India that is intended to build an ecosystem for the growth of start-up businesses.	
	Ans	‘Startup India’ <i>(1 Mark for the correct answer)</i>	
2		Answer any 5 out of the given 7 questions.	5 x 1=5
	(i)	The description of data stored in a DBMS is called: (A) Database State (B) Metadata (C) Database Schema (D) Tuple	
	Ans	(B) OR Metadata <i>(1 Mark for the correct answer)</i>	
	(ii)	A company named Alpha Innovations maintains a database of its employees. The database includes a table Employee , which stores a single record for each employee. The table contains the following columns : EmployeeID, Name, Department, Salary, Email, PhoneNumber, Address, and DateofJoining . The company currently has 91 employees. Based on the above information, what is the cardinality and degree of the Employee table? (A) Cardinality = 8, Degree = 91 (B) Cardinality = 91, Degree = 8 (C) Cardinality = 91, Degree = 91 (D) Cardinality = 8, Degree = 8	
	Ans	(B) OR Cardinality = 91, Degree = 8 <i>(1 Mark for the correct answer)</i>	
	(iii)	Which of the following correctly defines a DBMS? (A) It is a programming language (B) It is a hardware component for data processing (C) It is a collection of programs for managing databases (D) It is an antivirus software	

	Ans	(C) OR It is a collection of programs for managing databases <i>(1 Mark for the correct answer)</i>	
	(iv)	What does 'd' represent while using the data type DECIMAL (m, d) ? (A) The total number of digits in the number. (B) The number of digits after the decimal point. (C) The default value of the column. (D) The degree of the relation.	
	Ans	(B) OR The number of digits after the decimal point. <i>(1 Mark for the correct answer)</i>	
	(v)	State True or False: Online interactive tutorials require the user to follow the instructions, perform the desired action and get feedback.	
	Ans	True <i>(1 Mark for the correct answer)</i>	
	(vi)	During the “Requirement Definition Phase” of a web application project, what is the primary purpose of conducting a “Feasibility” check ? (A) To design the structure of the database tables. (B) To determine if the project is technically possible and economically profitable. (C) To write the SQL code for the backend. (D) To find and fix bugs in the front-end interface.	
	Ans	(B) OR To determine if the project is technically possible and economically profitable. <i>(1 Mark for the correct answer)</i>	
	(vii)	What does the Java Virtual Machine (JVM) do? (A) It translates high-level Java code directly into machine language. (B) It translates Java Bytecode into machine code. (C) It is a text editor used for writing Java code. (D) It bundles the compiler and text editor into a single application.	

	Ans	(B) OR It translates Java Bytecode into machine code. <i>(1 Mark for the correct answer)</i>	
3		Answer any 6 out of the given 7 questions.	6x1 = 6
	(i)	A company is developing an employee management system software. While designing the database, the developer wants to ensure that whenever a new employee record is inserted without specifying a salary, the system should automatically assign a salary of 75000 . Which SQL constraint should be used to achieve this requirement? (A) NOT NULL (B) CHECK (C) UNIQUE (D) DEFAULT	
	Ans	(D) OR DEFAULT <i>(1 Mark for the correct answer)</i>	
	(ii)	Which ON DELETE action automatically deletes all records in the referencing table whose foreign key values match the primary key of a deleted record in the referenced table? (A) SET NULL (B) RESTRICT (C) CASCADE (D) NO ACTION	
	Ans	(C) OR CASCADE <i>(1 Mark for the correct answer)</i>	
	(iii)	What is the key distinction between the “Design Phase” and the “Implementation Phase” in project management? (A) Design focuses on “what” the application must do; Implementation focuses on “how”. (B) Design focuses on “how” the application is to be designed; Implementation focuses on creating the actual database and frontend. (C) Design is about testing for bugs; Implementation is about identifying the problem statement. (D) There is no distinction; they are the same phase.	

