

Strictly Confidential: (For Internal and Restricted use only)
Senior School Certificate Examination - September 2021
Marking Scheme - Informatics Practices (NEW) (SUBJECT CODE: 065)
(SET-4 | SERIES: 3HKP3b /C PAPER CODE - 90)

General Instructions:

1. 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 the teaching profession. To avoid mistakes, it is requested that before starting evaluation, you must read and understand the spot evaluation guidelines carefully. **Evaluation is a 10 -12 days mission for all of us. Hence, it is necessary that you put in your best efforts in this process.**
2. 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 the latest information or knowledge and/or are innovative, they may be assessed for their correctness otherwise and marks will be awarded to them.**
3. 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. 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.
4. 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.
5. If a question does not have any parts, marks must be awarded in the left hand margin and encircled.
6. If a student has attempted an extra question, the answer of the question deserving more marks should be retained and the other answer scored out.
7. No marks to be deducted for the cumulative effect of an error. It should be penalized only once.
8. A full scale of marks 70 (example: 1-70) has to be used. Please do not hesitate to award full marks if the answer deserves it.
9. Every examiner has to necessarily do evaluation work for full working hours i.e. 8 hours every day and evaluate 25 answer books per day.
10. Ensure that you do not make the following common types of errors committed by some Examiners in the past:-
 - a. Leaving the answer or part thereof unassessed in an answer book.
 - b. Giving more marks for an answer than assigned to it.
 - c. Wrong transfer of marks from the inside pages of the answer book to the title page.
 - d. Wrong question wise totaling on the title page.
 - e. Wrong totaling of marks of the two columns on the title page.
 - f. Wrong grand total.
 - g. Marks in words and figures not tallying.
 - h. Wrong transfer of marks from the answer book to online award list.
 - i. 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 answers.)
 - j. Half or a part of the answer marked correct and the rest as wrong, but no marks awarded.
11. While evaluating the answer books, if the answer is found to be totally incorrect, it should be marked as (X) and awarded zero (0) Marks.
12. 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.
13. The Examiners should acquaint themselves with the guidelines given in the Guidelines for spot Evaluation before starting the actual evaluation.
14. 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.

15. The Board permits candidates to obtain a photocopy of the Answer Book on request in an RTI application and also separately as a part of the re-evaluation process on payment of the processing charges.

Specific Instructions:

- (i) This question paper contains two parts - Part A and Part B. Each part is **compulsory**.
 - (ii) Both Part A and Part B have choices.
 - (iii) Part A has **two** sections :
 - (a) Section I is short answer questions, to be answered in one word or one line.
 - (b) Section II has **two** case study questions. Each case study has 5 case-based subparts. An examinee is to attempt any 4 out of the 5 subparts.
 - (iv) Part B is Descriptive Paper.
 - (v) Part B has **three** sections :
 - (a) Section I is short answer questions of 2 marks each in which **two** questions have internal options.
 - (b) Section II is long answer questions of 3 marks each in which **two** questions have internal options.
 - (c) Section III is very long answer questions of 5 marks each in which **one** question has internal option.
- All programming questions have to be answered with respect to Python only
 - In Python, ignore case sensitivity for identifiers (Variable / Functions / Structures / Class Names)
 - In Python indentation is mandatory, however, the number of spaces used for indenting may vary
 - In SQL related questions - both ways of text/character entries should be acceptable for Example: "AMAR" and 'amar' both are acceptable.
 - In SQL related questions - all date entries should be acceptable for Example: 'YYYY-MM-DD', 'YY-MM-DD', 'DD-Mon-YY', "DD/MM/YY", 'DD/MM/YY', "MM/DD/YY", 'MM/DD/YY' and {MM/DD/YY} are correct.
 - In SQL related questions - semicolon should be ignored for terminating the SQL statements
 - In SQL related questions, ignore case sensitivity.

Part-A

Attempt any 15 questions from questions 1 to 21.

1	<p>You were not able to create the IP project, therefore you downloaded a project from the internet and submitted it to your teacher by your name. This wrong/unethical act is considered as _____ .</p> <p>(A) Copyright (B) Hacking (C) Plagiarism (D) Trademark</p>	1
Ans	(C) Plagiarism	
	(1 Mark for writing correct option)	
2	<p>Which Python package is used for 2D graphics ?</p> <p>(A) matplotlib.pyplot (B) pyplot.lib (C) matplotlib.py (D) matplotlib.plt</p>	1
Ans	(A) matplotlib.pyplot	
	(1 Mark for writing correct option)	
3	<p>Write the output of the following SQL command :</p> <p>select round(3456.885, 2) ;</p>	1

		(A) 3456.88 (B) 3456.89 (C) 3400 (D) 3500	
Ans		(D) 3500	
		(1 Mark for writing correct option)	
4		<p>What will be the output of the following program ?</p> <pre>import pandas as pd x=6 S1=pd.Series(x,index=[1,2,4,6,8,9]) print(S1)</pre> <p>(A) 1 6 2 6 4 6 6 6 8 6 9 6 dtype: int64</p> <p>(B) 0 6 dtype: int64</p> <p>(C) 1 2 4 6 8 9 6 6 6 6 6 6 dtype: int64</p> <p>(D) None of the above</p>	1
Ans		(A) 1 6 2 6 4 6 6 6 8 6 9 6 dtype: int64	
		(1 Mark for writing correct option)	
5		<p>Which one of the following is an attribute of the series in Pandas to set the index label for the given object ?</p> <p>(A) label (B) index (C) loc (D) All of the above</p>	1
Ans		(B) index	
		(1 Mark for writing correct option)	
6		<p>Using Python Matplotlib _____ can be used to display information as a series of data points.</p> <p>(A) line chart (B) bar graph (C) histogram (D) None of the above</p>	1
Ans		(A) line chart	
		(1 Mark for writing correct option)	
7		<p>Which of the following topologies needs least cable length ?</p> <p>(A) Star (B) Tree</p>	1

