



	<p>column AadharID also contains unique values and can be used to identify a record. What is AadharID an example of?</p> <p>(A) Alternate Key (B) Composite Key (C) Foreign Key (D) Candidate Key</p>	
10.	<p>Which of the following is a key component required for an Internet connection using a telephone line?</p> <p>(A) DNS Server (B) Modem (C) Ethernet Cable (D) Firewall</p>	1
11.	<p>Which of the following SQL functions is used to display the current date and time?</p> <p>(A) DATE() (B) CURRENT_DATE() (C) NOW_DATE() (D) NOW()</p>	1
12.	<p>What is the output of the following Pandas Series operation, where</p> <p><b>s = pd.Series([10, 20, 30])</b> <b>print(s * 2)</b></p> <p>(A) 10 20 30 (B) 20 40 60 (C) 10 20 30 10 20 30 (D) An Error occurs</p>	1
13.	<p>The practice of sending unsolicited bulk messages to a large number of recipients is known as:</p> <p>(A) Malware (B) Spamming (C) Adware (D) Identity Theft</p>	1
14.	<p>Which SQL command is used to retrieve data from one or more tables?</p> <p>(A) UPDATE (B) INSERT INTO (C) SELECT (D) CREATE TABLE</p>	1
15.	<p>Which of the following Python commands selects all rows and the columns from index position 0 up to (but not including) 2 of a DataFrame df?</p> <p>(A) df.iloc[:, 0:2] (B) df.loc[:, 0:2] (C) df.iloc[:2] (D) df.iloc[0:2]</p>	1
16.	<p>In a network where all devices are connected to a central hub or switch, what is this topology called?</p> <p>(A) Bus Topology (B) Mesh Topology (C) Ring Topology (D) Star Topology</p>	1
17.	<p>What is the use of the UCASE() function in SQL?</p> <p>(A) To convert the first letter of a string to uppercase.</p>	1

	(B) To check if a string is already in uppercase. (C) To convert all characters in a string to uppercase. (D) To extract the uppercase characters from a string.	
18.	Which of the following methods is used to get a count of non-null values in each column of a Pandas DataFrame? (A) df.size (B) df.count() (C) df.info() (D) df.value_counts()	1
19.	Which of the following is an example of an open-source software license? (A) Proprietary License (B) Shareware License (C) GNU GPL (General Public License) (D) Commercial License	1
<p><b>Q 20 and 21 are ASSERTION AND REASONING based questions. Mark the correct choice as</b></p> <p><b>A. Both A and R are true and R is the correct explanation for A</b></p> <p><b>B. Both A and R are true and R is not the correct explanation for A</b></p> <p><b>C. A is True but R is False</b></p> <p><b>D. A is false but R is True</b></p>		
20.	<b>Assertion (A):</b> DataFrame is a two-dimensional labelled array. Its columns types can be heterogeneous i.e., of varying types. <b>Reason (R):</b> We need a DataFrame with a Boolean index to use the Boolean indexing.	1
21.	<b>Assertion (A):</b> In SQL, INSERT INTO is a Data Definition Language (DDL) command. <b>Reason (R):</b> DDL commands are used to create, modify, or remove database structures, such as tables.	1
<b>Section-B (7X2 = 14 Marks)</b>		
22.	A) Define Data Visualization. Mention any one type of plot that can be created using the Matplotlib library.  <b>OR</b>  (B) List any two differences between Series and DataFrame in Pandas.	2
23.	Define digital footprints. Differentiate between active and passive digital footprints.	2
24.	Riya wants to create a Pandas Series to store the quarterly sales data. Help her in completing the code below to achieve the desired output:  Q1 15000 Q2 18000	2

	<pre> Q3 12000 Q4 20000 import _____ _____ = [15000, 18000, 12000, 20000] quarters = ['Q1', 'Q2', 'Q3', 'Q4'] s = PA._____ (sales, index=_____) print(s) </pre>	
25.	<p>(A) Explain the concept of World Wide Web (WWW). Name two protocols commonly used for transferring data on the WWW.</p> <p style="text-align: center;"><b>OR</b></p> <p>(B) What is the full form of URL? Name its two essential components.</p>	2
26.	<p>Write SQL queries to perform the following:</p> <p>I. Find and display the rightmost 4 characters of the string <b>"INFORMATION TECHNOLOGY"</b>.</p> <p>II. Display the length of the string <b>"Cyber Security"</b>.</p>	2
27.	<p>Define e-waste. Mention two ways in which e-waste can be managed responsibly.</p>	2
28.	<p>(A) Write the output of the following code:</p> <pre> import pandas as pd data = {'A': [1, 2, 3], 'B': [4, 5, 6]} df = pd.DataFrame(data) df['C'] = df['A'] + df['B'] print(df) </pre> <p style="text-align: center;"><b>OR</b></p> <p>(B) Write the output of the following code:</p> <pre> import pandas as pd s = pd.Series([100, 200, 300, 400], index=['a', 'b', 'c', 'd']) print(s.head(2)) </pre>	2
<b>Section-C (4X3 = 12 Marks)</b>		
29.	<p>Reena, a fashion designer, has created a unique pattern for a new line of clothing. She</p>	3

