



Series **ΣHEFG/C**



Set-4

Q.P. Code **90**

Roll No.

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Candidates must write the Q.P. Code on the title page of the answer-book.

INFORMATICS PRACTICES

Time allowed : 3 hours

Maximum Marks : 70

- Please check that this question paper contains **13** printed pages.
- Q.P. Code given on the right hand side of the question paper should be written on the title page of the answer-book by the candidate.
- Please check that this question paper contains **35** questions.
- **Please write down the serial number of the question in the answer-book before attempting it.**
- 15 minute time has been allotted to read this question paper. The question paper will be distributed at 10.15 a.m. From 10.15 a.m. to 10.30 a.m., the students will read the question paper only and will not write any answer on the answer-book during this period.

General Instructions :

- This question paper contains five sections, **Section A to E**.*
- All** questions are compulsory.*
- Section A** has **18** questions carrying **1** mark each.*
- Section B** has **7** Very Short Answer type questions carrying **2** marks each.*
- Section C** has **5** Short Answer type questions carrying **3** marks each.*
- Section D** has **3** Long Answer type questions carrying **5** marks each.*
- Section E** has **2** questions carrying **4** marks each. **One** internal choice is given in **Q. 35** against Part **E** only.*
- All** programming question are to be answered using Python language only.*



Section A

1. A _____ is a network device that can receive the data, analyse it and transmit it to other networks. 1
(a) Modem (b) Switch
(c) Repeater (d) Router
2. We need to exhibit proper manners and etiquettes while being online. Pick up one such net etiquette from the following : 1
(a) Do not share the expertise
(b) Respect privacy and diversity
(c) Feed the troll
(d) Copyright violation
3. A patent protects an invention for _____ years, after which it can be freely used. 1
(a) 40 (b) 30
(c) 20 (d) 10
4. Write the output of the following SQL query : 1
SELECT LCASE (SUBSTR ("Project Management", 9, 6)) ;
(a) Manag (b) Manage
(c) MANAGE (d) manage
5. Write the output of the following SQL command : 1
select pow (2, 2*2) ;
(a) 16 (b) 2
(c) 4 (d) 8
6. E-waste contains _____ that causes respiratory disorders and brain damage. 1
(a) Cadmium (b) Beryllium
(c) Lead (d) Mercury



7. In SQL, _____ returns the month name from the specified date. 1
- (a) MONTH()
 - (b) DATE()
 - (c) MONTHNAME()
 - (d) NOW()
8. Which of the following SQL function returns the number of values in the specified column ignoring the NULL values ? 1
- (a) COUNT(*)
 - (b) COUNT(columnname)
 - (c) LENGTH(*)
 - (d) LENGTH(columnname)
9. _____ helps to fetch a group of rows based on common values in a column. 1
- (a) ORDER BY
 - (b) FILTER
 - (c) GROUP BY
 - (d) SELECT BY
10. What will be the output of the Python program mentioned below ? 1
- ```
import pandas as pd
df=pd.DataFrame(['Apple','Banana','Orange','Grapes','Guava'])
print(df[2:4:2])
```
- (a) 0  
2 Banana
  - (b) 0  
2 Orange
  - (c) 0  
2 Banana  
4 Grapes
  - (d) Empty DataFrame  
Columns: [0]  
Index: [ ]



11. Which of the following is a one-dimensional array containing a sequence of values in Python ? 1
- (a) Relation (b) DataFrame  
(c) Series (d) Square
12. In Python Pandas, head(n) method returns the first n members of the series. What is the default value of n ? 1
- (a) 2 (b) 3  
(c) 4 (d) 5
13. \_\_\_\_\_ is a service that allows to put a website or a web page on the Internet. 1
- (a) Web Server  
(b) Web Browser  
(c) Web Hosting  
(d) Domain Name System
14. Find the output of the following SQL queries : 1
- Select INSTR("Data Science","ie");**
- (a) 8 (b) - 5  
(c) True (d) False
15. Rupam created an assistive device for the blind. This device is very helpful for the blind and people with low vision. Now, she wants that no one should copy her innovation. What should she do ? 1
- (a) Get the trademark for her invention  
(b) Get the license for her invention  
(c) Get the patent for her invention  
(d) Get the copyright for her invention
16. Presenting someone else's idea or work as one's own idea or work is called : 1
- (a) Phishing (b) Stacking  
(c) Plagiarism (d) Bullying



**For Questions number 17 and 18, two statements are given — one labelled as Assertion (A) and the other labelled as Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below.**

- (a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).
- (b) Both Assertion (A) and Reason (R) are true, but Reason (R) is **not** the correct explanation of Assertion (A).
- (c) Assertion (A) is true, but Reason (R) is false.
- (d) Assertion (A) is false, but Reason (R) is true.

**17.** *Assertion (A) :* Modem stands for ‘Modulator Demodulator’.

*Reason (R) :* The modem at the sender’s end acts as a demodulator that converts the digital data into analogue signals and at the receiver’s end acts as a modulator that converts analogue signals into digital data.

1

**18.** *Assertion (A) :* In order to be able to use Python’s data visualization library, we need to import the pyplot module from matplotlib library.

*Reason (R) :* The pyplot module houses a variety of functions required to create and customize charts or graphs.

1

### **Section B**

**19.** (a) Write any one main advantage and one main disadvantage of Star Topology.

2

**OR**

(b) With reference to browsing the websites, briefly explain the term cookie. Also mention any two points of significance of it.

2



20. Arpit wants to find the total commission earned by those departments where the number of employees in the department is more than 2 and writes the following query :

```
Select department, count(commission) from TECHNO having count(*)>2 group by department;
```

But he got an error. Identify the error(s) and rewrite the query by underlining the correction(s) done.

2

21. Ananya, a database executive, needs to display a system's current date and time. Suggest to her a suitable SQL function name. Also write the query for the same.

2

22. Shobit needs to create the following two series named 'Eng' and 'Math'. Help him to create a DataFrame 'mydata' from the given series 'Eng' and 'Math'.

2

| Eng    |       | Math   |       |
|--------|-------|--------|-------|
| Aditi  | 25    | Aditi  | 9     |
| bhavuk | 21    | bhavuk | 29    |
| chirag | 23    | chirag | 15    |
| deepak | 24    | deepak | 14    |
| Gaurav | 27    | Gaurav | 20    |
| dtype: | int64 | dtype: | int64 |

23. (a) What do you understand by Copyright Infringement ? What can be done as a user to avoid Copyright Infringement ?

2

**OR**

- (b) What is meant by Trademark Infringement ? What action can the owner take against someone who infringes its registered trademark ?

2

24. What will be the output of the following code ?

2

```
import pandas as pd
S1=pd.Series(data=[1,7])
S2=pd.Series(S1+S1)
print(S2)
```



25. Carefully observe the following code : 2

```
import pandas as pd
product={'prodid':pd.Series([1,2,3,4,5]),
 'pname':pd.Series(['pen', 'pencil', 'eraser',
 'color', 'sharpener']),
 'qty':pd.Series([2,10,10,30,10]),
 'price':pd.Series([300,20,50,40,15])}
stock=pd.DataFrame(product)
print(stock)
```

Write Python statements for the following :

- (i) Display the names of products.
- (ii) Rename the column 'price' to 'newprice' in the DataFrame stock.

### Section C

26. Consider the table Customer given below and write SQL commands : 3

**TABLE : Customer**

| CustID | Name     | Country  | Emailid         | Orderdate  |
|--------|----------|----------|-----------------|------------|
| C1001  | Rajat    | India    | rajat@gmail.com | 2022-12-22 |
| C1002  | Michael  | Denmark  | mic@yahoo.com   | 2023-11-15 |
| C1003  | Riyo     | Thailand | Ri@gmail.com    | 2022-05-06 |
| C1004  | Jennifer | S. Korea | Jen@gmail.com   | 2022-08-07 |
| C1005  | Sudha    | India    | Sud@abc.com     | 2023-01-01 |
| C1006  | Vivek    | Nepal    | viv@xyz.com     | 2023-04-14 |

- (i) Display the details of all customers who have placed the order in the year 2023.
  - (ii) Count the total number of customers from India.
  - (iii) Display the last 9 characters of the email id of all customers of Denmark.
27. Write a program in Python Pandas to create a series "car" from the following Dictionary : 3

```
dic={
 "Model":["Samurai","Accord","CR-V","Nexon"],
 "Brand":["Suzuki","Honda","Honda","Tata"],
 "Make":[1993,1997,1997,2021]}
```



28. Consider the given DataFrame 'result' :

|   | Name   | Percentile |
|---|--------|------------|
| 0 | Rohit  | 95         |
| 1 | Mohit  | 76         |
| 2 | Raman  | 98         |
| 3 | Aditya | 47         |

Write the suitable Python statements for the following :

3

- (i) Add a new column 'Grade' to the dataframe having values A, B, A, C.
- (ii) Add a new row where Name is 'Arti' with Percentile as 92 and Grade A.
- (iii) Display the top 3 rows.

29. (a) Riti received a message that she needs to update the KYC for her Bank Account therefore she should upload her Aadhar Card, Bank Account Number and the OTP on the link given in her message.

Answer the following questions :

3

- (i) Should Riti upload the documents and give the OTP on the link ?
- (ii) Should Riti call her bank immediately to recheck the validity of the message received ?
- (iii) What is the act mentioned in the message known as ?

**OR**

(b) Briefly explain the term FOSS. Give examples of any 2 Operating Systems that are FOSS.

3

30. (a) Write the output (i-iii) for the following SQL commands :

3

Table : CLUB

| SNo | Activity | Fee   | Days  |
|-----|----------|-------|-------|
| 1   | Swimming | 10000 | M, W  |
| 2   | Singing  | 8000  | Th, S |
| 3   | Dance    | 12000 | M, W  |
| 4   | Drawing  | 7000  | T, Th |
| 5   | Craft    | 8000  | F, S  |
| 6   | Cooking  | 9000  | T, F  |





- (i) `SELECT COUNT(*) FROM CLUB;`
- (ii) `SELECT SUM(Fee) FROM CLUB;`
- (iii) `SELECT LEFT(Activity,2) FROM CLUB WHERE Days='M,W';`

**OR**

- (b) Find the output of the following SQL queries : 3
- (i) `SELECT MID("Exam",1,2);`
  - (ii) `SELECT MONTHNAME("2023-05-30");`
  - (iii) `SELECT MONTH("2023-03-05");`

### Section D

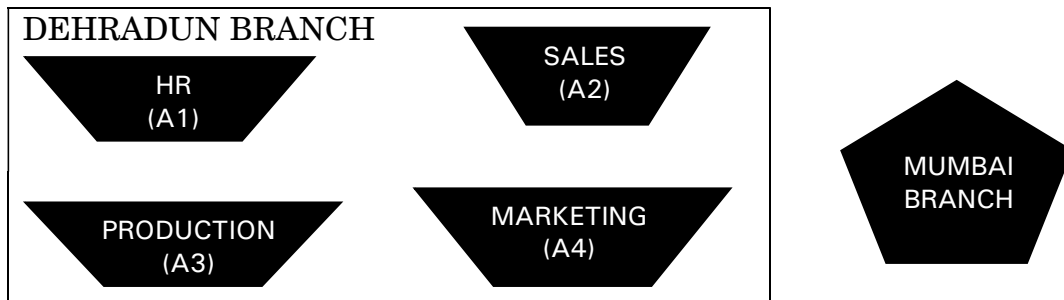
- 31.** (a) Write the SQL queries which will perform the following operations : 5
- (i) To display the day part from your date of admission, which is '2023-12-13'.
  - (ii) To convert your father's email id 'xyz@abc.com' to uppercase.
  - (iii) To count the number of characters in the string 'India'.
  - (iv) To display today's day name i.e., Sunday or Monday ...
  - (v) To display your height 5.41 after rounding off to 1 decimal place.

