SOLVED

Sample Question Paper-2

Time Allowed: 3 hours **Maximum Marks: 70**

General Instructions:

(i) Please check this question paper contains 37 questions.

(ii) All questions are compulsory. However, internal choices have been provided in some questions. Attempt only one of the choices in such questions.

(iii) The paper is divided into 5 Sections — A, B, C, D and E.

(iv) Section A consists of 21 questions (1 to 21). Each question carries 1 Mark.

(v) Section B consists of 7 questions (22 to 28). Each question carries 2 Marks.

(vi) Section C consists of 4 questions (29 to 32). Each question carries 3 Marks.

(vii) Section D consists of 2 case study type questions (33 to 34). Each question carries 4 Marks.

(viii) Section E consists of 3 questions (35 to 37). Each question carries 5 Marks.

(ix) All programming questions are to be answered using Python Language only.

(x) In case of MCQ, text of the correct answer should also be written.

SECTION-A

Question 1 to 16 are multiple choice questions. Only one of the choices is correct. Select and write the correct choice as well as the answer to these questions.

1. State whether the following statement is True or False:

The axis=1 argument in the drop() method is used to drop columns in a DataFrame. **[M] [1]**

2. What will be the output of the following SQL query?

SELECT ROUND(12.789, 1); **[M] [1]**

(a) 12.7 **(b)** 12.8 **(c)** 12.78 **(d)** 13.0

3. An online attacker accessed the files on Neha's computer without her permission by exploiting a network vulnerability. This act is known as: **[E] [1]**

(a) Cyber Bullying **(b)** Hacking **(c)** Plagiarism **(d)** Phishing

4. Which function is used to display the first 5 rows of a Pandas DataFrame by default? **[E] [1]**

(a) df.tail() **(b)** df.show() **(c)** df.head() **(d)** df.top()

5. Which device is used to connect different networks and route data between them? **[E] [1]**

(a) Switch **(b)** Router **(c)** Hub **(d)** Repeater

6. Which SQL function is used to return a number rounded to the nearest integer value (either higher or lower depending on the decimal part)? **[M] [1]**

(a) ROUND() **(b)** FLOOR() **(c)** CEIL() **(d)** TRUNC()

7. Priya created a logo for her handmade soap business. What type of IPR protects her logo from being copied? **[H] [1]**

(a) Patent **(b)** Copyright **(c)** Trademark **(d)** Design

8. Which of the following can be used as data when creating a Pandas Series? **[M] [1]**

(a) List **(b)** Dictionary **(c)** Numpy array **(d)** All of the above

9. Which of the following keys uniquely identifies each record in a table? **[E] [1]**

(a) Foreign key **(b)** Alternate key **(c)** Primary key **(d)** Composite key

10. Which of the following technologies allows users to store, access, and manage data online instead of on a local device? **[M] [1]**

(a) VoIP **(b)** Cloud Computing **(c)** Circuit Switching **(d)** Bluetooth

11. Which function is used to calculate the total sum of values in a numeric column? **[E] [1]**

(a) MAX() **(b)** SUM() **(c)** COUNT() **(d)** TOTAL()

12. What will be the result of adding a scalar value to a Pandas Series? **[H] [1]**

(a) The scalar is added only to the first element **(b)** The scalar is added only to the last element
(c) The scalar is added to all elements **(d)** Error occurs

13. Which of the following is not considered a cybercrime under the IT Act, 2000? **[E] [1]**

(a) Data theft **(b)** Cyberstalking **(c)** Physical assault **(d)** Phishing

14. What is the default sorting order when using the ORDER BY clause in SQL? **[M] [1]**

(a) Descending **(b)** Alphabetical **(c)** Random **(d)** Ascending

15. Which method is used to access rows by their integer position rather than labels? **[M] [1]**

(a) df.loc[] **(b)** df.iloc[] **(c)** df.index() **(d)** df.select()

16. Which network topology requires the maximum number of cables and network interfaces? **[M][1]**

(a) Star **(b)** Mesh **(c)** Ring **(d)** Bus

17. Which SQL function is used to convert all characters in a string to lowercase? **[M][1]**

(a) LOWER() **(b)** LWCASE() **(c)** TO_LOWER() **(d)** downcase()

18. Which of the following statements is used to view the first 5 rows of a DataFrame named *df*? **[E][1]**

(a) df.head() **(b)** df.top() **(c)** df.first(5) **(d)** df.peek()

19. What does the COUNT(*) function return? **[E][1]**

(a) Number of columns in the table **(b)** Number of rows in the table
(c) Number of NULL values **(d)** Number of primary keys

20. **Assertion (A):** The df.head() function in Pandas returns the last 5 rows of a DataFrame.

Reason (R): The head() method is used to view the initial rows of a DataFrame. **[E][1]**

(a) Both A and R are True, and R correctly explains A.
(b) Both A and R are True, but R does not correctly explain A.
(c) A is True, but R is False.
(d) A is False, but R is True.

21. **Assertion (A):** The GROUP BY clause in SQL is used with aggregate functions to group the result-set by one or more columns.