	<p>wants to protect her creative work from being copied.</p> <p>I. Explain the terms Intellectual Property and Patent to Reena.</p> <p>II. Under which specific category of IPR is her unique pattern likely to be covered?</p> <p>III. What do you mean by copyright infringement?</p>																					
30.	<p>(A) Write a Python program to create the Pandas DataFrame displayed below using a dictionary of lists.</p> <table border="1"> <tr> <td colspan="4">DataFrame:</td> </tr> <tr> <td></td> <td>ID</td> <td>Name</td> <td>Salary</td> </tr> <tr> <td>0</td> <td>101</td> <td>Ankit</td> <td>55000</td> </tr> <tr> <td>1</td> <td>102</td> <td>Neha</td> <td>62000</td> </tr> <tr> <td>2</td> <td>103</td> <td>Ravi</td> <td>48000</td> </tr> </table> <p style="text-align: center;"><b>OR</b></p> <p>(B) Write a Python program to create a Pandas Series named S1 containing the first 5 even numbers (starting from 2) and print its values that are greater than 6.</p>	DataFrame:					ID	Name	Salary	0	101	Ankit	55000	1	102	Neha	62000	2	103	Ravi	48000	3
DataFrame:																						
	ID	Name	Salary																			
0	101	Ankit	55000																			
1	102	Neha	62000																			
2	103	Ravi	48000																			
31.	<p>i. Write an SQL statement to create a table named STUDENTS, with the following specifications:</p> <table border="1"> <tr> <td colspan="2"><b>Table: STUDENTS</b></td> </tr> <tr> <td>Column Name</td> <td>Data Type</td> </tr> <tr> <td>Stu_ID</td> <td>Numeric</td> </tr> <tr> <td>Stu_Name</td> <td>Varchar(30)</td> </tr> <tr> <td>City</td> <td>Varchar(20)</td> </tr> <tr> <td>DOB</td> <td>Date</td> </tr> </table> <p>ii. Write an SQL Query to insert the following data into the STUDENTS table:</p> <p><b>105, 'Simran', 'Delhi', '2007-08-15'</b></p>	<b>Table: STUDENTS</b>		Column Name	Data Type	Stu_ID	Numeric	Stu_Name	Varchar(30)	City	Varchar(20)	DOB	Date	3								
<b>Table: STUDENTS</b>																						
Column Name	Data Type																					
Stu_ID	Numeric																					
Stu_Name	Varchar(30)																					
City	Varchar(20)																					
DOB	Date																					
32.	<p>Consider the following table PRODUCTS:</p> <table border="1"> <tr> <td colspan="4"><b>Table: PRODUCTS</b></td> </tr> <tr> <td>ProductID</td> <td>ProductName</td> <td>Category</td> <td>Price</td> </tr> </table>	<b>Table: PRODUCTS</b>				ProductID	ProductName	Category	Price	3												
<b>Table: PRODUCTS</b>																						
ProductID	ProductName	Category	Price																			

P001	Laptop	Electronics	75000
P002	T-Shirt	Clothing	1250
P003	Mouse	Electronics	800
P004	Jeans	Clothing	2450
P005	Keyboard	Electronics	850

Write appropriate SQL queries for the following:

- I. Display the average price of products in each Category.
- II. Display the ProductName where the Price is between 1000 and 5000, sorted by ProductName in descending order.
- III. Display the ProductName and the first 3 characters of the Category.

**OR**

Carefully observe the following table named 'STOCK':

Pid	PName	Category	Qty	Price
1	Keyboard	IO	15	450
2	Mouse	IO	10	350
3	Wifi-router	NW	5	2600
4	Switch	NW	3	3000
5	Monitor	O	10	4500
6	Printer	O	4	17000

- I. Which attribute in the Table can be considered as the Primary Key? Provide justification for your answer
- II. Write a suitable SQL query to add a new column, Discount%, of numeric data type to the table.
- III. Write the output of the following SQL Query.