**OR**

- (b) Explain the following SQL functions using suitable examples : 5
- (i) `LTRIM( )`
  - (ii) `RTRIM( )`
  - (iii) `INSTR( )`
  - (iv) `MOD( )`
  - (v) `TRIM( )`



32. AWESOME Private Ltd, Dehradun is a company that deals with hardware components. They have different divisions HR (A1), Sales (A2), Production (A3) and Marketing (A4). The layout of the Dehradun branch is :



The company also has a branch in Mumbai. The management wants to connect all the divisions as well as the computers of each division (A1, A2, A3, A4).

Distance between the wings are as follows :

|                                       |         |
|---------------------------------------|---------|
| A3 to A1                              | 32m     |
| A1 to A2                              | 53m     |
| A2 to A4                              | 29m     |
| A4 to A3                              | 110m    |
| A3 to A2                              | 750m    |
| A1 to A4                              | 200m    |
| Dehradun Head Office to Mumbai Office | 1656 KM |

Number of computers in each wing :

|    |     |
|----|-----|
| A1 | 70  |
| A2 | 140 |
| A3 | 55  |
| A4 | 70  |

Based on the above specifications, answer the following questions :

5

- Suggest the topology and draw the most efficient cable layout for connecting all the divisions of the Dehradun branch.
- Suggest the kind of network required (out of LAN, MAN, WAN) for connecting Production (A3) with Sales (A2).



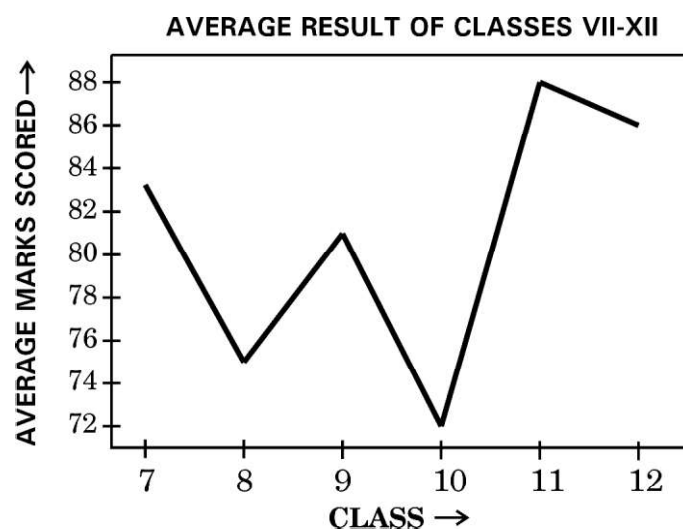
- (c) Suggest the placement of the server. Explain the reasons for your selection.
- (d) Suggest the placement of the Switch/Hub device with justification.
- (e) The company wants to do a collaborative project where the employees of Dehradun and Mumbai would collaborate and do the project. Therefore, the HR planned a series of webinars that employees could attend from their devices being online. Suggest the protocol that helped to send the voice signals over the Internet. Also, give an example of a video conferencing software that helps to connect all the employees.

- 33.** (a) Consider the following graph. Write the Python code to plot it. Also add the Title and Label for X and Y axis.

Use the following data to draw the graph.

5

| Class | Marks |
|-------|-------|
| 7     | 83    |
| 8     | 75    |
| 9     | 81    |
| 10    | 72    |
| 11    | 88    |
| 12    | 86    |



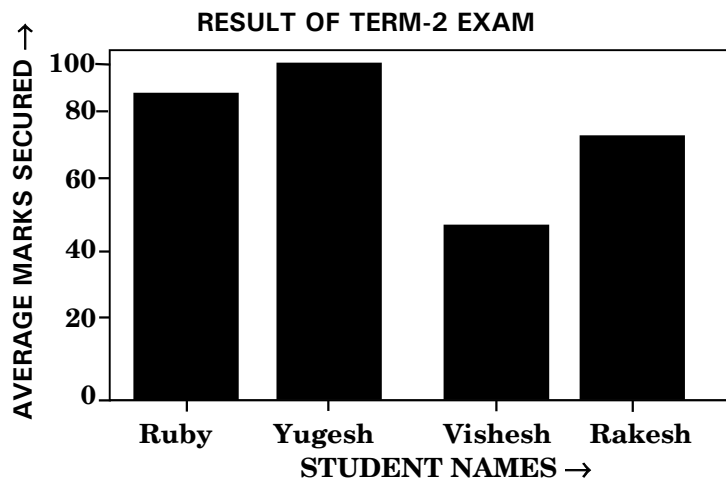
**OR**



- (b) Write a Python code to draw the following bar graph representing the average marks secured by each student in Term-2 Exam. Add the Title and Label for X-axis and Y-axis. Use the following data to draw the graph :

5

| Names   | Average Marks |
|---------|---------------|
| Ruby    | 84            |
| Yugesh  | 92            |
| Vishesh | 45            |
| Rakesh  | 72            |



### Section E

34. Consider the following table Student :

Table : STUDENT

| Admn | Name  | Class | Optional | Marks |
|------|-------|-------|----------|-------|
| 1001 | Tony  | 10    | AI       | 90    |
| 1002 | Ivana | 11    | IP       | 95    |
| 1003 | Nick  | 10    | IT       | 85    |
| 1004 | Sandy | 11    | IP       | 80    |
| 1005 | Kavya | 11    | IP       | 92    |



Write SQL queries for the following :

- (a) Display the Total Marks secured by students of each class. 1
- (b) Display the Average Marks secured by the students of IP optional subject. 1
- (c) Display the total number of students in each Class where the number of students are more than 2. 2

**OR**

- (c) Display the maximum and minimum marks secured in each optional subject. 2

**35.** Consider the following DataFrame 'employee':

| EID | ENAME   | Department | Salary |
|-----|---------|------------|--------|
| 1   | John    | IT         | 50000  |
| 2   | Ria     | MKT        | 45000  |
| 3   | Shobhit | IT         | 55000  |
| 4   | Aditya  | MKT        | 60000  |
| 5   | Rashi   | ADMIN      | 52000  |

- (a) Write Python statements for the DataFrame 'employee':
  - (i) To remove the column 'Salary'. 1
  - (ii) To remove the row having index 4. 1
- (b) Write Python statement to save the DataFrame 'employee' to a CSV file data.csv stored in D:drive of the computer. 2

**OR**

- (b) Write a Python statement to display the new salary i.e., salary increased by 5000 for all employees. 2

# CBSE SSCE 2023 Marking Scheme for Informatics Practices

Series HEFG/C

(Sub Code: 065 Paper Code 90)

SET-4

**Marking Scheme**  
**Strictly Confidential**  
**(For Internal and Restricted use only)**  
**Senior School Certificate Examination, 2023 (Supplementary)**  
**SUBJECT NAME INFORMATICS PRACTICES (SUBJECT CODE 65) (PAPER CODE 90)**  
**(Series: Series HEFG/C)**

## 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 teaching profession. To avoid mistakes, it is requested that before starting evaluation, you must read and understand the spot evaluation guidelines carefully.                                                                                                                                                                                                                                                                               |
| 2  | “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 the 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 News Paper/Website etc may invite action under various rules of the Board and IPC.”                                                                                                                                                                                                       |
| 3  | 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 the given answer and even if the reply is not from the marking scheme but correct competency is enumerated by the candidate, due marks should be awarded. |
| 4  | The Marking scheme carries only suggested value points for the answers<br>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.                                                                                                                                                                                                                                                                                                                                                                                                        |
| 5  | 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.                                                                                                                                                                                                                         |
| 6  | Evaluators will mark( ✓ ) wherever the answer is correct. For wrong answer CROSS ‘X’ be marked. Evaluators will not put right (✓)while evaluating which gives an impression that the answer is correct and no marks are awarded. <b>This is the most common mistake which evaluators are committing.</b>                                                                                                                                                                                                                                                                                                                                                                                         |
| 7  | 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.                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 8  | 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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 9  | 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 with a note “Extra Question”.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 10 | No marks to be deducted for the cumulative effect of an error. It should be penalized only once.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

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Series HEFG/C

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|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 11 | A full scale of marks 0 to 70 has to be used. Please do not hesitate to award full marks if the answer deserves it.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 12 | 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).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 13 | <p>Ensure that you do not make the following common types of errors committed by the Examiner in the past:-</p> <ul style="list-style-type: none"><li>• Leaving the answer or part thereof unassessed in an answer book.</li><li>• Giving more marks for an answer than assigned to it.</li><li>• Wrong totaling of marks awarded on an answer.</li><li>• Wrong transfer of marks from the inside pages of the answer book to the title page.</li><li>• Wrong question wise totaling on the title page.</li><li>• Wrong totaling of marks of the two columns on the title page.</li><li>• Wrong grand total.</li><li>• Marks in words and figures not tallying/not same.</li><li>• Wrong transfer of marks from the answer book to online award list.</li><li>• 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.)</li><li>• Half or a part of the answer marked correct and the rest as wrong, but no marks awarded.</li></ul> |
| 14 | 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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 15 | Any un-assessed 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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 16 | The Examiners should acquaint themselves with the guidelines given in the “ <b>Guidelines for spot Evaluation</b> ” before starting the actual evaluation.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 17 | 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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 18 | The candidates are entitled to obtain a 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.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

## SPECIFIC INSTRUCTIONS FOR INFORMATICS PRACTICES ONLY

|   |                                                                                                                                |
|---|--------------------------------------------------------------------------------------------------------------------------------|
| 1 | In Python, string content is accepted within a pair of single quotes ' ' or within a pair of double quotes " ".                |
| 2 | In MySQL, CHAR/VARCHAR/DATE type content is accepted within a pair of single quotes ' ' or within a pair of double quotes " ". |
| 3 | In MySQL commands, lowercase/UPPERCASE both are correct.                                                                       |
| 4 | In MySQL output questions, column headings to be ignored.                                                                      |
| 5 | In MySQL output questions, alignment (left/right) of content to be ignored.                                                    |
| 6 | All answers/codes are suggestive, any other alternative correct answers to be accepted.                                        |

# CBSE SSCE 2023 Marking Scheme for Informatics Practices

Series HEFG/C

(Sub Code: 065 Paper Code 90)