		(C) Bus (D) None of the above	
Ans		(C) Bus	
		(1 Mark for writing correct option)	
8		Out of the following, which crime(s) will come under cyber crime category ? (A) Identity theft (B) Invasion of privacy (C) Online harassment (D) All of the above	1
Ans		(D) All of the above	
		(1 Mark for writing correct option)	
9		An aggregate function performs a calculation on _____ and returns a single value. (A) single value (B) multiple values (C) no value (D) None of the above	1
Ans		(B) multiple values	
		(1 Mark for writing correct option)	
10		Which of the following is a web browser ? (A) Microsoft Windows (B) Android (C) Microsoft Edge (D) Ubuntu	1
Ans		(C) Microsoft Edge	
		(1 Mark for writing correct option)	
11		Which one of the following would arrange the rows in ascending order in SQL ? (A) SORT BY (B) ALIGN BY (C) GROUP BY (D) ORDER BY	1
Ans		(D) ORDER BY	
		(1 Mark for writing correct option)	
12		Technology not protected by copyright and available to everyone, is categorized as: (A) Proprietary (B) Open Source (C) Experimental (D) Shareware	1
Ans		(B) Open Source	
		(1 Mark for writing correct option)	
13		What will be the output of the Python program ? <code>import pandas as pd</code> <code>I=['Apple', 'Banana', 'Mango', 'Orange', 'Litchi']</code> <code>df=pd.DataFrame(I,index=[1,2,3,4,5])</code> <code>print(df.iloc[1:3])</code>	1
Ans		0 2 Banana 3 Mango	
		(1 Mark for writing correct output)	
14		Indian law to deal with cyber crime is :	1

		(A) Cyber Act (CA) (B) Internet Act (IA) (C) IT Act (ITA) (D) WWW Act (WWWA)	
Ans		(C) IT Act (ITA)	
		(1 Mark for writing correct option)	
15		A _____ is a collection of interconnected _____ designed with a goal in mind. (A) webpage, website (B) web browser, webpage (C) server, client (D) website, webpage	1
Ans		(D) website, webpage	
		(1 Mark for writing correct option)	
16		In the _____ field of the e-mail, enter the recipients whose address you want to hide from other recipients. (A) Carbon Copy (B) To (C) Blind Carbon Copy (D) All of the above	1
Ans		(C) Blind Carbon Copy	
		(1 Mark for writing correct option)	
17		E-waste is harmful to the environment and human health if not properly treated or disposed of, therefore they must be handled with care. What are the health hazards which can be caused by E-waste ? (A) Lung cancer (B) DNA damage (C) Brain damage (D) All of the above	1
Ans		(D) All of the above	
		(1 Mark for writing correct option)	
18		The _____ command can be used to select an existing database in SQL.	1
Ans		USE	
		(1 Mark for writing correct command)	
19		The SQL string function that returns the index of the first occurrence of substring is _____ .	1
Ans		INSTR	
		(1 Mark for writing correct command)	
20		What is the type of network for long distance communication ? (A) LAN (B) MAN (C) WAN (D) PAN	1
Ans		(C) WAN	
		(1 Mark for writing correct option)	
21		_____ helps to enhance the functionality of the web browsers. (A) Extension (B) Plugin	1