	Ans	(B) OR Design focuses on “how” the application is to be designed; Implementation focuses on creating the actual database and frontend. <i>(1 Mark for the correct answer)</i>	
	(iv)	What is the full form of NeGP? (A) National e-Government Programme (B) National e-Governance Plan (C) New e-Government Project (D) National Electronic Governance Program	
	Ans	(B) OR National e-Governance Plan <i>(1 Mark for the correct answer)</i>	
	(v)	When registering for an account on the IRCTC website, how are mandatory fields identified on the registration form? (A) They are highlighted in red. (B) They are written in bold capital letters. (C) They are marked with a star (*). (D) They are the only fields that can be typed in.	
	Ans	(C) OR They are marked with a star (*). <i>(1 Mark for the correct answer)</i>	
	(vi)	Which line of code correctly declares an array of integers in Java? (A) <code>int[] marks;</code> (B) <code>integer marks[5];</code> (C) <code>array<int> marks;</code> (D) <code>int marks = new int();</code>	
	Ans	A OR <code>int[] marks;</code> <i>(1 Mark for the correct answer)</i>	

	(vii)	What is the purpose of the break statement within a switch block? (A) It terminates the switch statement and continues execution of the statement following the switch. (B) It stops the entire program. (C) It skips the current case and moves to the next one. (D) It indicates a syntax error.	
	Ans	(A) OR It terminates the switch statement and continues execution of the statement following the switch. <i>(1 Mark for the correct answer)</i>	
4		Answer any 5 out of the given 6 questions.	5x1=5
	(i)	A librarian is using a database to search for book titles. She wants to find all titles that start with the letter 'S' and have exactly 4 characters in total. Which SQL pattern matching string should be used to retrieve such titles? (A) 'S%' (B) 'S_ _ _' (S followed by 3 underscores) (C) 'S****' (D) '%S'	
	Ans	(B) OR 'S_ _ _' (S followed by 3 underscores) <i>(1 Mark for the correct answer)</i>	
	(ii)	Which SQL clause is used to sort the results of a query in descending order based on "Salary" attribute? (A) SORT BY Salary DESC (B) GROUP BY Salary DESC (C) ORDER BY Salary DESC (D) ORDER BY Salary ASC	
	Ans	(C) OR ORDER BY Salary DESC <i>(1 Mark for the correct answer)</i>	

	(iii)	Statement 1 : Requirement Definition Phase is the first phase of the Web Application Development Process. Statement 2 : The scope of the application is defined during the Design Phase of the Web Application Development Process. (A) Both Statement 1 and Statement 2 are correct. (B) Both Statement 1 and Statement 2 are incorrect. (C) Statement 1 is correct but Statement 2 is incorrect. (D) Statement 1 is incorrect but Statement 2 is correct.	
	Ans	(C) OR Statement 1 is correct but Statement 2 is incorrect. <i>(1 Mark for the correct answer)</i>	
	(iv)	Which of the following launched the DISNIC program to computerize all district offices in India ? (A) Department of Human Resource (B) National Informatics Centre (C) Ministry of Foreign Affairs (D) Indian Railway Catering and Tourism Corporation	
	Ans	(B) OR National Informatics Centre <i>(1 Mark for the correct answer)</i>	
	(v)	An array of size n has elements indexed from : (A) 1 to n (B) 1 to $n-1$ (C) 0 to n (D) 0 to $n-1$	
	Ans	(D) OR 0 to $n-1$ <i>(1 Mark for the correct answer)</i>	

	(vi)	Consider the following Java Statement. String myString = "Programming"; What will myString.charAt(3) return? (A) P (B) g (C) r (D) o	
	Ans	(B) OR g <i>(1 Mark for the correct answer)</i>	
5		Answer any 5 out of the given 6 questions.	5 x 1=5
	(i)	Which aggregate function in SQL returns the total number of rows in a table ? (A) COUNT (column_name) (B) SUM () (C) TOTAL () (D) COUNT (*)	
	Ans	(D) OR COUNT (*) <i>(1 Mark for the correct answer)</i>	
	(ii)	The Entity Integrity Constraint states that : (A) A foreign key must match a primary key. (B) A primary key cannot have a NULL value. (C) All attribute values must be duplicate. (D) A domain must contain only integers.	
	Ans	(B) OR A primary key cannot have a NULL value. <i>(1 Mark for the correct answer)</i>	
	(iii)	Which of the following is not one of Java's eight primitive data types ? (A) float (B) string (C) boolean (D) char	