SET-4

## General Instructions:

- (i) This question paper contains five sections, Section A to E.
- (ii) All questions are compulsory.
- (iii) Section A has 18 questions carrying 1 mark each.
- (iv) Section B has 7 Very Short Answer type questions carrying 2 marks each.
- (v) Section C has 5 Short Answer type questions carrying 3 marks each.
- (vi) Section D has 3 Long Answer type questions carrying 5 marks each.
- (vii) Section E has 2 questions carrying 4 marks each. One internal choice is given in Q. 35 against Part E only.
- (viii) All programming questions are to be answered using Python language only.

|        | Section A                                                                                                                                                                                                                                                                                                                                                   |   |
|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
| 1.     | <p>A _____ is a network device that can receive the data, analyse it and transmit it to other networks.</p> <div style="display: flex; justify-content: space-between;"> <span>(a) Modem</span> <span>(b) Switch</span> </div> <div style="display: flex; justify-content: space-between;"> <span>(c) Repeater</span> <span>(d) Router</span> </div>        | 1 |
| Ans 1. | d) Router                                                                                                                                                                                                                                                                                                                                                   |   |
|        | <b>(1 Mark for Correct Answer)</b>                                                                                                                                                                                                                                                                                                                          |   |
| 2.     | <p>We need to exhibit proper manners and etiquettes while being online. Pick up one such net etiquette from the following :</p> <div style="display: flex; flex-direction: column;"> <span>(a) Do not share the expertise</span> <span>(b) Respect privacy and diversity</span> <span>(c) Feed the troll</span> <span>(d) Copyright violation</span> </div> | 1 |
| Ans 2. | (b) Respect privacy and diversity                                                                                                                                                                                                                                                                                                                           |   |
|        | <b>(1 Mark for Correct Answer)</b>                                                                                                                                                                                                                                                                                                                          |   |
| 3.     | <p>A patent protects an invention for _____ years, after which it can be freely used.</p> <div style="display: flex; justify-content: space-between;"> <span>(a) 40</span> <span>(b) 30</span> </div> <div style="display: flex; justify-content: space-between;"> <span>(c) 20</span> <span>(d) 10</span> </div>                                           | 1 |
| Ans 3. | (c) 20                                                                                                                                                                                                                                                                                                                                                      |   |
|        | <b>(1 Mark for Correct Answer)</b><br><b>Note:</b><br><b>Full 1 mark to be awarded if question not/wrongly attempted, but question 16 and/or question 23 (a) is/are correctly attempted.</b>                                                                                                                                                                |   |
| 4.     | <p>Write the output of the following SQL query :</p> <pre>SELECT LCASE(SUBSTR("Project Management",9,6)) ;</pre> <div style="display: flex; justify-content: space-between;"> <span>(a) Manag</span> <span>(b) Manage</span> </div> <div style="display: flex; justify-content: space-between;"> <span>(c) MANAGE</span> <span>(d) manage</span> </div>     | 1 |



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|        |                                                                                                                                                                                                         |   |
|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
| Ans 4. | (d) manage                                                                                                                                                                                              |   |
|        | <b>(1 Mark for Correct Answer)</b>                                                                                                                                                                      |   |
| 5.     | Write the output of the following SQL command :<br><code>select pow(2,2*2) ;</code><br>(a) 16 (b) 2<br>(c) 4 (d) 8                                                                                      | 1 |
| Ans 5. | (a) 16                                                                                                                                                                                                  |   |
|        | <b>(1 Mark for Correct Answer)</b>                                                                                                                                                                      |   |
| 6.     | E-waste contains_____that causes respiratory disorders and brain damage.<br>(a) Cadmium (b) Beryllium<br>(c) Lead (d) Mercury                                                                           | 1 |
| Ans 6. | Any one/two/three or all of the given option(s) to be accepted as correct answer.                                                                                                                       |   |
|        | <b>(1 Mark for marking any one/two/three or all of the given option(s))</b>                                                                                                                             |   |
| 7.     | In SQL,_____returns the month name from the specified date.<br>(a) MONTH()<br>(b) DATE()<br>(c) MONTHNAME()<br>(d) NOW()                                                                                | 1 |
| Ans 7. | (c) MONTHNAME()                                                                                                                                                                                         |   |
|        | <b>(1 Mark for Correct Answer)</b>                                                                                                                                                                      |   |
| 8.     | Which of the following SQL function returns the number of values in the specified column ignoring the NULL values ?<br>(a) COUNT(*)<br>(b) COUNT(columnname)<br>(c) LENGTH(*)<br>(d) LENGTH(columnname) | 1 |
| Ans 8. | (b) COUNT(columnname)                                                                                                                                                                                   |   |
|        | <b>(1 Mark for Correct Answer)</b>                                                                                                                                                                      |   |
| 9.     | _____ helps to fetch a group of rows based on common values in a column.<br>(a) ORDER BY (b) FILTER<br>(c) GROUP BY (d) SELECT BY                                                                       | 1 |
| Ans 9. | (c) GROUP BY                                                                                                                                                                                            |   |
|        | <b>(1 Mark for Correct Answer)</b>                                                                                                                                                                      |   |

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|         |                                                                                                                                                                                                                                                                                                                                            |   |
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| 10.     | <p>What will be the output of the Python program mentioned below ?</p> <pre>import pandas as pd df=pd.DataFrame(['Apple','Banana','Orange','Grapes','Guava']) print(df[2:4:2])</pre> <p>(a) 0<br/>2 Banana</p> <p>(b) 0<br/>2 Orange</p> <p>(c) 0<br/>2 Banana<br/>4 Grapes</p> <p>(d) Empty DataFrame<br/>Columns: [0]<br/>Index: [ ]</p> | 1 |
| Ans 10. | (b) 0<br>2 Orange                                                                                                                                                                                                                                                                                                                          |   |
|         | <b>(1 Mark for Correct Answer)</b>                                                                                                                                                                                                                                                                                                         |   |
| 11.     | <p>Which of the following is a one-dimensional array containing a sequence of values in Python ?</p> <p>(a) Relation (b) DataFrame</p> <p>(c) Series (d) Square</p>                                                                                                                                                                        | 1 |
| Ans 11. | (c) Series                                                                                                                                                                                                                                                                                                                                 |   |
|         | <b>(1 Mark for Correct Answer)</b>                                                                                                                                                                                                                                                                                                         |   |
| 12.     | <p>In Python Pandas, head(n) method returns the first n members of the series. What is the default value of n ?</p> <p>(a) 2 (b) 3</p> <p>(c) 4 (d) 5</p>                                                                                                                                                                                  | 1 |
| Ans 12. | (d) 5                                                                                                                                                                                                                                                                                                                                      |   |
|         | <b>(1 Mark for Correct Answer)</b>                                                                                                                                                                                                                                                                                                         |   |
| 13.     | <p>_____ is a service that allows to put a website or a web page on the Internet.</p> <p>(a) Web Server</p> <p>(b) Web Browser</p> <p>(c) Web Hosting</p> <p>(d) Domain Name System</p>                                                                                                                                                    | 1 |
| Ans 13. | (c) Web Hosting                                                                                                                                                                                                                                                                                                                            |   |
|         | <b>(1 Mark for Correct Answer)</b>                                                                                                                                                                                                                                                                                                         |   |

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|         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |   |
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| 14.     | Find the output of the following SQL queries :<br><code>Select INSTR("Data Science","ie") ;</code><br><br>(a) 8<br>(b) -5<br>(c) True<br>(d) False                                                                                                                                                                                                                                                                                                                                                                                                                                 | 1 |
| Ans 14. | (a) 8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |   |
|         | <b>(1 Mark for Correct Answer)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |   |
| 15.     | Rupam created an assistive device for the blind. This device is very helpful for the blind and people with low vision. Now, she wants that no one should copy her innovation. What should she do ?<br><br>(a) Get the trademark for her invention<br>(b) Get the license for her invention<br>(c) Get the patent for her invention<br>(d) Get the copyright for her invention                                                                                                                                                                                                      | 1 |
| Ans 15. | (c) Get the patent for her invention                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |   |
|         | <b>(1 Mark for Correct Answer)</b><br><b>Note:</b><br><i>Any one/two/three or all of the given option(s) to be accepted as correct answer.</i><br><br><b>Full 1 mark to be awarded if question not/wrongly attempted, but question 16 and/or question 23 (a) is/are correctly attempted.</b>                                                                                                                                                                                                                                                                                       |   |
| 16.     | Presenting someone else's idea or work as one's own idea or work is called:<br><br>(a) Phishing<br>(b) Stacking<br>(c) Plagiarism<br>(d) Bullying                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1 |
| Ans 16. | (c) Plagiarism                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |   |
|         | <b>(1 Mark for Correct Answer)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |   |
|         | <b>For Questions number 17 and 18, two statements are given - one labelled as Assertion(A) and the other labelled as Reason (R). Select the correct answer to these questions from the code(a),(b), (c) and (d) as given below:</b><br><br>(a) Both Assertion (A) and Reason(R) are true and Reason (R) is the correct explanation of Assertion (A).<br>(b) Both Assertion (A) and Reason(R) are true, but Reason (R) is not the correct explanation of Assertion (A).<br>(c) Assertion (A) is true but Reason (R) is false.<br>(d) Assertion (A) is false but Reason (R) is true. |   |

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|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |   |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
| 17.         | <p><b>Assertion (A):</b> Modem stands for ‘Modulator Demodulator’</p> <p><b>Reason (R):</b> The modem at the sender’s end acts as a demodulator that converts the digital data into analogue signals and at the receiver’s end acts as a modulator that converts analogue signals into digital data.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 1 |
| Ans 17.     | (c) Assertion(A) is true but Reason(R) is false.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |   |
|             | <b>(1 Mark for Correct Answer)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |   |
| 18.         | <p><b>Assertion (A):</b> In order to be able to use Python’s data visualization library, we need to import the pyplot module from matplotlib library.</p> <p><b>Reason (R):</b> The pyplot module houses a variety of functions required to create and customize charts or graphs.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 1 |
| Ans 18.     | (a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |   |
|             | <b>(1 Mark for Correct Answer)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |   |
|             | <b>Section B</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |   |
| 19. (a)     | Write any one main advantage and one main disadvantage of Star Topology.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 2 |
| Ans 19. (a) | <p><b>One main advantage of Star Topology:</b><br/>Centralized control and management makes it easy to monitor, troubleshoot, and scale the network.</p> <p><b>Other points to be accepted:</b></p> <ul style="list-style-type: none"> <li>reliable - if one cable or device fails then all the others will still work.</li> <li>high-performing as no data collisions can occur.</li> <li>Easier to install.</li> <li>Easy fault detection.</li> <li>No disruptions to the network when connecting or removing devices.</li> </ul> <p><b>Or Any other valid point.</b></p> <p><b>One main disadvantage of Star Topology :</b><br/>Dependence on the central hub or switch. If the central hub fails, the entire network becomes inaccessible.</p> <p><b>Other points to be accepted:</b></p> <ul style="list-style-type: none"> <li>More Cable required</li> <li>More expensive.</li> </ul> <p><b>Or Any other valid point</b></p> |   |
|             | <p><b>(1 Mark for Any one correct advantage)</b><br/><b>(1 Mark for Any one correct disadvantage)</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |   |
|             | <b>OR</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |   |