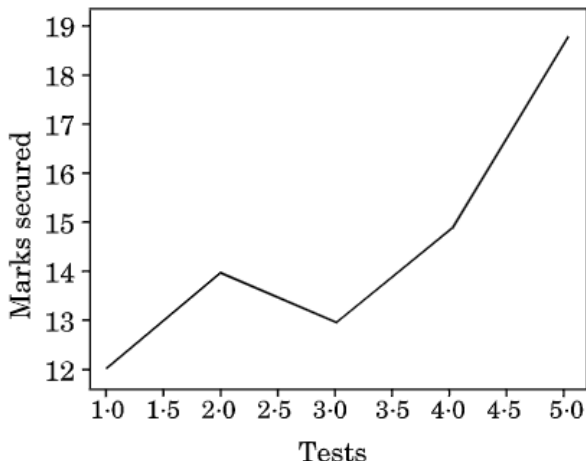
		(C) Add-on (D) All of the above	
Ans		(D) All of the above	
		(1 Mark for writing correct option)	
		<p style="text-align: center;">SECTION II</p> <p>Both the case study-based questions (Q. Nos. 22 and 23) are compulsory. Attempt any four subparts from each question. Each sub questions carries 1 mark.</p>	
22		<p>Consider the following DataFarme df and answer any four questions from (i) to (v) :</p> <pre>import pandas as pd t={'rollno': [1,2,3,4,5,6], 'Name': ['Krishna', 'Pranshu', 'Gurusha', 'Arpit', 'Rani', 'Aurobindo'], 'Age': [15,14,14,15,16,15], 'marks': [70.4,60.9,80.3,87.5,67.8,86.0], 'class': ['11A', '12B', '11B', '12B', '12B', '11B']} df = pd.DataFrame(t,index=[10,20,30,40,50,60])</pre>	
	(i)	<p>Write down the command that will give the following output :</p> <pre>rollno 2 Name Pranshu Age 14 Marks 60.9 Class 12B Name: 20, dtype: object</pre> <p>(A) <code>print(df.iloc[1])</code> (B) <code>print(df.loc[1])</code> (C) <code>print(df.LOC[1])</code> (D) <code>print(df.iloc(1))</code></p>	1
Ans		(A) <code>print(df.iloc[1])</code>	
		(1 Mark for writing correct option)	
	(ii)	<p>The teacher wants to know the highest marks secured by the students. Which statement would help her to get the correct answer ?</p> <p>(A) <code>print(df[marks].max())</code> (B) <code>print(df.max([marks]))</code> (C) <code>print(df['marks'].max())</code> (D) <code>print(df('marks').max)</code></p>	1
Ans		(C) <code>print(df['marks'].max())</code>	
		(1 Mark for writing correct option)	
	(iii)	<p>Which of the following statement(s) will add new column 'fee' as third column with values [3200,3400,4500,3100,3200,4000] in DataFrame df ?</p> <p>(A) <code>df.insert(loc=2,column='fee',value=[3200,3400,4500,3100,3200,4000])</code> (B) <code>df.add(2,column='fee',[3200,3400,4500,3100,3200,4000])</code> (C) <code>df.append(loc=2,'fee'=[3200,3400,4500,3100,3200,4000])</code> (D) <code>df.insert(loc=2,'fee'=[3200,3400,4500,3100,3200,4000])</code></p>	1
Ans		(A) <code>df.insert(loc=2,column='fee',value=[3200,3400,4500,3100,3200,4000])</code>	
		(1 Mark for writing correct option)	
	(iv)	<p>Which of the following commands is used to remove the column 'Age' in the DataFrame df?</p> <p>(A) <code>df.drop('Age',axis=1,inplace=True)</code> (B) <code>df.drop('Age',axis=0,inplace=True)</code></p>	1

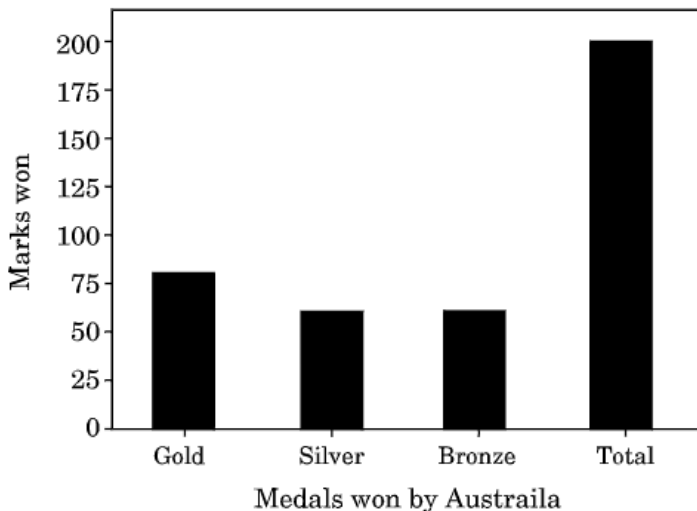
		(C) df.drop(['Age',axis=1,inplace=True] (D) df.delete('Age',axis=1,inplace=True)																																					
Ans		(A) df.drop('Age',axis=1,inplace=True)																																					
		(1 Mark for writing correct option)																																					
	(v)	Which of the following command would rename the DataFrame df ? (A) df.rename(['marks','Term1'],inplace=True) (B) df.rename({'marks':'Term1'},inplace=True) (C) df.rename(columns={'marks':'Term1'},inplace=True) (D) df.rename(['marks':'Term1'],inplace=True)	1																																				
Ans		(C) df.rename(columns={'marks':'Term1'},inplace=True)																																					
		(1 Mark for writing correct option)																																					
23		Consider the table HOTEL given below and write any four SQL commands : Table : HOTEL																																					
		<table><tr><th>Hotel_Id</th><th>H_Name</th><th>Location</th><th>Room_type</th><th>Price</th><th>Star</th></tr><tr><td>H001</td><td>The Palace</td><td>Delhi</td><td>Deluxe</td><td>4500</td><td>5</td></tr><tr><td>H002</td><td>The Resort</td><td>Mumbai</td><td>Deluxe</td><td>8000</td><td>7</td></tr><tr><td>H003</td><td>Adobe Resort</td><td>Dubai</td><td>Villa</td><td>2750</td><td>7</td></tr><tr><td>H004</td><td>Victoria Hill</td><td>London</td><td>Duplex</td><td>10000</td><td>3</td></tr><tr><td>H005</td><td>The Bee</td><td>London</td><td>Villa</td><td>30000</td><td>7</td></tr></table>	Hotel_Id	H_Name	Location	Room_type	Price	Star	H001	The Palace	Delhi	Deluxe	4500	5	H002	The Resort	Mumbai	Deluxe	8000	7	H003	Adobe Resort	Dubai	Villa	2750	7	H004	Victoria Hill	London	Duplex	10000	3	H005	The Bee	London	Villa	30000	7	
Hotel_Id	H_Name	Location	Room_type	Price	Star																																		
H001	The Palace	Delhi	Deluxe	4500	5																																		
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H003	Adobe Resort	Dubai	Villa	2750	7																																		
H004	Victoria Hill	London	Duplex	10000	3																																		
H005	The Bee	London	Villa	30000	7																																		
	(i)	Display the details of all the Hotels situated in London.	1																																				
Ans		SELECT * FROM HOTEL WHERE Location = 'London';																																					
		(½ Mark for writing correct SELECT portion) (½ Mark for writing correct WHERE portion)																																					
	(ii)	Display the details of all 'Deluxe' rooms with price more than 6000 in ascending order of Price.	1																																				
Ans		SELECT * FROM HOTEL WHERE Room_type = 'Deluxe' AND Price > 6000 ORDER BY Price; OR SELECT * FROM HOTEL WHERE Room_type = 'Deluxe' && Price > 6000 ORDER BY Price;																																					
		(½ Mark for writing correct SELECT portion) (½ Mark for writing correct WHERE portion) OR (½ Mark for writing correct ORDER BY portion)																																					
	(iii)	Display the Hotel names that end with "e".	1																																				
Ans		SELECT H_Name FROM HOTEL WHERE H_Name LIKE '%e'; OR SELECT * FROM HOTEL WHERE H_Name LIKE '%e';																																					
		(½ Mark for writing correct SELECT portion) (½ Mark for writing correct WHERE portion)																																					
	(iv)	Count different types of rooms available in the Hotels.	1																																				
Ans		SELECT COUNT(DISTINCT Room_type) FROM HOTEL ;																																					
		(½ Mark for writing correct COUNT with SELECT) (½ Mark for writing correct DISTINCT and FROM)																																					
	(v)	Display the Hotel names in descending order.	1																																				
Ans		SELECT H Name FROM HOTEL ORDER BY H Name DESC ;																																					