	Ans	(B) OR string <i>(1 Mark for the correct answer)</i>	
	(iv)	In Java, which keyword is used to handle an exception after it occurs ? (A) try (C) run (B) catch (D) finally	
	Ans	(B) OR catch <i>(1 Mark for the correct answer)</i>	
	(v)	What is the primary purpose of a constructor in a Java class? (A) To return a value from a method. (B) To stop the execution of a program. (C) To initialize the data members of a class when an object is created. (D) To declare the data type of a variable.	
	Ans	(C) OR To initialize the data members of a class when an object is created. <i>(1 Mark for the correct answer)</i>	
	(vi)	Which of the following domains uses a database specifically for storing information regarding “electoral rolls” and “different types of taxes” ? (A) Banking (B) Education (C) Government Sector (D) Hospitals	
	Ans	(C) OR Government Sector <i>(1 Mark for the correct answer)</i>	

6		Answer any 5 out of the given 6 questions.	5x1=5
	(i)	Which phase of web application development involves creating the map of the website with pages and a path connecting them? (A) Design Phase (B) Requirement Definition Phase (C) Implementation Phase (D) Testing Phase	
	Ans	(A) OR Design Phase <i>(1 Mark for the correct answer)</i>	
	(ii)	What is the final step in the “Testing Phase” before an application is considered ready for release ? (A) Compiling a list of application features. (B) Selecting a database provider. (C) Validating the modified code after fixing bugs. (D) Identifying the problem statement.	
	Ans	(C) OR Validating the modified code after fixing bugs. <i>(1 Mark for the correct answer)</i>	
	(iii)	An unexpected error situation that causes a program to terminate during runtime is called: (A) A syntax error (B) A compiler (C) An exception (D) A method	
	Ans	(C) OR An exception <i>(1 Mark for the correct answer)</i>	

	(iv)	What is the key difference between a while loop and a do-while loop ? (A) A while loop is an exit-controlled loop, while a do-while loop is an entry-controlled loop. (B) A do-while loop always executes its body at least once, whereas a while loop may never execute. (C) A while loop cannot create an infinite loop, but a do-while loop can. (D) There is no difference; they are interchangeable.	
	Ans	(B) OR A do-while loop always executes its body at least once, whereas a while loop may never execute. <i>(1 Mark for the correct answer)</i>	
	(v)	How can we convert a string variable age_string to an integer in Java ? (A) <code>int age = age_string.toInt();</code> (B) <code>int age = age_string(int);</code> (C) <code>int age = Integer(age_string);</code> (D) <code>int age = Integer.parseInt(age_string);</code>	
	Ans	(D) OR <code>int age = Integer.parseInt(age_string);</code> <i>(1 Mark for the correct answer)</i>	
	(vi)	Which prebuilt class from the <code>java.util</code> package is used to take input from the user ? (A) System (B) Scanner (C) Integer (D) Arrays	
	Ans	(B) OR Scanner <i>(1 Mark for the correct answer)</i>	

SECTION B
(Subjective Type Questions)

(30 Marks)

		<i>Answer any 3 out of the given 5 questions on Employability Skills. Answer each question in 20-30 words.</i>	3x2=6
7		What do you understand about the term “communication” ?	
	Ans	• Communication is a two-way process through which information or message is exchanged between individuals. • The message could be using language, symbols, signs or behaviour. • Speaking, listening, reading and writing are the parts of communication, which help us to understand others. <i>(2 Marks for any correct / relevant answer)</i>	
8		Explain any four parameters of an individual’s personality related to the Big Five Factor Model.	
	Ans	The parameter of an individual’s personality related to the Big Five Factor Model are: 1. Openness: Individuals with openness to experience are, generally, creative, curious, active, flexible and adventurous. 2. Consciousness: Individuals, who listen to their conscience, are self-disciplined, do their work on time, take care of others before themselves and care about others’ feelings. 3. Extraversion: Extroverts are individuals, who love interacting with people around and are, generally, talkative. 4. Agreeableness: Individuals having such a trait are, generally, kind, sympathetic, cooperative, warm and considerate. 5. Neuroticism: Neuroticism is a trait, wherein, individuals show tendency towards anxiety, self-doubt, depression, shyness and other similar negative feelings. <i>(2 Marks for any four correct parameters with explanation)</i> <i>OR</i> <i>(1 Mark if only parameter names are given)</i>	
9		What is data sorting in ICT?	