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|         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |   |
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| (b)     | With reference to browsing the websites, briefly explain the term cookie. Also mention any two points of significance of it.                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 2 |
| Ans (b) | <p>A cookie is a small piece of data that a website sends to a user's web browser. The browser stores this data and sends it back to the website each time the user visits it again.</p> <p>Any two points of significance of cookies from the following:</p> <ol style="list-style-type: none"> <li>1. Helps in analyzing the user's browsing pattern/interests.</li> <li>2. Helps in recognizing the user's computer activity(website's loginids, shopping carts)</li> <li>3. Helps in customizing the website's experience for a user.</li> </ol> <p><b>Or Any other valid point</b></p> |   |
|         | <p><b>(1 Mark for explaining the term)</b><br/> <b>(½ Mark each for any two correct points of Significance)</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |   |
| 20.     | <p>Arpit wants to find the total commission earned by those departments where the number of employees in the department is more than 2 and writes the following query :</p> <pre>Select department, count(commission) from TECHNO having count(*)&gt;2 group by department;</pre> <p>But he got an error. Identify the error(s) and rewrite the query by underlining the correction(s) done.</p>                                                                                                                                                                                            | 2 |
| Ans 20. | <p><b>Error 1 : SUM(commission) in place of count(commission)</b><br/> <b>Error 2 : having should be after group by</b></p> <p><b>Corrected Query:</b><br/> <b>SELECT department, <u>SUM(commission)</u> FROM TECHNO</b><br/> <b>GROUP BY department <u>HAVING count(*)&gt;2</u> ;</b></p>                                                                                                                                                                                                                                                                                                  |   |
|         | <p><b>(½ Mark each for Identifying each of the two errors)</b><br/> <b>(½ Mark each for rewriting query after correcting each of the two errors)</b></p> <p><b>Note: Full 2 Marks to be awarded if only corrected query is written.</b></p>                                                                                                                                                                                                                                                                                                                                                 |   |
| 21.     | Ananya, a database executive, needs to display a system's current date and time. Suggest to her a suitable SQL function name. Also write the query for the same.                                                                                                                                                                                                                                                                                                                                                                                                                            | 2 |
| Ans 21. | <p><b>NOW()</b><br/> <b>SELECT NOW();</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |   |
|         | <p><b>(1 Mark for writing NOW())</b><br/> <b>(1 Mark for correct query)</b><br/> <b>Note: Full 2 Marks to be awarded if only correct query is written.</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                              |   |

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| 22.            | <p>Shobit needs to create the following two series named 'Eng' and 'Math'. Help him to create a DataFrame 'mydata' from the given series 'Eng' and 'Math'.</p> <table><tr><th>Eng</th><th>Math</th></tr><tr><td>Aditi 25</td><td>Aditi 9</td></tr><tr><td>bhavuk 21</td><td>bhavuk 29</td></tr><tr><td>chirag 23</td><td>chirag 15</td></tr><tr><td>deepak 24</td><td>deepak 14</td></tr><tr><td>Gaurav 27</td><td>Gaurav 20</td></tr><tr><td>dtype: int64</td><td>dtype: int64</td></tr></table>                                                                                                           | Eng | Math | Aditi 25 | Aditi 9 | bhavuk 21 | bhavuk 29 | chirag 23 | chirag 15 | deepak 24 | deepak 14 | Gaurav 27 | Gaurav 20 | dtype: int64 | dtype: int64 | 2 |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|----------|---------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|--------------|--------------|---|
| Eng            | Math                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |     |      |          |         |           |           |           |           |           |           |           |           |              |              |   |
| Aditi 25       | Aditi 9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |     |      |          |         |           |           |           |           |           |           |           |           |              |              |   |
| bhavuk 21      | bhavuk 29                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |      |          |         |           |           |           |           |           |           |           |           |              |              |   |
| chirag 23      | chirag 15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |      |          |         |           |           |           |           |           |           |           |           |              |              |   |
| deepak 24      | deepak 14                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |      |          |         |           |           |           |           |           |           |           |           |              |              |   |
| Gaurav 27      | Gaurav 20                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     |      |          |         |           |           |           |           |           |           |           |           |              |              |   |
| dtype: int64   | dtype: int64                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |     |      |          |         |           |           |           |           |           |           |           |           |              |              |   |
| Ans 22.        | <pre>import pandas as pd eng_data = {'Aditi': 25, 'bhavuk': 21, 'chirag': 23, 'deepak': 24, 'Gaurav': 27}  Eng = pd.Series(eng_data, name='Eng')  math_data = {'Aditi': 9, 'bhavuk': 29, 'chirag': 15, 'deepak': 14, 'Gaurav': 20}  Math = pd.Series(math_data, name='Math')  mydata = pd.DataFrame({'Eng': Eng, 'Math': Math})  OR  import pandas as pd Eng = pd.Series([25,21,23,24,27], index=['Aditi','bhavuk','chirag','deepak','Gaurav'],name='Eng') Math = pd.Series([9,29,15,14,20], index=['Aditi','bhavuk','chirag','deepak','Gaurav'],name='Math') mydata = pd.concat([Eng, Math], axis=1)</pre> |     |      |          |         |           |           |           |           |           |           |           |           |              |              |   |
|                | <p><i>(½ Mark each for creating two series)</i><br/><i>(1 Mark for creating DataFrame from the two series)</i></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |     |      |          |         |           |           |           |           |           |           |           |           |              |              |   |
| 23.<br>(a)     | <p>What do you understand about Copyright Infringement ? What can be done as a user to avoid Copyright Infringement ?</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 2   |      |          |         |           |           |           |           |           |           |           |           |              |              |   |
| Ans 23.<br>(a) | <p>Copyright infringement refers to the unauthorized use, reproduction, or distribution of copyrighted material without the permission of the copyright holder.</p> <p>To avoid copyright infringement, users should obtain permission, use licensed content, create their own original works, or use open source content.</p>                                                                                                                                                                                                                                                                              |     |      |          |         |           |           |           |           |           |           |           |           |              |              |   |

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|         |                                                                                                                                                                                                                                                                                                                                                                                                       |   |
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|         | <p><i>(1 Mark for correct definition or explanation of Copyright infringement with/without the help of any example)</i></p> <p><i>(1 Mark for Any one correct suggestion to avoid Copyright Infringement)</i></p>                                                                                                                                                                                     |   |
|         | <b>OR</b>                                                                                                                                                                                                                                                                                                                                                                                             |   |
| (b)     | What is meant by Trademark Infringement ? What action can the owner take against someone who infringes its registered trademark ?                                                                                                                                                                                                                                                                     | 2 |
| Ans (b) | <p>Trademark infringement occurs when someone uses a registered trademark without permission.</p> <p>The owner can take legal action against the infringer, seeking actions like injunctions, damages, orders to cease the infringing activities, to protect their brand and enforce their exclusive rights.</p>                                                                                      |   |
|         | <p><i>(1 Mark for correct meaning)</i><br/> <i>(1 Mark for correct suggestive action)</i></p> <p><b>Note:</b><br/> <i>Full 2 Marks to be awarded if infringement of any Intellectual property is explained and action suggested</i></p> <p><b>OR</b><br/> <i>Full 2 Marks to be awarded if question not/wrongly attempted, but question 16 and/or question 23 (a) is/are correctly attempted.</i></p> |   |
| 24.     | <p>What will be the output of the following code ?</p> <pre>import pandas as pd S1=pd.Series(data=[1,7]) S2=pd.Series(S1+S1) print(S2)</pre>                                                                                                                                                                                                                                                          | 2 |
| Ans 24. | <pre>0      2 1     14</pre>                                                                                                                                                                                                                                                                                                                                                                          |   |
|         | <p><i>(1 Mark for each correct line of output)</i><br/> <b>Note:</b> <i>No Marks to be deducted if indexes are not mentioned.</i></p>                                                                                                                                                                                                                                                                 |   |
| 25.     | <p>Carefully observe the following code :</p> <pre>import pandas as pd product={'prodid':pd.Series([1,2,3,4,5]),         'pname':pd.Series(['pen', 'pencil', 'eraser',         'color', 'sharpener']),         'qty':pd.Series([2,10,10,30,10]),         'price':pd.Series([300,20,50,40,15])} stock=pd.DataFrame(product) print(stock)</pre>                                                         | 2 |