		OR <code>SELECT * FROM HOTEL ORDER BY H_Name DESC ;</code>	
		<i>(½ Mark for writing correct SELECT portion)</i> <i>(½ Mark for writing correct ORDER BY with DESC)</i>	
		PART B SECTION I	
24		Write a program in Python to create the series of all the alphabets of "Happy" with default index. Print the first three alphabets.	2
Ans		<code>import pandas as pd</code> <code>S=pd.Series(list('Happy'))</code> <code>print(S.head(3))</code>	
		<i>(1 Mark for creating correct the series correctly)</i> <i>(½ Mark for writing correct import statement)</i> <i>(½ Mark for writing correct statement to display the first three alphabets)</i>	
25	(a)	Raunak wanted to display the list of employees who did not get commission. Therefore, he wrote the following query in SQL : <code>SELECT emp_name from emp where comm=NULL;</code> He did not get the correct answer. Identify the error and write the correct SQL statement.	2
	Ans	<code>SELECT emp_name FROM emp WHERE comm IS NULL;</code>	
		<i>(2 Marks for identifying and writing the correct statement)</i>	
		OR	
	(b)	Can we use Where clause after Group By clause ? Name the clause which is used to restrict the number of records returned by the Group By clause.	2
	Ans	No HAVING	
		<i>(1 Mark for writing correct answer for the first part as No)</i> <i>(1 Mark for writing correct HAVING Clause)</i>	
26		Discuss the purpose of count(*) function with the help of a suitable example.	2
Ans		<code>COUNT(*)</code> is used to return cardinality of selected rows from a table. Example <code>SELECT COUNT(*) FROM HOTEL ;</code>	
		<i>(1 Mark for writing correct purpose of count(*))</i> <i>(1 Mark for writing correct example illustrating count(*))</i>	
27		Consider the following two series 'A' and 'B' : <code>A=pd.Series([2,4,6], index=[0,1,2])</code> <code>B=pd.Series([1,3,5], index=[1,2,3])</code>	2
	(i)	Write the statement to add both the series 'A' and 'B'	
	Ans	<code>A + B</code> OR <code>A.add(B)</code> OR <code>B.add(A)</code>	
		<i>(1 Mark for writing correct statement to add A and B)</i>	
	(ii)	Write the statement to multiply two series 'A' and 'B'	
	Ans	<code>A * B</code> OR <code>A.mul(B)</code> OR <code>B.mul(A)</code>	
		<i>(1 Mark for writing correct statement to multiply A and B)</i>	