Reason (R): Aggregate functions like COUNT(), AVG(), and MAX() operate only on grouped data. **[D] [1]**

(a) Both A and R are True, and R correctly explains A.
(b) Both A and R are True, but R does not correctly explain A.
(c) A is True, but R is False.
(d) A is False, but R is True.

SECTION-B

22. **(a)** Highlight any two key differences between a Series and a DataFrame in Python's Pandas library. **[E] [2]**

OR

(b) Given the Series name as S_marks **[E M]**

Student	Marks
Raj	88
Simran	45
Ali	67
Maya	91

(i) Display marks of students who scored above 70. **[H]**
(ii) Set the Series name to "Exam Scores". [E]

23. Ravi, an IT professional working in a finance company, accessed confidential customer records without permission and shared the data with a third-party vendor in exchange for money. His employer discovered the breach during an audit.

(i) Which cyber law is violated in this scenario?
(ii) Suggest any two preventive measures an organiszation can implement to avoid such misuse. **[H] [2]**

24. Assume the string "Class 12 IP Practical". Write SQL **queries** to:

(i) Display the position of the word 'IP' in the string.

(ii) Count the total number of characters (including spaces). [M] [2]

25. **(a)** What is the difference between Static static and dynamic webpage? [E] [2]

OR

(b) Difference between WWW and Internet. [E] [2]

26. What are aggregate functions in SQL? Name any two. [E] [2]

27. Explain Plagiarism with an example. [E] [2]

28. **(a)** Riya is learning how to use Pandas and is trying to create a Series of integers. She writes the following code, but it does not work as expected. Help her by rewriting the corrected version and underline the parts where she made mistakes.

```
import Pandas
val = [10, 20, 30]
s = pd.Series(val, index = ['a', 'b' 'c'])
print(S)
```

[M] [2]

OR

(b) Complete the Python code to display the following output using a DataFrame:

	ITEM	PRICE
0	Pen	10
1	Pencil	5
2	Eraser	7

```
import  as pd
data = [{'ITEM':'Pen','PRICE':10},
        {'ITEM':'Pencil','PRICE':5},
        {_______}]
df = pd.DataFrame(_______)
print(_______)
```

[E] [2]

SECTION-C

29. Ritika is a Class 12 student who actively participates in online webinars, shares academic content on social media, and subscribes to several educational platforms. One day, she receives a suspicious email asking for her login credentials. She also realiszes that her personal details are visible on multiple public forums without her knowledge. Ritika becomes worried about how her data is being collected and used. Help Ritika by answering the following questions:

(i) What do you understand by digital privacy? Why is it important?

(ii) Suggest any two precautions Ritika should take while sharing personal data online.

(iii) What should Ritika do if she receives a suspicious or phishing email? [M] [3]

30. **(a)** Write a Python program to create a Series as shown below using a dictionary. Note that left column indicates the indices and the right column displays the data.

Fiction	F
Non Fiction	NF
Drama	D
Poetry	P

[E] [3]

OR

(b) Write a Python program to generate the following DataFrame using a Dictionary of Series:

	Brand	Type
0	Nike	Shoes
1	Samsung	Phone
2	Dell	Laptop
3	Titan	Watch

[E] [3]

31. (i) Write the SQL statement to create a table, Employee, with the following specifications:

Column Name	Data Type	Key

EID	Int	Primary Key
EName	Varchar (40)	
Department	Varchar (30)	
Salary	**Int**	

(ii) Write the SQL query to display the EName and Salary of all employees working in the 'IT' department, in descending order of Salary. [E] [3]

32. Given the following tables:

Table: BOOKS

BOOK_ID	TITLE	AUTHOR_ID	PRICE
1	The Great Novel	1	25.00
2	Coding Basics	2	30.00
3	Mystery Solved	1	22.50
4	Data Structures	3	35.00
5	Epic Journey	2	28.00

Table: AUTHORS

AUTHOR_ID	AUTHOR_NAME	COUNTRY
1	A.B. Writer	USA
2	C.D. Coder	India
3	E.F. Expert	UK

Write SQL queries for the following:

(i) To display the number of books written by each author.

(ii) To find the average price of all books.

(iii) To list the titles of books and the names of their respective authors. [M] [3]

SECTION-D

33. Ravi wants to create a line plot to represent the sales (in thousands) for five months. The table below shows the data:

Month	Sales (in '000)
January	15
February	18
March	21
April	19
May	22

He writes the following Python program but misses a few statements. Fill in the blanks to complete it:

```
import _____ as plt  # Statement-1
months = ['Jan', 'Feb', 'Mar', 'Apr', 'May']
sales = [15, 18, 21, 19, 22]
plt.____(months, sales)  # Statement-2
plt.xlabel('_______')  # Statement-3
plt.ylabel('Sales (in 000)')
plt.title('_______')  # Statement-4
plt.show()
```

Write the missing statements according to the given specifications:

(i) Write the suitable code to import the required module in the blank space in the line marked as Statement-1.

(ii) Fill in the blank in Statement-2 with a suitable Python function name to create a line plot.

(iii) Refer to the graph shown and fill in the blank in Statement-3 to display the appropriate label for the x-axis.