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|         | Write Python statements for the following :<br>(i) Display the names of products.<br>(ii) Rename the column 'price' to 'newprice' in the DataFrame stock.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |          |                 |            |         |           |       |       |       |                 |            |       |         |         |               |            |       |      |          |              |            |       |          |         |               |            |       |       |       |             |            |       |       |       |             |            |   |
|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----------------|------------|---------|-----------|-------|-------|-------|-----------------|------------|-------|---------|---------|---------------|------------|-------|------|----------|--------------|------------|-------|----------|---------|---------------|------------|-------|-------|-------|-------------|------------|-------|-------|-------|-------------|------------|---|
| Ans 25. | (i) <code>print(stock['pname'])</code><br>(ii) <code>stock.rename({'price': 'newprice'},axis='columns', inplace=True)</code><br>OR<br>(ii) <code>stock.rename({'price': 'newprice'},axis=1, inplace=True)</code><br>OR<br>(ii) <code>stock.columns = ['prodid', 'pname', 'qty', 'newprice']</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |          |                 |            |         |           |       |       |       |                 |            |       |         |         |               |            |       |      |          |              |            |       |          |         |               |            |       |       |       |             |            |       |       |       |             |            |   |
|         | (1 Mark for writing each part correctly)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |          |                 |            |         |           |       |       |       |                 |            |       |         |         |               |            |       |      |          |              |            |       |          |         |               |            |       |       |       |             |            |       |       |       |             |            |   |
|         | Section C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |          |                 |            |         |           |       |       |       |                 |            |       |         |         |               |            |       |      |          |              |            |       |          |         |               |            |       |       |       |             |            |       |       |       |             |            |   |
| 26.     | Consider the table Customer given below and write SQL commands :<br><br>TABLE : Customer<br><table><tr><th>CustID</th><th>Name</th><th>Country</th><th>Emailid</th><th>Orderdate</th></tr><tr><td>C1001</td><td>Rajat</td><td>India</td><td>rajat@gmail.com</td><td>2022-12-22</td></tr><tr><td>C1002</td><td>Michael</td><td>Denmark</td><td>mic@yahoo.com</td><td>2023-11-15</td></tr><tr><td>C1003</td><td>Riyo</td><td>Thailand</td><td>Ri@gmail.com</td><td>2022-05-06</td></tr><tr><td>C1004</td><td>Jennifer</td><td>S.Korea</td><td>Jen@gmail.com</td><td>2022-08-07</td></tr><tr><td>C1005</td><td>Sudha</td><td>India</td><td>Sud@abc.com</td><td>2023-01-01</td></tr><tr><td>C1006</td><td>Vivek</td><td>Nepal</td><td>viv@xyz.com</td><td>2023-04-14</td></tr></table> | CustID   | Name            | Country    | Emailid | Orderdate | C1001 | Rajat | India | rajat@gmail.com | 2022-12-22 | C1002 | Michael | Denmark | mic@yahoo.com | 2023-11-15 | C1003 | Riyo | Thailand | Ri@gmail.com | 2022-05-06 | C1004 | Jennifer | S.Korea | Jen@gmail.com | 2022-08-07 | C1005 | Sudha | India | Sud@abc.com | 2023-01-01 | C1006 | Vivek | Nepal | viv@xyz.com | 2023-04-14 | 3 |
| CustID  | Name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Country  | Emailid         | Orderdate  |         |           |       |       |       |                 |            |       |         |         |               |            |       |      |          |              |            |       |          |         |               |            |       |       |       |             |            |       |       |       |             |            |   |
| C1001   | Rajat                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | India    | rajat@gmail.com | 2022-12-22 |         |           |       |       |       |                 |            |       |         |         |               |            |       |      |          |              |            |       |          |         |               |            |       |       |       |             |            |       |       |       |             |            |   |
| C1002   | Michael                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Denmark  | mic@yahoo.com   | 2023-11-15 |         |           |       |       |       |                 |            |       |         |         |               |            |       |      |          |              |            |       |          |         |               |            |       |       |       |             |            |       |       |       |             |            |   |
| C1003   | Riyo                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Thailand | Ri@gmail.com    | 2022-05-06 |         |           |       |       |       |                 |            |       |         |         |               |            |       |      |          |              |            |       |          |         |               |            |       |       |       |             |            |       |       |       |             |            |   |
| C1004   | Jennifer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | S.Korea  | Jen@gmail.com   | 2022-08-07 |         |           |       |       |       |                 |            |       |         |         |               |            |       |      |          |              |            |       |          |         |               |            |       |       |       |             |            |       |       |       |             |            |   |
| C1005   | Sudha                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | India    | Sud@abc.com     | 2023-01-01 |         |           |       |       |       |                 |            |       |         |         |               |            |       |      |          |              |            |       |          |         |               |            |       |       |       |             |            |       |       |       |             |            |   |
| C1006   | Vivek                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Nepal    | viv@xyz.com     | 2023-04-14 |         |           |       |       |       |                 |            |       |         |         |               |            |       |      |          |              |            |       |          |         |               |            |       |       |       |             |            |       |       |       |             |            |   |
| (i)     | Display the details of all customers who have placed the order in the year 2023.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |          |                 |            |         |           |       |       |       |                 |            |       |         |         |               |            |       |      |          |              |            |       |          |         |               |            |       |       |       |             |            |       |       |       |             |            |   |
| Ans(i)  | <code>SELECT * FROM Customer WHERE YEAR(Orderdate)=2023;</code><br>OR<br><code>SELECT * FROM Customer WHERE YEAR(Orderdate) IN ('2023');</code><br>OR<br><code>SELECT * FROM Customer WHERE YEAR(Orderdate) IN (2023);</code><br>OR<br><code>SELECT * FROM Customer WHERE YEAR(Orderdate) LIKE '2023';</code><br>OR<br><code>SELECT * FROM Customer WHERE YEAR(Orderdate) LIKE 2023;</code>                                                                                                                                                                                                                                                                                                                                                                                        |          |                 |            |         |           |       |       |       |                 |            |       |         |         |               |            |       |      |          |              |            |       |          |         |               |            |       |       |       |             |            |       |       |       |             |            |   |
|         | (½ Mark for SELECT)<br>(½ Mark for WHERE clause)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |          |                 |            |         |           |       |       |       |                 |            |       |         |         |               |            |       |      |          |              |            |       |          |         |               |            |       |       |       |             |            |       |       |       |             |            |   |



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| (ii)     | Count the total number of customers from India.                                                                                                                                                                                                     |   |
| Ans (ii) | <pre>SELECT COUNT(*) FROM Customer WHERE Country= 'India'; OR SELECT COUNT(Country) FROM Customer WHERE Country = 'India';</pre>                                                                                                                    |   |
|          | <p>(½ Mark for COUNT())<br/>           (½ Mark for WHERE clause)<br/> <b>Note:</b><br/> <i>IN / LIKE operators to be accepted in place of = operator for condition matching</i></p>                                                                 |   |
| (iii)    | Display the last 9 characters of the email id of all customers of Denmark.                                                                                                                                                                          |   |
| Ans(iii) | <pre>SELECT RIGHT(Emailid,9) FROM Customer WHERE Country= 'Denmark'; OR SELECT RIGHT(Emailid,9) FROM Customer WHERE Country IN('Denmark'); OR SELECT RIGHT(Emailid,9) FROM Customer WHERE Country LIKE 'Denmark';</pre>                             |   |
|          | <p>(½ Mark for RIGHT())<br/>           (½ Mark for WHERE clause)</p>                                                                                                                                                                                |   |
| 27.      | <p>Write a program in Python Pandas to create a series “car” from the following Dictionary :</p> <pre>dic={ "Model": ["Samurai", "Accord", "CR-V", "Nexon"], "Brand": ["Suzuki", "Honda", "Honda", "Tata"], "Make": [1993, 1997, 1997, 2021]}</pre> | 3 |
| Ans 27.  | <pre>import pandas as pd  dic = {     "Model": ["Samurai", "Accord", "CR-V", "Nexon"],     "Brand": ["Suzuki", "Honda", "Honda", "Tata"],     "Make": [1993, 1997, 1997, 2021] }  car = pd.Series(dic)</pre>                                        |   |
|          | <p>(1 Mark for import statement)<br/>           (1 Mark for creating dictionary)<br/>           (1 Mark for creating Series from dictionary)</p> <p>(Note: Marks Not to be deducted if instead of Series, DataFrame is created)</p>                 |   |

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|           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |   |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
| 28.       | Consider the given DataFrame 'result':<br><div style="display: flex; justify-content: space-around; margin-top: 5px;"> <div>Name</div> <div>Percentile</div> </div> <div style="display: flex; justify-content: space-around; margin-top: 5px;"> <div>0</div> <div>Rohit</div> <div>95</div> </div> <div style="display: flex; justify-content: space-around; margin-top: 5px;"> <div>1</div> <div>Mohit</div> <div>76</div> </div> <div style="display: flex; justify-content: space-around; margin-top: 5px;"> <div>2</div> <div>Raman</div> <div>98</div> </div> <div style="display: flex; justify-content: space-around; margin-top: 5px;"> <div>3</div> <div>Aditya</div> <div>47</div> </div> Write the suitable Python statements for the following : | 3 |
| (i)       | Add a new column 'Grade' to the dataframe having values A,B,A,C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |   |
| Ans(i)    | <code>result['Grade']=['A','B','A','C']</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |   |
|           | <i>(½ Mark for adding the Column Grade)<br/>(½ Mark for putting the right values)</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |   |
| (ii)      | Add a new row where Name is 'Arti' with Percentile as 92 and Grade A.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |   |
| Ans (ii)  | <code>result.loc[4]=['Arti',92,'A']</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |   |
|           | <i>(½ Mark for using loc)<br/>(½ Mark for putting right values)</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |   |
| (iii)     | Display the top 3 rows.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |   |
| Ans(iii)  | <code>print(result.head(3))</code>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |   |
|           | <i>(½ Mark for print)<br/>(½ Mark for head())</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |   |
| 29. (a)   | Riti received a message that she needs to update the KYC for her Bank Account therefore she should upload her Aadhar Card, Bank Account Number and the OTP on the link given in her message.<br>Answer the following questions :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 3 |
| (i)       | Should Riti upload the documents and give the OTP on the link ?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |   |
| Ans(i)    | No, Riti should not upload the documents and give the OTP on the link                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |   |
|           | <i>(1 Mark for correct answer)</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |   |
| (ii)      | Should Riti call her bank immediately to recheck the validity of the message received ?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |   |
| Ans (ii)  | Yes, Riti should call her bank immediately to recheck the validity of the message received                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |   |
|           | <i>(1 Mark for correct answer)</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |   |
| (iii)     | What is the act mentioned in the message known as ?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |   |
| Ans (iii) | Phishing<br>OR<br>Cyber Crime                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |   |
|           | <i>(1 Mark for correct answer)</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |   |