28	Write the output (i and ii) for the following SQL commands : Table: F_INDIA	2																																										
	<table><tr><th>F_ID</th><th>Product</th><th>Price</th><th>Qty</th></tr><tr><td>F01</td><td>Sun Cream</td><td>678</td><td>10</td></tr><tr><td>F02</td><td>Beauty Cream</td><td>5400</td><td>15</td></tr><tr><td>F03</td><td>Face Glow Foundation</td><td>1704</td><td>20</td></tr><tr><td>F04</td><td>Gel Wax</td><td>520</td><td>10</td></tr><tr><td>F05</td><td>Hair Shampoo</td><td>800</td><td>25</td></tr><tr><td>F06</td><td>Beauty Cream</td><td>1200</td><td>32</td></tr></table>	F_ID	Product	Price	Qty	F01	Sun Cream	678	10	F02	Beauty Cream	5400	15	F03	Face Glow Foundation	1704	20	F04	Gel Wax	520	10	F05	Hair Shampoo	800	25	F06	Beauty Cream	1200	32															
F_ID	Product	Price	Qty																																									
F01	Sun Cream	678	10																																									
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F05	Hair Shampoo	800	25																																									
F06	Beauty Cream	1200	32																																									
	(i) SELECT COUNT (Distinct product) FROM F_INDIA;																																											
Ans	<u>COUNT (Distinct product)</u> 5																																											
	(1 Mark for writing correct output)																																											
	(ii) SELECT Product, Price FROM F_INDIA WHERE Product LIKE '%m';																																											
Ans	<u>Product</u> <u>Price</u> Sun Cream 678 Beauty Cream 5400																																											
	(1 Mark for writing correct output)																																											
29	(a) Find the output of the following SQL queries :	2																																										
	(i) SELECT SUBSTR("Innovation",3,4) ;																																											
Ans	nova																																											
	(1 Mark for writing correct output)																																											
	(ii) SELECT RIGHT("Innovation",5) ;																																											
Ans	ation																																											
	(1 Mark for writing correct output)																																											
	OR																																											
	(b) Find the output of the following SQL queries :	2																																										
	(i) SELECT INSTR("COVID-19","V") ;																																											
Ans	3																																											
	(1 Mark for writing correct output)																																											
	(ii) SELECT MOD(5,2) ;																																											
Ans	1																																											
	(1 Mark for writing correct output)																																											
30	Consider the following dataFrame 'stu' : <table><tr><th></th><th>Admno</th><th>Firstname</th><th>Lastname</th><th>Age</th><th>Pretest</th><th>Posttest</th></tr><tr><td>0</td><td>1001</td><td>Amit</td><td>Sehgal</td><td>18</td><td>87</td><td>67</td></tr><tr><td>1</td><td>1002</td><td>Rohit</td><td>Malik</td><td>17</td><td>89</td><td>78</td></tr><tr><td>2</td><td>1003</td><td>Shyam</td><td>Bhatia</td><td>18</td><td>90</td><td>84</td></tr><tr><td>3</td><td>1004</td><td>Manan</td><td>Gupta</td><td>16</td><td>79</td><td>69</td></tr><tr><td>4</td><td>1005</td><td>Raman</td><td>Bajaj</td><td>18</td><td>92</td><td>70</td></tr></table>		Admno	Firstname	Lastname	Age	Pretest	Posttest	0	1001	Amit	Sehgal	18	87	67	1	1002	Rohit	Malik	17	89	78	2	1003	Shyam	Bhatia	18	90	84	3	1004	Manan	Gupta	16	79	69	4	1005	Raman	Bajaj	18	92	70	
	Admno	Firstname	Lastname	Age	Pretest	Posttest																																						
0	1001	Amit	Sehgal	18	87	67																																						
1	1002	Rohit	Malik	17	89	78																																						
2	1003	Shyam	Bhatia	18	90	84																																						
3	1004	Manan	Gupta	16	79	69																																						
4	1005	Raman	Bajaj	18	92	70																																						

		Write the statements for the DataFrame “stu” :	2
	(i)	Display the details of the students in the reverse order of their indexes.	
	Ans	<code>print(stu[::-1])</code> <i>(1 Mark for writing correct statement)</i>	
	(ii)	Add a new row in the DataFrame “stu” with values (1006, Sujal, Sharma, 17, 87, 89)	
	Ans	<code>stu=stu.append({'Admno':1006,'Firstname':'Sujal','Lastname':'Sharma', 'Age':17,'Pretest': 87,'Posttest': 89}, ignore_index=True)</code> OR <code>stu.loc[5]=[1006, Sujal, Sharma, 17, 87, 89]</code> OR <code>stu.loc[len(stu.index)]=[1006, Sujal, Sharma, 17, 87, 89]</code> OR <code>stu.at[5]=[1006, Sujal, Sharma, 17, 87, 89]</code> <i>(1 Mark for writing correct statement)</i>	
31		What do you understand by the term VoIP ? Give two examples of software/apps based on VoIP.	2
	Ans	VoIP stands for Voice over Internet Protocol. It is an Internet service which makes audio and video calls possible from any Internet connected device.	
		<i>(1 Mark for writing correct expansion of VoIP)</i> <i>(1 Mark for writing correct usage of VoIP)</i>	
32		Nowadays children are fond of playing computer games. What is the health hazard that can occur due to excessive use of computer/smart phone screens ?	2
	Ans	Constant exposure to computer/smartphone screens impact vision and may lead to eye-related problems. Continuous engagement with a computer/smartphone can also cause back, neck and shoulder pains and headache.	
		<i>(2 Mark for writing correct Health Hazard)</i>	
33		Expand URL. Explain URL with the help of an example.	2
	Ans	Uniform Resource Locator Each website has a unique address called URL. For example: https://cbse.nic.in	
		<i>(1 Mark for writing correct expansion of URL)</i> <i>(½ Mark for writing correct explanation of URL)</i> <i>(½ Mark for writing correct example of a URL)</i>	
SECTION II			
34		Create a series S1 with the values (2,3,1).	3
	Ans	<code>import pandas as pd</code> <code>S1=pd.Series([2,3,1])</code> <i>(½ Mark for writing correct import statement)</i> <i>(½ Mark for writing correct statement to create the S1 series)</i>	
		Find the output of the following two statements considering the above created series :	
	(a)	<code>print(S1**3)</code>	
	Ans	0 8 1 27 2 1	