	Ans	1. Sorting Data in ICT refers to the process of arranging data elements in a specific order such as ascending or descending based on pre-defined criteria. 2. It helps in data organisation, making it easier to search, analyze and process information efficiently. (2 Marks for any correct explanation/ relevant answer) OR (2 Marks if explained with any example using spreadsheet or a SQL command)	
10		State any two environmental barriers to entrepreneurship.	
	Ans	The Environmental barriers to entrepreneurship are: - • Lack of adequate resources or raw material • Non-availability of skilled labour • Lack of requisite machinery and other infrastructure • Unavailability of monetary resources on time (1 Mark each for any two correct barriers)	
11		Define the term “green jobs” according to the UNEP.	
	Ans	According to the United Nations Environment Program (UNEP), green jobs or green collar jobs are works in agricultural, administrative, research and development, manufacturing and service activities that contribute substantially to preserving or restoring environmental quality. OR Green collar workers include professionals, such as green building architects, environmental consultants, waste management or recycling managers, environmental or biological systems engineers, landscape architects, solar and wind energy engineers and installers, green vehicle engineers, organic farmers, environmental lawyers and business personnel dealing with green services or products. (2 Marks for the correct / relevant definition) OR (2 marks for naming any two correct green jobs)	

		Answer any 3 out of the given 5 questions in 20-30 words each.	3x2=6								
12		Consider the following table Player: <table><tr><td>PCODE</td><td>POINTS</td></tr><tr><td>1</td><td>50</td></tr><tr><td>2</td><td>NULL</td></tr><tr><td>3</td><td>40</td></tr></table> Write the output of the following SQL queries:	PCODE	POINTS	1	50	2	NULL	3	40	
PCODE	POINTS										
1	50										
2	NULL										
3	40										
	(a)	SELECT AVG (POINTS) FROM Player;									
	Ans.	45.0 OR 45 OR <table><tr><td>AVG (POINTS)</td></tr><tr><td>45.0</td></tr></table> (1 mark for the correct answer)	AVG (POINTS)	45.0							
AVG (POINTS)											
45.0											
	(b)	SELECT COUNT (POINTS) FROM Player;									
	Ans	2 OR <table><tr><td>COUNT (POINTS)</td></tr><tr><td>2</td></tr></table> (1 Mark for the correct answer)	COUNT (POINTS)	2							
COUNT (POINTS)											
2											
13		Explain the use of the GROUP BY clause in SQL. Write any one SQL query that uses the GROUP BY clause.									
	Ans	In SQL, GROUP BY statement is used to group rows that have the same values into summary rows. OR The SQL GROUP BY clause groups rows with identical data into summary rows. It is primarily used with aggregate functions like COUNT () , SUM () , AVG () , MIN () , and MAX () to perform calculations on each group.									

		<u>Example:</u> <pre>SELECT Dept_No, COUNT(*) AS No_of_Teachers FROM Teacher GROUP BY Dept_No;</pre> (1 Marks for any correct definition) (1 Mark for the correct example) OR (2 Marks for correct SQL query statement with explanation)	
14		Write the output of the following Java code: <pre>public class JavaProg1 { public static void main(String[] args) { int x, y; for (x = 0, y = 5; x < 4; x++, y--) { System.out.println("x = " + x + " y = " + y); } } }</pre>	
	Ans	<pre>x = 0 y = 5 x = 1 y = 4 x = 2 y = 3 x = 3 y = 2</pre> (½ Mark for each correct line) OR (1 Mark for the correct values only)	
15		Write a Java program to print the squares of all even numbers from 1 to 20 using a do-while loop.	
	Ans	<pre>public class evenSquares { public static void main(String[] args) { int x; x = 2; do { System.out.println(x + " Squared " + x*x); x += 2; }while(x <= 20); } }</pre> (½ Mark for the variable declaration) (½ Mark for the correct do..while loop with condition) (½ Mark for printing the value) (½ Mark for incrementing the value of variable by 2 inside the loop)	