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|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|-----|----------|-----|------|---|----------|-------|------|---|---------|------|-------|---|-------|-------|------|---|---------|------|-------|---|-------|------|------|---|---------|------|------|--|
|          | OR                                                                                                                                                                                                                                                                                                                                                                                                                                                            |       |       |     |          |     |      |   |          |       |      |   |         |      |       |   |       |       |      |   |         |      |       |   |       |      |      |   |         |      |      |  |
| (b)      | Briefly explain the term FOSS. Give examples of any 2 Operating Systems that are FOSS.                                                                                                                                                                                                                                                                                                                                                                        |       |       | 3   |          |     |      |   |          |       |      |   |         |      |       |   |       |       |      |   |         |      |       |   |       |      |      |   |         |      |      |  |
| Ans (b)  | FOSS (Free and Open-Source Software) refers to software that gives users freedom to study, use, modify, and distribute the software.<br><br>Examples of FOSS operating systems include Linux (e.g., Ubuntu, Fedora) and FreeBSD.                                                                                                                                                                                                                              |       |       |     |          |     |      |   |          |       |      |   |         |      |       |   |       |       |      |   |         |      |       |   |       |      |      |   |         |      |      |  |
|          | (2 Marks for correct explanation)<br>(½ Mark each for Any two valid examples)                                                                                                                                                                                                                                                                                                                                                                                 |       |       |     |          |     |      |   |          |       |      |   |         |      |       |   |       |       |      |   |         |      |       |   |       |      |      |   |         |      |      |  |
| 30. (a)  | Write the output (i-iii) for the following SQL commands :<br><br>Table : CLUB                                                                                                                                                                                                                                                                                                                                                                                 |       |       | 3   |          |     |      |   |          |       |      |   |         |      |       |   |       |       |      |   |         |      |       |   |       |      |      |   |         |      |      |  |
|          | <table><tr><td>SNo</td><td>Activity</td><td>Fee</td><td>Days</td></tr><tr><td>1</td><td>Swimming</td><td>10000</td><td>M, W</td></tr><tr><td>2</td><td>Singing</td><td>8000</td><td>Th, S</td></tr><tr><td>3</td><td>Dance</td><td>12000</td><td>M, W</td></tr><tr><td>4</td><td>Drawing</td><td>7000</td><td>T, Th</td></tr><tr><td>5</td><td>Craft</td><td>8000</td><td>F, S</td></tr><tr><td>6</td><td>Cooking</td><td>9000</td><td>T, F</td></tr></table> |       |       | SNo | Activity | Fee | Days | 1 | Swimming | 10000 | M, W | 2 | Singing | 8000 | Th, S | 3 | Dance | 12000 | M, W | 4 | Drawing | 7000 | T, Th | 5 | Craft | 8000 | F, S | 6 | Cooking | 9000 | T, F |  |
| SNo      | Activity                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Fee   | Days  |     |          |     |      |   |          |       |      |   |         |      |       |   |       |       |      |   |         |      |       |   |       |      |      |   |         |      |      |  |
| 1        | Swimming                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 10000 | M, W  |     |          |     |      |   |          |       |      |   |         |      |       |   |       |       |      |   |         |      |       |   |       |      |      |   |         |      |      |  |
| 2        | Singing                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 8000  | Th, S |     |          |     |      |   |          |       |      |   |         |      |       |   |       |       |      |   |         |      |       |   |       |      |      |   |         |      |      |  |
| 3        | Dance                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 12000 | M, W  |     |          |     |      |   |          |       |      |   |         |      |       |   |       |       |      |   |         |      |       |   |       |      |      |   |         |      |      |  |
| 4        | Drawing                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 7000  | T, Th |     |          |     |      |   |          |       |      |   |         |      |       |   |       |       |      |   |         |      |       |   |       |      |      |   |         |      |      |  |
| 5        | Craft                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 8000  | F, S  |     |          |     |      |   |          |       |      |   |         |      |       |   |       |       |      |   |         |      |       |   |       |      |      |   |         |      |      |  |
| 6        | Cooking                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 9000  | T, F  |     |          |     |      |   |          |       |      |   |         |      |       |   |       |       |      |   |         |      |       |   |       |      |      |   |         |      |      |  |
| (i)      | SELECT COUNT(*) FROM CLUB;                                                                                                                                                                                                                                                                                                                                                                                                                                    |       |       |     |          |     |      |   |          |       |      |   |         |      |       |   |       |       |      |   |         |      |       |   |       |      |      |   |         |      |      |  |
| Ans(i)   | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                             |       |       |     |          |     |      |   |          |       |      |   |         |      |       |   |       |       |      |   |         |      |       |   |       |      |      |   |         |      |      |  |
|          | (1 Mark for correct answer)                                                                                                                                                                                                                                                                                                                                                                                                                                   |       |       |     |          |     |      |   |          |       |      |   |         |      |       |   |       |       |      |   |         |      |       |   |       |      |      |   |         |      |      |  |
| (ii)     | SELECT SUM(Fee) FROM CLUB;                                                                                                                                                                                                                                                                                                                                                                                                                                    |       |       |     |          |     |      |   |          |       |      |   |         |      |       |   |       |       |      |   |         |      |       |   |       |      |      |   |         |      |      |  |
| Ans(ii)  | 54000                                                                                                                                                                                                                                                                                                                                                                                                                                                         |       |       |     |          |     |      |   |          |       |      |   |         |      |       |   |       |       |      |   |         |      |       |   |       |      |      |   |         |      |      |  |
|          | (1 Mark for correct answer)                                                                                                                                                                                                                                                                                                                                                                                                                                   |       |       |     |          |     |      |   |          |       |      |   |         |      |       |   |       |       |      |   |         |      |       |   |       |      |      |   |         |      |      |  |
| (iii)    | SELECT LEFT(Activity,2) FROM CLUB WHERE Days='M,W' ;                                                                                                                                                                                                                                                                                                                                                                                                          |       |       |     |          |     |      |   |          |       |      |   |         |      |       |   |       |       |      |   |         |      |       |   |       |      |      |   |         |      |      |  |
| Ans(iii) | Sw<br>Da                                                                                                                                                                                                                                                                                                                                                                                                                                                      |       |       |     |          |     |      |   |          |       |      |   |         |      |       |   |       |       |      |   |         |      |       |   |       |      |      |   |         |      |      |  |
|          | (½ Mark for each correct line of output)                                                                                                                                                                                                                                                                                                                                                                                                                      |       |       |     |          |     |      |   |          |       |      |   |         |      |       |   |       |       |      |   |         |      |       |   |       |      |      |   |         |      |      |  |
|          | OR                                                                                                                                                                                                                                                                                                                                                                                                                                                            |       |       |     |          |     |      |   |          |       |      |   |         |      |       |   |       |       |      |   |         |      |       |   |       |      |      |   |         |      |      |  |
| (b)      | Find the output of the following SQL queries :                                                                                                                                                                                                                                                                                                                                                                                                                |       |       | 3   |          |     |      |   |          |       |      |   |         |      |       |   |       |       |      |   |         |      |       |   |       |      |      |   |         |      |      |  |
| (i)      | SELECT MID ("Exam" , 1 , 2) ;                                                                                                                                                                                                                                                                                                                                                                                                                                 |       |       |     |          |     |      |   |          |       |      |   |         |      |       |   |       |       |      |   |         |      |       |   |       |      |      |   |         |      |      |  |
| Ans (i)  | Ex                                                                                                                                                                                                                                                                                                                                                                                                                                                            |       |       |     |          |     |      |   |          |       |      |   |         |      |       |   |       |       |      |   |         |      |       |   |       |      |      |   |         |      |      |  |
|          | (1 Mark for correct answer)                                                                                                                                                                                                                                                                                                                                                                                                                                   |       |       |     |          |     |      |   |          |       |      |   |         |      |       |   |       |       |      |   |         |      |       |   |       |      |      |   |         |      |      |  |

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| (ii)     | <b>SELECT MONTHNAME ("2023-05-30") ;</b>                                                                                                                             |   |
| Ans(ii)  | <b>May</b>                                                                                                                                                           |   |
|          | <b>(1 Mark for correct answer)</b>                                                                                                                                   |   |
| (iii)    | <b>SELECT MONTH ("2023-03-05") ;</b>                                                                                                                                 |   |
| Ans(iii) | <b>3</b>                                                                                                                                                             |   |
|          | <b>(1 Mark for correct answer)</b><br><b>Note: 03 to be accepted</b>                                                                                                 |   |
|          | <b>Section D</b>                                                                                                                                                     |   |
| 31. (a)  | Write the SQL queries which will perform the following operations :                                                                                                  | 5 |
| (i)      | To display the day part from your date of admission, which is '2023-12-13'                                                                                           |   |
| Ans(i)   | <b>SELECT DAY ('2023-12-13') ;</b>                                                                                                                                   |   |
|          | <b>(½ Mark for SELECT)</b><br><b>(½ Mark of DAY ())</b>                                                                                                              |   |
| (ii)     | To convert your father's email id 'xyz@abc.com' to uppercase.                                                                                                        |   |
| Ans(ii)  | <b>SELECT UCASE ('xyz@abc.com') ;</b><br><br><b>OR</b><br><b>SELECT UPPER ('xyz@abc.com') ;</b>                                                                      |   |
|          | <b>(½ Mark for SELECT)</b><br><b>(½ Mark of UCASE () /UPPER ())</b>                                                                                                  |   |
| (iii)    | To count the number of characters in the string 'India'                                                                                                              |   |
| Ans(iii) | <b>SELECT LENGTH ('India') ;</b>                                                                                                                                     |   |
|          | <b>(½ Mark for SELECT)</b><br><b>(½ Mark of LENGTH ())</b>                                                                                                           |   |
| (iv)     | To display today's day name i.e., Sunday or Monday ...                                                                                                               |   |
| Ans(iv)  | <b>SELECT DAYNAME (NOW ()) ;</b><br><b>OR</b><br><b>SELECT DAYNAME (SYSDATE ()) ;</b><br><b>OR</b><br><b>SELECT DAYNAME (CURDATE ()) ;</b>                           |   |
|          | <b>(½ Mark for SELECT)</b><br><b>(½ Mark of dayname (now ()))</b><br><b>OR</b><br><b>(½ Mark of dayname (sysdate ()))</b><br><b>(½ Mark of dayname (curdate ()))</b> |   |

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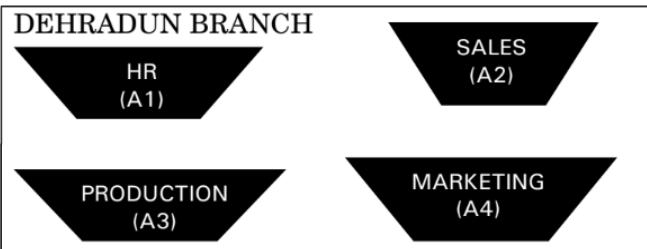

|          |                                                                                                                                                                                                             |   |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
| (v)      | To display your height 5.41 after rounding off to 1 decimal place.                                                                                                                                          |   |
| Ans(v)   | <b>SELECT ROUND (5.41,1) ;</b>                                                                                                                                                                              |   |
|          | <i>(½ Mark for SELECT)<br/>(½ Mark of ROUND())</i>                                                                                                                                                          |   |
|          | <b>OR</b>                                                                                                                                                                                                   |   |
| (b)      | Explain the following SQL functions using suitable examples :                                                                                                                                               | 5 |
| (i)      | <b>LTRIM()</b>                                                                                                                                                                                              |   |
| Ans(i)   | <b>LTRIM()</b> function is used to remove any leading spaces (whitespace characters) from a string.<br><b>Example:</b><br><b>SELECT LTRIM(' HELLO') ;</b><br><br><b>Output:</b><br><b>HELLO</b>             |   |
|          | <i>(1 Mark for correctly explaining the function through example)<br/>OR<br/>(½ Mark for only explanation without any example)<br/>Note:<br/>No Marks to be deducted if only correct example is written</i> |   |
| (ii)     | <b>RTRIM()</b>                                                                                                                                                                                              |   |
| Ans(ii)  | <b>RTRIM()</b> function is used to remove any trailing spaces (whitespace characters) from a string.<br><br><b>Example:</b><br><b>SELECT RTRIM('HELLO ') ;</b><br><br><b>Output:</b><br><b>HELLO</b>        |   |
|          | <i>(1 Mark for correctly explaining the function through example)<br/>OR<br/>(½ Mark for only explanation without any example)<br/>Note:<br/>No Marks to be deducted if only correct example is written</i> |   |
| (iii)    | <b>INSTR()</b>                                                                                                                                                                                              |   |
| Ans(iii) | The <b>INSTR()</b> function is used to find the starting position of a substring within a larger string.<br><b>Example:</b><br><b>SELECT INSTR("SCIENCE","IE") ;</b><br><b>Output:</b><br><b>3</b>          |   |