(iv) Refer to the graph shown and fill in the blank in Statement-4 to display the suitable chart title. [E] [4]

34. **(a) An online store maintains a database of products. The database includes a table PRODUCTS with the following attributes:**

- **P_ID**: Stores the unique product ID.
- **P_NAME**: Stores the name of the product.
- **CATEGORY**: Stores the category of the product.
- **PRICE**: Stores the price of the product.

Table: PRODUCTS

P_ID	P_NAME	CATEGORY	PRICE
P101	Headphones	Electronics	1500
P102	Running Shoes	Footwear	2500
P103	Backpack	Accessories	1200
P104	LED Bulb	Electronics	500
P105	T-shirt	Clothing	800

Write *SQL* queries for the following:

(i) Add a new product with:
- P_ID: P106
- P_NAME: Smart Watch
- CATEGORY: Electronics
- PRICE: 3500

(ii) Display all products in the "Electronics" category.

(iii) Find the total number of products in the "Footwear" category.

(iv) Display all product names in uppercase. **[M] [4]**

OR

(b) An institution maintains a table named STUDENT for student records with the following structure:
- **SID:** Unique student ID
- **S_NAME:** Name of the student
- **CLASS:** Class enrolled in
- **FEES:** Annual fees
- **ADM_DATE:** Date of admission

Table: STUDENT

SID	S_NAME	CLASS	FEES	ADM_DATE
S01	RIA MEHRA	12-COM	42000	2020-06-15
S02	ADITYA RAO	11-SCI	45000	2021-08-10
S03	NISHA JAIN	12-ARTS	40000	2022-04-20
S04	VIKAS SINGH	11-COM	43000	2021-06-05
S05	ALI KHAN	12-SCI	47000	2019-07-25

Write the output of the following SQL queries:

(i) SELECT UPPER(S_NAME) FROM STUDENT WHERE CLASS = '12-COM';

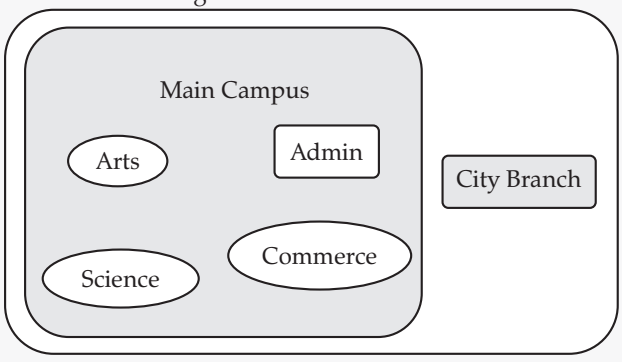
(ii) SELECT S_NAME FROM STUDENT WHERE MONTH(ADM_DATE) = 6;

(iii) SELECT S_NAME FROM STUDENT WHERE FEES > 43000;

(iv) SELECT COUNT(CLASS) FROM STUDENT; **[M] [4]**

SECTION-E

35. "Great Achievers College" has its main campus in a suburban area and its branch is situated in the township. The buildings at these places are shown in the diagram.



Distance between the blocks are given below:

Admin to science	85 m
Admin to commerce	120 m
Admin to Arts	75 m
Science to commerce	80 m
Science to Arts	70 m
Commerce to Arts	60 m
township to main campus	6 kg

Numbers of Computers in the blocks given are as

Admin	100
Science	80
Commerce	50
Arts	20
City branch	60

(i) Name the device that will be to protect the network from unwanted and unauthorised accesses from outside the network.
(ii) Which Topology is suggested in your layout scheme for the main campus?
(iii) Which block will be appropriate for the server in teh main campus, and given reason.
(iv) Suggest most reliable and low-maintenance connection for the campus with its city branch in the township.
(v) Suggest the placement of the following devices with justification if the company wants to minimised network traffic.
- Repeater
- Hub/Switch

[M] [5]

36. Consider the following DataFrame **Student.**

	RollNo	Name	Class	Marks
0	201	Ria Mehra	12A	88
1	202	Aditya Rao	12B	92
2	203	Nisha Jain	12A	79
3	204	Vikas Shah	12C	85
4	205	Ali Khan	12B	90

Write suitable Python statements for the following:
(i) To display the first three rows of the DataFrame **Student**.
(ii) To display the values under the **Name** column.
(iii) To add a new column, **Grade**, with the value 'A' for all students.
(iv) To display rows with index 1 and 4.
(v) To remove the column **Class.**

[H] [5]

37. (a) Write SQL queries for the following based on the table *EMPLOYEES*:
(i) To find the average salary from the SALARY column.
(ii) To display the first 4 letters of the EMP_NAME column.
(iii) To display the EMP_NAME values after converting them to lowercase.
(iv) To retrieve the maximum salary from the SALARY column.
(v) To increase the BONUS column value by 500 for all employees. [H] [5]

OR

(b) Write SQL queries for the following:
(i) To find the cube of 8.
(ii) To extract the month from the date '2025-02-15'.
(iii) To find the length of the string 'Digital Learning'.
(iv) To extract the year from '2023-12-10'.
(v) To display the current system date.

[H] [5]

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