		<code>dtype: int64</code>	
		<i>(1 Mark for writing correct output)</i>	
	(b)	<code>print(S1*3)</code>	
	Ans	<pre>0 6 1 9 2 3 dtype: int64</pre>	
		<i>(1 Mark for writing correct output)</i>	
35	(a)	What is the difference between Copyright and Licenses ?	3
	Ans	<p>Copyright is a legal instrument which reserves the right of the creator of an original creative work.</p> <p>Licence is a legal instrument which reserves the right to use/reuse/distribute a product/creation of a copyright holder.</p>	
		<i>(3 Marks for writing correct difference)</i> OR <i>(1½ Marks for writing correct explanation of Copyright)</i> <i>(1½ Marks for writing correct explanation of Licence)</i>	
		OR	
	(b)	What do you understand by Intellectual Property Rights ? Why is there a need to protect Intellectual Property Rights ?	3
	Ans	<p>IPR (Intellectual Property Rights) are the rights of the owner of information to decide how much of the information is to be exchanged, shared or distributed.</p> <p>Intellectual Property Rights are needed because :</p> <ul style="list-style-type: none">• It encourages individuals and businesses to create new software as well as improving existing applications.• Ensures new ideas and technologies are widely distributed.• Promotes investment in the national economy <p>(Any two needs)</p>	
		<i>(1 Mark for writing correct explanation of Intellectual Property Rights)</i> <i>(1 Mark for writing each correct need of Intellectual Property Rights)</i>	
36	(a)	Consider the following graph. Write the code to plot it. Also label the X and Y axis.	3
			
	Ans	<pre>import matplotlib.pyplot as plt x=[1,2,3,4,5]</pre>	

	<pre>Y=[12,14,13,15,19] plt.plot(X,Y) plt.xlabel('Tests') plt.ylabel('Marks secured') plt.show()</pre>											
	<p>(½ Mark for writing correct import statement) (½ Mark for writing correct assignments for X and Y) (½ Mark for writing correct plot statement) (½ Mark for writing correct statement to label X axis) (½ Mark for writing correct statement to label Y axis) (½ Mark for writing correct statement to show the graph)</p>											
	OR											
(b)	Write code to draw the following bar graph representing the total number of medals won by Australia.	3										
	<p style="text-align: center;">AUSTRALIA MEDAL PLOT</p>  <table><caption>Data for AUSTRALIA MEDAL PLOT</caption><thead><tr><th>Medal Type</th><th>Marks won</th></tr></thead><tbody><tr><td>Gold</td><td>75</td></tr><tr><td>Silver</td><td>50</td></tr><tr><td>Bronze</td><td>50</td></tr><tr><td>Total</td><td>200</td></tr></tbody></table>	Medal Type	Marks won	Gold	75	Silver	50	Bronze	50	Total	200	
Medal Type	Marks won											
Gold	75											
Silver	50											
Bronze	50											
Total	200											
Ans	<pre>import matplotlib.pyplot as plt X=['Gold', 'Silver', 'Bronze', 'Total'] Y=[75,50,50,200] plt.bar(X,Y) plt.xlabel('Medals won by Australia') plt.ylabel('Medals won') plt.title('AUSTRALIA MEDAL PLOT') plt.show()</pre>											
	<p>(½ Mark for writing correct import statement) (½ Mark for writing correct assignments for X and Y) (½ Mark for writing correct bar statement) (½ Mark for writing correct statement to label X and Y axis) (½ Mark for writing correct statement to display the Title) (½ Mark for writing correct statement to show the graph)</p>											
	Questions for visually impaired students only :											
(a)	What is Data Visualization ? Discuss briefly. Also mention the name of one of the most commonly used Python library for data visualization.	3										
Ans	Data visualization is the graphical representation of information and data. Data visualization is another form of visual art that grabs our interest and keeps our eyes on the message.											