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|         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |   |
|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
|         | <p><i>(1 Mark for correctly explaining the function through example)</i><br/> <b>OR</b><br/> <i>(½ Mark for only explanation without any example)</i><br/> <b>Note:</b><br/> <i>No Marks to be deducted if only correct example is written</i></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |   |
| (iv)    | <b>MOD ( )</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |   |
| Ans(iv) | <p><b>MOD ( )</b> function is used to calculate the remainder of a division operation between two numbers.<br/> <b>Example:</b></p> <pre>SELECT MOD (10,4) ;</pre> <p><b>Output:</b><br/>2</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |   |
|         | <p><i>(1 Mark for correctly explaining the function through example)</i><br/> <b>OR</b><br/> <i>(½ Mark for only explanation without any example)</i><br/> <b>Note:</b><br/> <i>No Marks to be deducted if only correct example is written</i></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |   |
| (v)     | <b>TRIM ( )</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |   |
| Ans(v)  | <p><b>TRIM ( )</b> function is used to remove leading and trailing spaces (whitespace characters) from a string.<br/> <b>Example:</b></p> <pre>SELECT TRIM('    HELLO    ');</pre> <p><b>Output:</b><br/>HELLO</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |   |
|         | <p><i>(1 Mark for correctly explaining the function through example)</i><br/> <b>OR</b><br/> <i>(½ Mark for only explanation without any example)</i><br/> <b>Note:</b><br/> <i>No Marks to be deducted if only correct example is written</i></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |   |
| 32.     | <p>AWESOME Private Ltd, Dehradun is a company that deals with hardware components. They have different divisions HR (A1), Sales (A2), Production (A3) and Marketing (A4). The layout of the Dehradun branch is :</p> <div style="border: 1px solid black; padding: 10px; display: inline-block;"> <p><b>DEHRADUN BRANCH</b></p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  </div> <div style="text-align: center;">  </div> </div> </div> <p>The company also has a branch in Mumbai. The management wants to connect all the divisions as well as the computers of each division (A1, A2, A3, A4).</p> | 5 |

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Distance between the wings are as follows :

|                                       |         |
|---------------------------------------|---------|
| A3 to A1                              | 32m     |
| A1 to A2                              | 53m     |
| A2 to A4                              | 29m     |
| A4 to A3                              | 110m    |
| A3 to A2                              | 750m    |
| A1 to A4                              | 200m    |
| Dehradun Head Office to Mumbai Office | 1656 KM |

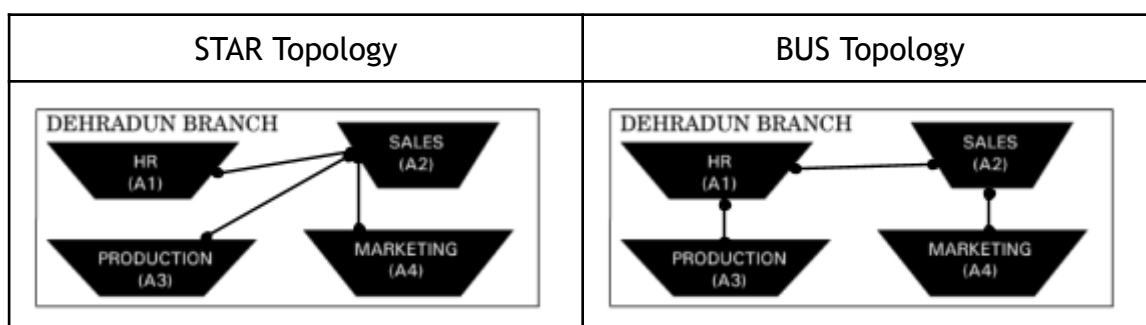
Number of computers in each wing :

|    |     |
|----|-----|
| A1 | 70  |
| A2 | 140 |
| A3 | 55  |
| A4 | 70  |

Based on the above specifications, answer the following questions :

- (a) Suggest the topology and draw the most efficient cable layout for connecting all the divisions of the Dehradun branch.

Ans (a)



*(½ Mark for suggesting the correct topology )*  
*(½ Mark for drawing the cable layout according to the suggested topology)*

- (b) Suggest the kind of network required (out of LAN, MAN, WAN) for connecting Production (A3) with Sales (A2).

Ans(b) LAN

*(1 Mark for suggesting the correct kind of network)*

- (c) Suggest the placement of the server. Explain the reasons for your selection.

Ans(c) Placement : SALES (A2)  
 It has maximum number of computers.

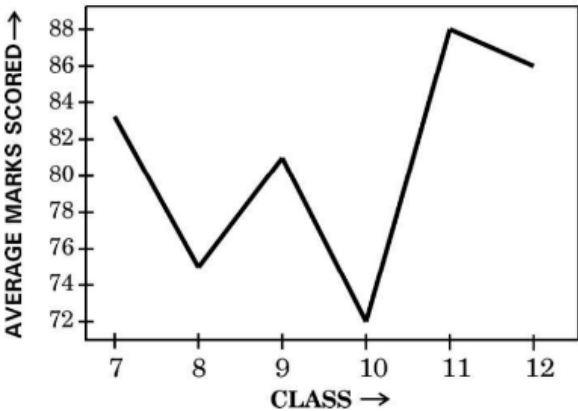
*(½ Mark for suggesting the correct placement)*  
*(½ Mark for explaining correct reason )*

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| (d)        | Suggest the placement of the Switch/Hub with justification.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |       |       |   |    |   |    |   |    |    |    |    |    |    |    |   |
|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|---|----|---|----|---|----|----|----|----|----|----|----|---|
| Ans(d)     | One switch/hub in each division.<br>A switch/hub will be placed in each division to interconnect devices present in that division.                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |       |       |   |    |   |    |   |    |    |    |    |    |    |    |   |
|            | <i>(½ Mark for suggesting the correct placement)</i><br><i>(½ Mark for justification )</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |       |       |   |    |   |    |   |    |    |    |    |    |    |    |   |
| (e)        | The company wants to do a collaborative project where the employees of Dehradun and Mumbai would collaborate and do the project. Therefore, the HR planned a series of webinars that employees could attend from their devices being online. Suggest the protocol that helped to send the voice signals over the Internet.<br>Also, give an example of a video conferencing software that helps to connect all the employees.                                                                                                                                                                                  |       |       |   |    |   |    |   |    |    |    |    |    |    |    |   |
| Ans (e)    | Protocol: VoIP or Voice over Internet protocol<br>Example of video conferencing software: Google Meet, Zoom, Webex, MS Teams, Whereby (Any One)<br>(or any other correct video conferencing software name)                                                                                                                                                                                                                                                                                                                                                                                                     |       |       |   |    |   |    |   |    |    |    |    |    |    |    |   |
|            | <i>(½ Mark for suggesting the correct protocol)</i><br><i>(½ Mark for explaining correct example of software name)</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |       |       |   |    |   |    |   |    |    |    |    |    |    |    |   |
| 33.<br>(a) | <p>Consider the following graph. Write the Python code to plot it. Also add the Title and Label for X and Y axis.<br/>Use the following data to draw the graph.</p> <table><thead><tr><th>Class</th><th>Marks</th></tr></thead><tbody><tr><td>7</td><td>83</td></tr><tr><td>8</td><td>75</td></tr><tr><td>9</td><td>81</td></tr><tr><td>10</td><td>72</td></tr><tr><td>11</td><td>88</td></tr><tr><td>12</td><td>86</td></tr></tbody></table> <p style="text-align: center;"><b>AVERAGE RESULT OF CLASSES VII-XII</b></p>  | Class | Marks | 7 | 83 | 8 | 75 | 9 | 81 | 10 | 72 | 11 | 88 | 12 | 86 | 5 |
| Class      | Marks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |       |       |   |    |   |    |   |    |    |    |    |    |    |    |   |
| 7          | 83                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |       |       |   |    |   |    |   |    |    |    |    |    |    |    |   |
| 8          | 75                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |       |       |   |    |   |    |   |    |    |    |    |    |    |    |   |
| 9          | 81                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |       |       |   |    |   |    |   |    |    |    |    |    |    |    |   |
| 10         | 72                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |       |       |   |    |   |    |   |    |    |    |    |    |    |    |   |
| 11         | 88                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |       |       |   |    |   |    |   |    |    |    |    |    |    |    |   |
| 12         | 86                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |       |       |   |    |   |    |   |    |    |    |    |    |    |    |   |



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Ans 33

(a)

```
import matplotlib.pyplot as plt
cl = [7,8,9,10,11,12]
avmarks=[83,75,81,72,88,86]
plt.plot(cl,avmarks)
plt.title("AVERAGE RESULT OF CLASS VII-XII")
plt.xlabel('CLASS')
plt.ylabel('AVERAGE MARKS SCORED')
plt.show()
```

*(1 Mark for correct import statement)*

*(1 Mark for correct use of plot())*

*(1 Mark for correct use of title())*

*(½ Mark for correct use of xlabel())*

*(½ Mark for correct use of ylabel())*

*(1 Mark for correct use of show())*

**Note:**

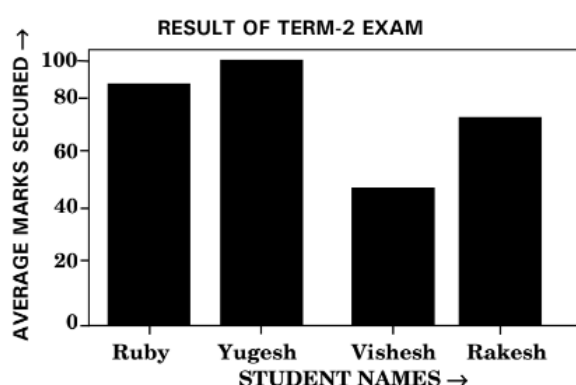
*Arrow symbols for X and Y axis to be ignored*

**OR**

(b)

Write a Python code to draw the following bar graph representing the average marks secured by each student in Term - 2 Exam. Add the Title and Label for X-axis and Y-axis. Use the following data to draw the graph:

| Names   | Average Marks |
|---------|---------------|
| Ruby    | 84            |
| Yugesh  | 92            |
| Vishesh | 45            |
| Rakesh  | 72            |



Ans (b)

```
import matplotlib.pyplot as plt
names = ['ruby', 'yugesh', 'Vishesh', 'Rakesh']
averagemarks=[84,92,45,72]
plt.bar(names,averagemarks)
plt.title("RESULT OF TERM-2 EXAM")
plt.xlabel('STUDENT NAMES')
plt.ylabel('AVERAGE MARKS SCORED')
plt.show()
```