16		Discuss any two purposes of using database management applications in hospitals.							
	Ans	1. For maintaining information regarding patients such as their personal details, health records, hospitalization date. 2. For storing information regarding doctors, nurses, staff members, rooms, medical equipment, and medicines. 3. For maintaining the salary of doctors, nurses, staff members. 4. For maintaining data of pharmacy and equipments in the hospital (1 Mark each for any two correct / relevant application)							
		Answer any 2 out of the given 3 questions in 30 - 50 words each.	2x3=6						
17	(a)	Differentiate between Data Definition Language (DDL) and Data Manipulation Language (DML).							
	Ans	<table><tr><th>Data Definition Language (DDL)</th><th>Data Manipulation Language (DML)</th></tr><tr><td>DDL is a language which is used to define structure and constraints of data</td><td>DML is used to insert, modify and delete data in a database</td></tr><tr><td>Example: create table, alter table, drop table</td><td>Example: insert, delete, update</td></tr></table> (1 Mark for the correct / relevant definition of both DDL and DML) OR (1 Mark for the correct example of both DDL and DML)	Data Definition Language (DDL)	Data Manipulation Language (DML)	DDL is a language which is used to define structure and constraints of data	DML is used to insert, modify and delete data in a database	Example: create table, alter table, drop table	Example: insert, delete, update	
Data Definition Language (DDL)	Data Manipulation Language (DML)								
DDL is a language which is used to define structure and constraints of data	DML is used to insert, modify and delete data in a database								
Example: create table, alter table, drop table	Example: insert, delete, update								
	(b)	Describe the use of '%' wildcard character with the LIKE keyword.							
	Ans	The '%' wildcard character with the LIKE keyword replaces zero or more characters during string pattern matching. Example To retrieve names of all the teachers starting from letter 'S'. SELECT First_Name FROM Teacher WHERE First_Name LIKE "S%"; (1 Mark for the correct definition/ relevant explanation) OR (1 Mark for the correct example)							

	(c)	Explain the use of the HAVING clause in SQL.	1+1+1=3
	Ans	The HAVING clause is used with GROUP BY clause only. OR The HAVING clause is used to apply conditions to groups of rows (created by the GROUP BY clause). OR <pre>SELECT Dept_Name, COUNT(*) FROM Teacher GROUP BY Dept_No HAVING COUNT(*) > 1;</pre> <i>(1 Mark for the correct definition/ relevant explanation)</i> OR <i>(1 Mark for the correct example)</i>	
18	(a)	What are Wrapper classes in Java?	
	Ans	A Wrapper class is a class that converts a data type into an object of the corresponding class allowing them to be passed by reference. OR A wrapper class is a class that converts a primitive data type into an object. OR Examples: • int → Integer • char → Character • double → Double • boolean → Boolean OR Example: <pre>int num = 10; Integer obj = num;</pre> <i>(1 Mark for any correct answer)</i> OR <i>(1 Mark for any correct example)</i>	

	(b)	Rewrite the following Java program using if-else statement. <pre> public class GradeCheck { public static void main(String[] args) { char ch = 'A'; switch (ch) { case 'A': System.out.println("Grade A"); break; default: System.out.println("Grade B"); } } } </pre>	1+2=3																
	Ans	<pre> public class GradeCheck { public static void main(String[] args) { char ch = 'A'; if (ch == 'A') { System.out.println("Grade A"); } else { System.out.println("Grade B"); } } } </pre> <i>(1 Mark for the correct if statement with condition)</i> <i>(1 Mark for the correct else statement)</i>																	
19		A product-based company has created a database to keep track of various categories of manufactured products. The database contains a table named CATEGORY, whose sample data is shown below. <table border="1"> <thead> <tr> <th>Category_id</th><th>Name</th><th>Quantity</th><th>Description</th></tr> </thead> <tbody> <tr> <td>101</td><td>Electronics</td><td>500</td><td>Electronic items</td></tr> <tr> <td>102</td><td>Furniture</td><td>150</td><td>Home and office furniture</td></tr> <tr> <td>103</td><td>Clothing</td><td>300</td><td>Garments</td></tr> </tbody> </table>	Category_id	Name	Quantity	Description	101	Electronics	500	Electronic items	102	Furniture	150	Home and office furniture	103	Clothing	300	Garments	1+2=3
Category_id	Name	Quantity	Description																
101	Electronics	500	Electronic items																
102	Furniture	150	Home and office furniture																
103	Clothing	300	Garments																