	Most commonly used Python Library for data visualization is matplotlib																																											
	(2 Marks for writing correct explanation of Data Visualization) (1 Mark for writing correct name of commonly used Python library for Data Visualization)																																											
	OR																																											
(b)	Mention the purpose of the following functions briefly :	3																																										
(i)	plot()																																											
Ans	The plot() function draws a line from point to point. The function takes the following parameters for specifying points in the diagram : first parameter is an array containing the points on the x-axis the second parameter is an array containing the points on the y-axis																																											
	(1 Mark for writing correct explanation of plot())																																											
(ii)	show()																																											
Ans	The show() function in the pyplot module of matplotlib library is used to display all figures.																																											
	(1 Mark for writing correct explanation of show())																																											
(iii)	savefig()																																											
Ans	The savefig() method is used to save the figure created after plotting data. The figure created can be saved to our local machines by using this method.																																											
	(1 Mark for writing correct explanation of savefig())																																											
37	Consider the following table School :																																											
	Table : School	3																																										
	<table><tr><th>Admno</th><th>Name</th><th>Class</th><th>House</th><th>Percentage</th><th>Gender</th></tr><tr><td>20150001</td><td>Abhishek Kumar</td><td>10</td><td>Green</td><td>86</td><td>Male</td></tr><tr><td>20140212</td><td>Mohit Bhardwaj</td><td>11</td><td>Red</td><td>75</td><td>Male</td></tr><tr><td>20090234</td><td>Ramandeep Kaur</td><td>10</td><td>Yellow</td><td>84</td><td>Female</td></tr><tr><td>20130216</td><td>Mukesh Sharma</td><td>9</td><td>Red</td><td>91</td><td>Male</td></tr><tr><td>20190227</td><td>Rahil Arora</td><td>10</td><td>Blue</td><td>70</td><td>Male</td></tr><tr><td>20120200</td><td>Swapnil Bhatt</td><td>11</td><td>Red</td><td>64</td><td>Female</td></tr></table>	Admno	Name	Class	House	Percentage	Gender	20150001	Abhishek Kumar	10	Green	86	Male	20140212	Mohit Bhardwaj	11	Red	75	Male	20090234	Ramandeep Kaur	10	Yellow	84	Female	20130216	Mukesh Sharma	9	Red	91	Male	20190227	Rahil Arora	10	Blue	70	Male	20120200	Swapnil Bhatt	11	Red	64	Female	
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	Write SQL queries for the following :																																											
(a)	Display the total number of students in each House where number of students are more than 2.																																											
Ans	SELECT COUNT(*), House FROM School GROUP BY House HAVING COUNT(*)>2 ; (½ Mark for writing correct SELECT portion) (½ Mark for writing correct GROUP BY and HAVING portion)																																											
(b)	Display the average Percentage of girls and boys.																																											
Ans	SELECT AVG(Percentage), Gender FROM School GROUP BY Gender ; (½ Mark for writing correct SELECT portion) (½ Mark for writing correct GROUP BY portion)																																											
(c)	Display the minimum Percentage secured by the students of Class 10.																																											
Ans	SELECT MIN(Percentage) FROM School WHERE Class=10 ; (½ Mark for writing correct SELECT portion)																																											

(½ Mark for writing correct WHERE portion)

SECTION III

- 38 (a) Write a program in Python Pandas to create the following DataFrame “population” from a Dictionary :

	country	population	percent
IT	Italy	61	0.83
ES	Spain	46	0.63
GR	Greece	11	0.15
FR	France	65	0.88
PO	Portugal	10	0.14

5

Ans

```
import pandas as pd
IDX=['IT','ES','GR','FR','PO']
D={
    'country':['Italy','Spain','Greece','France','Portugal'],
    'population':[61,46,11,65,10],
    'percent':[0.83,0.63,0.15,0.88,0.14]
}
DF=pd.DataFrame(D,index=IDX)
```

(½ Mark for writing correct import statement)
(1 Mark for writing correct statement to create the DataFrame with correct Columns and corresponding Values)
(½ Mark for writing correct statement to assign the required index)

- (b) Perform the following operations on the DataFrame:

- (i) Display the columns country and population.

Ans

```
print(DF[['country','population']])
```

(1 Mark for writing correct statement)

- (ii) Display all the rows where population is more than 40.

Ans

```
print(DF[DF.population>40])
OR
print(DF[DF['population']>40])
```

(1 Mark for writing correct statement)

- (iii) Delete the last 2 rows.

Ans

```
DF.drop(DF.tail(2).index,inplace=True)
OR
DF=DF.drop(axis=0,labels=['FR','PO'])
OR
DF=DF.drop(['FR','PO'])
OR
DF.drop(DF.index[[3,4]], inplace=True)
```

(1 Mark for writing correct statement)

- 39 (a) Write the SQL functions which will perform the following operations :

5

- (i) To display the name of the weekday for your date of birth

Ans

```
DAYNAME()
```

		(1 Mark for writing correct function name)																																					
	(ii)	To convert e-mail-id to lowercase																																					
Ans	LCASE () OR LOWER ()																																						
		(1 Mark for writing correct function name)																																					
	(iii)	To count the number of characters in your name																																					
Ans	LENGTH ()																																						
		(1 Mark for writing correct function name)																																					
	(iv)	To display the first character of your name																																					
Ans	LEFT () OR SUBSTR () OR MID () OR SUBSTRING ()																																						
		(1 Mark for writing correct function name)																																					
	(v)	To calculate the average marks secured by the class																																					
Ans	AVG ()																																						
		(1 Mark for writing correct function name)																																					
		OR																																					
	(b)	Consider a table ITEM with the following data :	5																																				
		<table><tr><th>S.No.</th><th>Itemname</th><th>Type</th><th>Stockdate</th><th>Price</th><th>Discount</th></tr><tr><td>1</td><td>Eating Paradise</td><td>Dining Table</td><td>19-02-2002</td><td>11500.58</td><td>25</td></tr><tr><td>2</td><td>Royal Tiger</td><td>Sofa</td><td>22-02-2002</td><td>31000.67</td><td>30</td></tr><tr><td>3</td><td>Decent</td><td>Office Table</td><td>01-01-2002</td><td>25000.623</td><td>30</td></tr><tr><td>4</td><td>Pink Feather</td><td>Baby Cot</td><td>20-01-2001</td><td>7000.3</td><td>20</td></tr><tr><td>5</td><td>White Lotus</td><td>Double Bed</td><td>23-02-2002</td><td>NULL</td><td>25</td></tr></table>	S.No.	Itemname	Type	Stockdate	Price	Discount	1	Eating Paradise	Dining Table	19-02-2002	11500.58	25	2	Royal Tiger	Sofa	22-02-2002	31000.67	30	3	Decent	Office Table	01-01-2002	25000.623	30	4	Pink Feather	Baby Cot	20-01-2001	7000.3	20	5	White Lotus	Double Bed	23-02-2002	NULL	25	
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		Write SQL queries using SQL functions to perform the following operations :																																					
	(i)	Display the first 3 characters of the Itemname.																																					
Ans	SELECT LEFT (Itemname,3) FROM ITEM ; OR SELECT MID (Itemname,1,3) FROM ITEM ; OR SELECT SUBSTR (Itemname,1,3) FROM ITEM ; OR SELECT SUBSTRING (Itemname,1,3) FROM ITEM ;																																						
		(1 Mark for writing statement using correct function name)																																					
	(ii)	Display the month name from the Stockdate.																																					
Ans	SELECT MONTHNAME (Stockdate) FROM ITEM ;																																						
		(1 Mark for writing statement using correct function name)																																					