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|         | <p>(1 Mark for import statement)</p> <p>(1 Mark for correct use of bar())</p> <p>(1 Mark for correct use of title())</p> <p>(½ Mark for correct use of xlabel())</p> <p>(½ Mark for correct use of ylabel())</p> <p>(1 Mark for correct use of show())</p> <p><b>Note:</b></p> <p>Arrow symbols for X and Y axis to be ignored</p>                                                                                                                                                                                                                                                                 |       |          |       |          |       |      |      |    |    |    |      |       |    |    |    |      |      |    |    |    |      |       |    |    |    |      |       |    |    |    |  |
|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|----------|-------|----------|-------|------|------|----|----|----|------|-------|----|----|----|------|------|----|----|----|------|-------|----|----|----|------|-------|----|----|----|--|
|         | Section E                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |       |          |       |          |       |      |      |    |    |    |      |       |    |    |    |      |      |    |    |    |      |       |    |    |    |      |       |    |    |    |  |
| 34.     | <p>Consider the following table Student :</p> <p style="text-align: center;">Table: STUDENT</p> <table><tr><th>Admn</th><th>Name</th><th>Class</th><th>Optional</th><th>Marks</th></tr><tr><td>1001</td><td>Tony</td><td>10</td><td>AI</td><td>90</td></tr><tr><td>1002</td><td>Ivana</td><td>11</td><td>IP</td><td>95</td></tr><tr><td>1003</td><td>Nick</td><td>10</td><td>IT</td><td>85</td></tr><tr><td>1004</td><td>Sandy</td><td>11</td><td>IP</td><td>80</td></tr><tr><td>1005</td><td>Kavya</td><td>11</td><td>IP</td><td>92</td></tr></table> <p>Write SQL queries for the following:</p> | Admn  | Name     | Class | Optional | Marks | 1001 | Tony | 10 | AI | 90 | 1002 | Ivana | 11 | IP | 95 | 1003 | Nick | 10 | IT | 85 | 1004 | Sandy | 11 | IP | 80 | 1005 | Kavya | 11 | IP | 92 |  |
| Admn    | Name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Class | Optional | Marks |          |       |      |      |    |    |    |      |       |    |    |    |      |      |    |    |    |      |       |    |    |    |      |       |    |    |    |  |
| 1001    | Tony                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 10    | AI       | 90    |          |       |      |      |    |    |    |      |       |    |    |    |      |      |    |    |    |      |       |    |    |    |      |       |    |    |    |  |
| 1002    | Ivana                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 11    | IP       | 95    |          |       |      |      |    |    |    |      |       |    |    |    |      |      |    |    |    |      |       |    |    |    |      |       |    |    |    |  |
| 1003    | Nick                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 10    | IT       | 85    |          |       |      |      |    |    |    |      |       |    |    |    |      |      |    |    |    |      |       |    |    |    |      |       |    |    |    |  |
| 1004    | Sandy                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 11    | IP       | 80    |          |       |      |      |    |    |    |      |       |    |    |    |      |      |    |    |    |      |       |    |    |    |      |       |    |    |    |  |
| 1005    | Kavya                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 11    | IP       | 92    |          |       |      |      |    |    |    |      |       |    |    |    |      |      |    |    |    |      |       |    |    |    |      |       |    |    |    |  |
| (a)     | Display the Total Marks secured by students of each class.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 1     |          |       |          |       |      |      |    |    |    |      |       |    |    |    |      |      |    |    |    |      |       |    |    |    |      |       |    |    |    |  |
| Ans(a)  | <pre>SELECT Class, SUM(Marks) FROM STUDENT GROUP BY Class;  OR  SELECT Class, SUM(Marks) "Total Marks" FROM STUDENT GROUP BY Class;  OR  SELECT SUM(Marks) FROM STUDENT GROUP BY Class;</pre>                                                                                                                                                                                                                                                                                                                                                                                                      |       |          |       |          |       |      |      |    |    |    |      |       |    |    |    |      |      |    |    |    |      |       |    |    |    |      |       |    |    |    |  |
|         | <p>(½ Mark for SELECT SUM(Marks))</p> <p>(½ Mark for FROM STUDENT GROUP BY Class)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |       |          |       |          |       |      |      |    |    |    |      |       |    |    |    |      |      |    |    |    |      |       |    |    |    |      |       |    |    |    |  |
| (b)     | Display the Average Marks secured by the students of IP optional subject                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1     |          |       |          |       |      |      |    |    |    |      |       |    |    |    |      |      |    |    |    |      |       |    |    |    |      |       |    |    |    |  |
| Ans (b) | <pre>SELECT AVG(Marks) FROM STUDENT WHERE Optional="IP";</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |       |          |       |          |       |      |      |    |    |    |      |       |    |    |    |      |      |    |    |    |      |       |    |    |    |      |       |    |    |    |  |
|         | <p>(½ Mark for SELECT AVG(Marks) FROM STUDENT )</p> <p>(½ Mark for WHERE Optional="IP" )</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |       |          |       |          |       |      |      |    |    |    |      |       |    |    |    |      |      |    |    |    |      |       |    |    |    |      |       |    |    |    |  |
| (c)     | Display the total number of students in each Class where the number of students are more than 2.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 2     |          |       |          |       |      |      |    |    |    |      |       |    |    |    |      |      |    |    |    |      |       |    |    |    |      |       |    |    |    |  |
| Ans (c) | <pre>SELECT Class, COUNT(*) FROM STUDENT GROUP BY Class HAVING COUNT(*)&gt;2;  OR  SELECT COUNT(*) FROM STUDENT GROUP BY Class HAVING COUNT(*)&gt;2;</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                         |       |          |       |          |       |      |      |    |    |    |      |       |    |    |    |      |      |    |    |    |      |       |    |    |    |      |       |    |    |    |  |

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|         | (1 Mark for writing <code>SELECT COUNT(*) FROM STUDENT</code> )<br>(1 Mark for writing <code>GROUP BY Class HAVING COUNT(*)&gt;2</code> )                                                                                                                                                                                                                                                                                                                                         |            |        |            |        |   |      |    |       |   |     |     |       |   |         |    |       |   |        |     |       |   |       |       |       |  |
|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|--------|------------|--------|---|------|----|-------|---|-----|-----|-------|---|---------|----|-------|---|--------|-----|-------|---|-------|-------|-------|--|
|         | OR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |        |            |        |   |      |    |       |   |     |     |       |   |         |    |       |   |        |     |       |   |       |       |       |  |
| (c)     | Display the maximum and minimum marks secured in each optional subject.                                                                                                                                                                                                                                                                                                                                                                                                           | 2          |        |            |        |   |      |    |       |   |     |     |       |   |         |    |       |   |        |     |       |   |       |       |       |  |
| Ans (c) | <code>SELECT Optional, MAX(Marks), MIN(Marks) FROM STUDENT<br/>GROUP BY Optional;</code><br><br>OR<br><br><code>SELECT MAX(Marks), MIN(Marks) FROM STUDENT<br/>GROUP BY Optional;</code>                                                                                                                                                                                                                                                                                          |            |        |            |        |   |      |    |       |   |     |     |       |   |         |    |       |   |        |     |       |   |       |       |       |  |
|         | (1 Mark for writing <code>SELECT MAX(Marks), MIN(Marks) FROM STUDENT</code> )<br>(1 Mark for writing <code>GROUP BY Optional</code> )                                                                                                                                                                                                                                                                                                                                             |            |        |            |        |   |      |    |       |   |     |     |       |   |         |    |       |   |        |     |       |   |       |       |       |  |
| 35.     | Consider the following DataFrame 'employee': <table border="1"><thead><tr><th>EID</th><th>EName</th><th>Department</th><th>Salary</th></tr></thead><tbody><tr><td>1</td><td>John</td><td>IT</td><td>50000</td></tr><tr><td>2</td><td>Ria</td><td>MKT</td><td>45000</td></tr><tr><td>3</td><td>Shibhit</td><td>IT</td><td>55000</td></tr><tr><td>4</td><td>Aditya</td><td>MKT</td><td>60000</td></tr><tr><td>5</td><td>Rashi</td><td>ADMIN</td><td>52000</td></tr></tbody></table> | EID        | EName  | Department | Salary | 1 | John | IT | 50000 | 2 | Ria | MKT | 45000 | 3 | Shibhit | IT | 55000 | 4 | Aditya | MKT | 60000 | 5 | Rashi | ADMIN | 52000 |  |
| EID     | EName                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Department | Salary |            |        |   |      |    |       |   |     |     |       |   |         |    |       |   |        |     |       |   |       |       |       |  |
| 1       | John                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | IT         | 50000  |            |        |   |      |    |       |   |     |     |       |   |         |    |       |   |        |     |       |   |       |       |       |  |
| 2       | Ria                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | MKT        | 45000  |            |        |   |      |    |       |   |     |     |       |   |         |    |       |   |        |     |       |   |       |       |       |  |
| 3       | Shibhit                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | IT         | 55000  |            |        |   |      |    |       |   |     |     |       |   |         |    |       |   |        |     |       |   |       |       |       |  |
| 4       | Aditya                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | MKT        | 60000  |            |        |   |      |    |       |   |     |     |       |   |         |    |       |   |        |     |       |   |       |       |       |  |
| 5       | Rashi                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | ADMIN      | 52000  |            |        |   |      |    |       |   |     |     |       |   |         |    |       |   |        |     |       |   |       |       |       |  |
| (a)     | Write Python statements for the DataFrame 'employee':                                                                                                                                                                                                                                                                                                                                                                                                                             |            |        |            |        |   |      |    |       |   |     |     |       |   |         |    |       |   |        |     |       |   |       |       |       |  |
| (i)     | To remove the column 'Salary'.                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 1          |        |            |        |   |      |    |       |   |     |     |       |   |         |    |       |   |        |     |       |   |       |       |       |  |
| Ans(i)  | <code>employee=employee.drop('Salary', axis=1)</code><br>OR<br><code>employee.drop('Salary', axis=1, inplace=True)</code>                                                                                                                                                                                                                                                                                                                                                         |            |        |            |        |   |      |    |       |   |     |     |       |   |         |    |       |   |        |     |       |   |       |       |       |  |
|         | (1 Mark for writing the correct Python statement)                                                                                                                                                                                                                                                                                                                                                                                                                                 |            |        |            |        |   |      |    |       |   |     |     |       |   |         |    |       |   |        |     |       |   |       |       |       |  |
| (ii)    | To remove the row having index 4.                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 1          |        |            |        |   |      |    |       |   |     |     |       |   |         |    |       |   |        |     |       |   |       |       |       |  |
| Ans(ii) | <code>employee=employee.drop(employee.index[4])</code><br>OR<br><code>employee.drop(employee.index[4], inplace=True)</code>                                                                                                                                                                                                                                                                                                                                                       |            |        |            |        |   |      |    |       |   |     |     |       |   |         |    |       |   |        |     |       |   |       |       |       |  |
|         | (1 Mark for writing the correct Python statement)                                                                                                                                                                                                                                                                                                                                                                                                                                 |            |        |            |        |   |      |    |       |   |     |     |       |   |         |    |       |   |        |     |       |   |       |       |       |  |
| (b)     | Write Python statement to save the DataFrame 'employee' to a CSV file data.csv stored in D: drive of the computer                                                                                                                                                                                                                                                                                                                                                                 | 2          |        |            |        |   |      |    |       |   |     |     |       |   |         |    |       |   |        |     |       |   |       |       |       |  |
| Ans (b) | <code>employee.to_csv('d:\\data.csv')</code><br>OR<br><code>employee.to_csv('d:/data.csv')</code>                                                                                                                                                                                                                                                                                                                                                                                 |            |        |            |        |   |      |    |       |   |     |     |       |   |         |    |       |   |        |     |       |   |       |       |       |  |

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|         |                                                                                                                                                                    |   |
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|         | <i>(1 Mark for writing <code>employee.to_csv</code>)</i><br><i>(1 Mark for writing the correct path)</i>                                                           |   |
|         | OR                                                                                                                                                                 |   |
| (b)     | Write a Python statement to display the new salary i.e., salary increased by 5000 for all employees.                                                               | 2 |
| Ans (b) | <code>employee['new_salary'] = employee['salary'] + 5000</code><br><code>print(employee['new_salary'])</code><br>OR<br><code>print(employee['salary']+5000)</code> |   |
|         | <i>(1½ Marks for increasing salary by 5000)</i><br><i>(½ Mark for writing <code>print()</code>)</i>                                                                |   |