	(i)	Mention the schema of the table.											
	Ans	Category(<u>Category ID</u> , Name, Quantity, Description) <i>(1 Mark for the correct schema)</i> OR <i>(½ Mark for correct table name)</i> OR <i>(½ Mark for correct column name)</i> Note: Ignore underline below the primary key attribute											
	(ii)	Write suitable data type for each column.											
	Ans	<table><tr><th>Column Name</th><th>Datatype</th></tr><tr><td>Category_ID</td><td>int OR integer OR int(3) OR integer(3)</td></tr><tr><td>Name</td><td>varchar(20) OR char(20)</td></tr><tr><td>Quantity</td><td>int OR integer OR int(6) OR integer(6)</td></tr><tr><td>Description</td><td>varchar(30) OR char(20)</td></tr></table> <i>(2 Marks for suitable data type of all the columns)</i> OR <i>(½ Mark each for any of the correct datatype)</i> Note: Ignore the size of datatype	Column Name	Datatype	Category_ID	int OR integer OR int(3) OR integer(3)	Name	varchar(20) OR char(20)	Quantity	int OR integer OR int(6) OR integer(6)	Description	varchar(30) OR char(20)	
Column Name	Datatype												
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Name	varchar(20) OR char(20)												
Quantity	int OR integer OR int(6) OR integer(6)												
Description	varchar(30) OR char(20)												
		Answer any 3 out of the given 5 questions in 50-80 words each.	3x4=12										
20		Consider the table FURNITURE containing the following columns : F_CODE : Furniture item code NAME : Furniture item name PRICE : Furniture item cost in rupees. MANUF_DATE : Manufacturing Date W_CODE : Warehouse Code	1 x 4 =4										

		Table: FURNITURE					
		F_CODE	NAME	PRICE	MANUF_DATE	W_CODE	
		10001	Dining table	20500	2017-01-12	W01	
		10012	Sofa	35000	2016-06-06	W02	
		10023	Coffee table	4000	2016-12-19	W03	
		10024	Chair	2500		W03	
		10090	Cabinet	18000	2015-03-31	W02	
		Write SQL commands for the following:					
	(a)	Display F_CODE , NAME , and PRICE of items that have a price less than ₹5000.					
	Ans	SELECT F_CODE, NAME, PRICE FROM FURNITURE WHERE PRICE<5000; <i>(1 Mark for correct query statement)</i> OR <i>(½ Mark for writing SELECT statement)</i> OR <i>(½ Mark for correct WHERE clause)</i>					
	(b)	Display NAME and PRICE of those furniture items whose MANUF_DATE is not known.					
	Ans	SELECT NAME, PRICE FROM FURNITURE WHERE MANUF_DATE IS NULL; <i>(1 Mark for correct query statement)</i> OR <i>(½ Mark for writing SELECT statement)</i> OR <i>(½ Mark for correct WHERE clause)</i>					
	(c)	Display the warehouse codes of furniture items without repetition.					
	Ans	SELECT DISTINCT W_CODE FROM FURNITURE; <i>(1 Mark for correct query statement)</i>					