	(iii) Display the total price of the whole stock.																					
	Ans SELECT SUM(Price) FROM ITEM ;																					
	(1 Mark for writing statement using correct function name)																					
	(iv) Display the average Price of all the stocks.																					
	Ans SELECT AVG(Price) FROM ITEM ;																					
	(1 Mark for writing statement using correct function name)																					
	(v) Display all the Price round off up to 2 decimal places.																					
	Ans SELECT ROUND(Price,2) FROM ITEM ;																					
	(1 Mark for writing statement using correct function name)																					
40	<p>ABC International School, Delhi has different wings as shown in the diagram :</p> <div><div><div>ADMINISTRATIVE WING (W1)</div></div><div><div>PRIMARY WING (W2)</div></div><div><div>MIDDLE WING (W3)</div></div><div><div>SECONDARY WING (W4)</div></div></div> <p>Distance between the wings are as follows :</p> <table><tr><td>W3 to W1</td><td>70 m</td></tr><tr><td>W1 to W2</td><td>40 m</td></tr><tr><td>W2 to W4</td><td>15 m</td></tr><tr><td>W4 to W3</td><td>100 m</td></tr><tr><td>W3 to W2</td><td>120 m</td></tr><tr><td>W1 to W4</td><td>80 m</td></tr></table> <p>Number of computers in each of the wings :</p> <table><tr><td>W1</td><td>125</td></tr><tr><td>W2</td><td>40</td></tr><tr><td>W3</td><td>42</td></tr><tr><td>W4</td><td>60</td></tr></table> <p>Based on the above information, answer the following questions :</p>	W3 to W1	70 m	W1 to W2	40 m	W2 to W4	15 m	W4 to W3	100 m	W3 to W2	120 m	W1 to W4	80 m	W1	125	W2	40	W3	42	W4	60	5
W3 to W1	70 m																					
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W1	125																					
W2	40																					
W3	42																					
W4	60																					
	(a) Suggest the most suitable cable layout for the above connections.																					

Ans		
	(1 Mark for the suggesting the correct layout)	
(b)	In which wing would you place the server ? Explain the reason for your selection.	
Ans	Administrative Wing. It has the maximum number of computers	
	(½ Mark for the writing the correct placement of the server) (½ Mark for the writing the correct reason)	
(c)	Suggest the kind of network required (out of LAN, MAN, WAN) for connecting Administrative Wing and Middle Wing.	
Ans	LAN	
	(1 Mark for the suggesting the correct network type)	
(d)	Suggest the placement of the following devices with justification :	
(i)	Repeater	
Ans	Not required OR W1 to W4 (as the distance > 70m)	
	(1 Mark for the suggesting the correct placement)	
(ii)	Switch/Hub	
Ans	In each building	
	(1 Mark for the suggesting the correct placement)	
(e)	There is one more branch of ABC International School in Mussoorie. The schools want to link ABC International School, Delhi with ABC International School, Mussoorie. Suggest the software(s) or app(s) to share the files and videos.	
Ans	Google Drive Whatsapp Email attachments Microsoft Onedrive (Any one)	
	(1 Mark for the suggesting any one correct software or app for the purpose)	
	Questions for visually impaired students only :	
	With reference to computer networking, answer the following questions briefly :	5

	(a) What is the significance of a switch in a computer network ?	
Ans	It is an intelligent networking device used to connect multiple computers in a network	
	<i>(1 Mark for writing the correct significance)</i>	
	(b) Mention the name of any two network topologies.	
Ans	STAR, BUS	
	<i>(½ Mark for writing each correct name)</i>	
	(c) What is MODEM ?	
Ans	It stands for Modulator-Demodulator used to convert analogue signals to digital signals and vice versa	
	<i>(1 Mark for writing the correct explanation)</i>	
	(d) Explain Gateway briefly.	
Ans	Gateway is a key access point that acts as a gate between an organisation's network (Intranet) and outer network (Internet).	
	<i>(1 Mark for writing the correct explanation)</i>	
	(e) Expand VoIP.	
Ans	Voice over Internet Protocol	
	<i>(1 Mark for writing the correct expansion)</i>	