	(d)	Change the price of furniture with name 'Sofa' to 25000.	
	Ans	UPDATE FURNITURE SET PRICE = 25000 WHERE NAME = "SOFA"; (1 Mark for correct query statement) OR (½ Mark for the correct UPDATE... SET) OR (½ Mark for the correct WHERE clause)	
21	(a)	What is Project Management?	1+2+1=4
	Ans	Project Management is the process of achieving the objectives of the project through a set of activities defined within the time frame, to produce the end result. OR Project management is the process of planning, organizing, executing, monitoring, and completing a project successfully within the given time, cost, and resource constraints. (1 Mark for the correct definition/ any relevant answer)	
	(b)	Mention any two characteristics of a project.	
	Ans	Some of the key characteristics of a project are as follows: ● A project has a beginning and an end. The extent of the project is defined. It has boundaries. ● A project requires finite resources that are required to complete the project. ● A project has a specific time frame. It has definite beginning and end dates. ● A project is complete when its end objectives are achieved. The objective is specific and identifiable. (2 Marks for any two correct characteristics)	

	(c)	Explain the Planning and Monitoring phase of the web application development process.	
	Ans	• The Planning and Monitoring phase is carried out alongside all stages of Web Development. • A project plan lists the activities that are required to be monitored during project execution. • For each activity information useful for its monitoring is defined, like, duration, costs, schedule, resources required, and risk involved. <i>(1 Mark for any correct definition/ any relevant answer)</i>	
22	(a)	Refer to the following Java code snippet. The code contains certain errors. Rewrite the correct code, underlining all the corrections made. <pre> boolean isprime = true num = 5; if num <= 1 { isprime = false; } else { for (int i = 2; i <= num / 2; i++ { if (num % i == 0) { isprime = false; break; } } } </pre>	2+2=4
	Ans	<u>Corrected code:</u> <pre> boolean isprime = <u>true</u>; <u>int</u> num = 5; if (<u>num <= 1</u>) { isprime = false; } else { for (int i = 2; i <= num / 2; <u>i++</u>) { if (num % i == 0) { isprime = false; break; } } } </pre> <i>(2 Marks for all four corrections)</i> OR <i>(½ Mark for each correction)</i>	

	(b)	Write the output of the following Java Program. <pre>public class JavaProg { public static void main(String[] args) { String first_name = "Ayushman"; String last_name = "Bharat"; System.out.println(first_name + " " + last_name.toUpperCase() + first_name.indexOf('a')); } }</pre>	
	Ans	Ayushman BHARAT6 (2 Marks for the correct line of output) OR (1 Mark for writing Ayushman only) OR (1 Mark for writing BHARAT6 only)	
23		Explain how threads can be created by extending the Thread class, and give an example.	4
	Ans	In Java, threads can be created in two ways: 1. By extending the Thread class 2. By implementing the Runnable interface The first method to create a thread is to create a class that extends the Thread class from the java.lang package and override the run() method. The run() method is the entry point for every new thread that is instantiated from the class. <pre>public class ExtendThread extends Thread { public void run() { System.out.println("Created a Thread"); for (int count = 1; count <= 3; count++) System.out.println("Count=" + count); } }</pre> To create a thread, instantiate it from the ExtendThread class, and to start its execution, call the start() method of the Thread class. <pre>public static void main(String args[]) { ExtendThread t1 = new ExtendThread(); t1.start(); }</pre> (2 Marks for the correct definition/ explanation) (2 Marks for the correct example)	

24		Given the array double[] scores = {85.5, 92.0, 76.5, 88.0, 65.0} , assume that the java.util.Arrays class is already imported. Write Java statements to perform each of the following operations :	1 X 4=4
	(a)	Sort the scores array in ascending order.	
	Ans	<code>Arrays.sort(scores);</code> <i>(1 Mark for the correct statement)</i>	
	(b)	Print the first element of the array after it has been sorted.	
	Ans	<code>System.out.println("First element:" + scores[0]);</code> <i>(1 Mark for the correct statement)</i>	
	(c)	Use the array's property to determine the total number of elements in scores .	
	Ans	<code>scores.length</code> OR <code>System.out.println("Length:" + scores.length)</code> <i>(1 Mark for any correct statement)</i>	
	(d)	Search for the index of the score 92.0 using a built-in method (assume the array is sorted).	
	Ans	<code>int index=Arrays.binarySearch(scores, 92.0);</code> <i>(1 Mark for the correct statement)</i>	