**SELECT Category, sum(Price) FROM STOCK GROUP BY Category;**

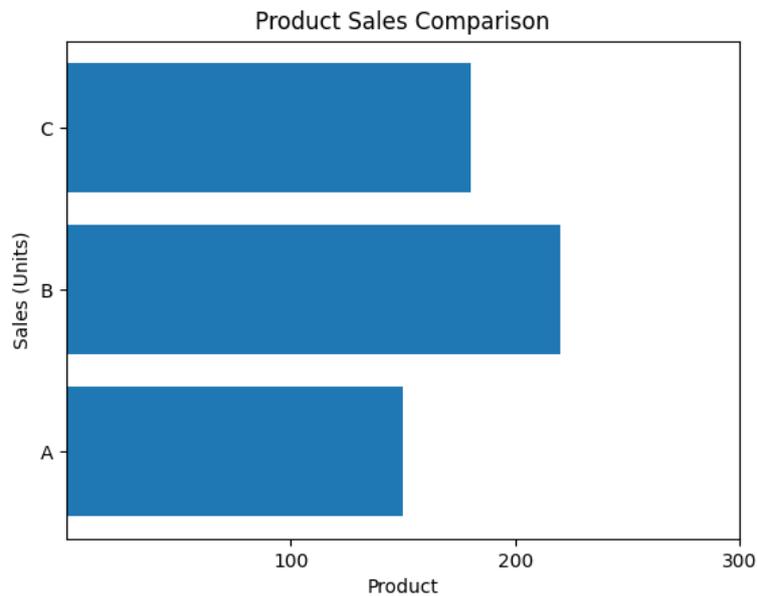
**Section-D (2X4 = 8 Marks)**

33. Sarika, a data analyst, is working on a Python program to create the bar chart representing the sales figures of three different products. The data is given below. Help Sarika by filling in the blanks in the following Python program.

Product Sales Data:	
Product	Sales (Units)
A	150

4

B	220
C	180



```
import matplotlib.pyplot as _____ # Statement-1
```

```
products = ['A', 'B', 'C']
```

```
sales = [150, 220, 180]
```

```
plt._____ (products, sales) # Statement-2
```

```
plt.xlabel('Product')
```

```
plt.ylabel('Sales (Units)')
```

```
plt.title('Product Sales Comparison')
```

```
plt.yticks(_____) # Statement-3
```

```
_____ # Statement-4
```

```
plt.show()
```

I. Write the suitable code for the import statement in the blank space in the line marked as Statement-1.

II. Write the suitable code for the blank space in the line marked as Statement-2, which plots the bar chart.

III. Fill in the blank in Statement-3 with the correct Python code to set the label of the y-axis tick corresponding to the Product to get the desired output.

IV. If Sarika wants to save the bar chart as product.jpg, which function should should

be written in Statement 4?

34. (A) Raghav is maintaining a table named STUDENT\_GRADES:

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<b>Table: STUDENT_GRADES</b>			
RollNo	Name	DOT	Grade
101	Alisha	2025/10/20	A
102	Bhuvan	2025/10/23	B
103	Chetan	2025/11/05	A
104	Divya	2025/11/10	A

Write suitable SQL queries for the following.

- I. Display the RollNo and Name of students whose Grade is 'A'.
- II. Display the name of the student and the day name of the week for their Date\_of\_Test.
- III. Show the Name with all characters in lowercase and the length of the Name.
- IV. Display number of different grades secured by the students.

**OR**

(B) Consider the following table EMPLOYEE\_DATA:

<b>Table: EMPLOYEE_DATA</b>			
EmpID	EmpName	Dept	Salary
101	Riya	Sales	25000
102	Kunal	Marketing	30000
103	Riya	Sales	NULL
104	Meera	Marketing	33000

Write the output of the following SQL Queries.

- I. SELECT DISTINCT EmpName FROM EMPLOYEE\_DATA;
- II. SELECT Dept, count(Salary) FROM EMPLOYEE\_DATA GROUP BY Dept;
- III. SELECT EmpName, ROUND(Salary/10000, 1) FROM EMPLOYEE\_DATA WHERE Dept = 'Marketing';
- IV. SELECT MID(EmpName, 2, 3) FROM EMPLOYEE\_DATA WHERE EmpID=104;

**Section-E (3X5 = 15 Marks)**

35. Cyber Secure Pvt. Ltd. is setting up its new office in a two-block complex, Block A and

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Block B. The blocks are 150 meters apart. The total number of computers in Block A is 100 and in Block B is 40. The distance between the different wings within Block A are as follows:

Admin Wing to HR Wing	50 m
Admin Wing to Development Wing	120 m
HR Wing to Development Wing	30 m

The number of computers in each wing of Block A is:

Admin	40
HR	20
Development	40

- I. Suggest the most appropriate network type (LAN, MAN, WAN) to connect Block A and Block B. Justify your answer.
- II. Draw a suitable wired cable layout for the three wings within Block A to minimize cable length.
- III. Which hardware device will you suggest to connect the two different Blocks?
- IV. Which type of unguided media would you suggest for high-speed connectivity between the two blocks if there is a clear Line of Sight?
- V. The company plans to develop an interactive website that will enable its employees to monitor their performance after login. Would you recommend a static or dynamic website, and why?

36. Consider the DataFrame **df\_products** shown below. (Assume pd is an alias for pandas).

	Item_Code	Product_Name	Price
0	101	Mouse	850.0
1	102	Keyboard	1200.0
2	103	Monitor	8500.0
3	104	Webcam	1500.0

**Write Python statements for the following tasks:**

- I. Display the Product\_Name of the row with the integer index 2 using integer-based indexing.

	<p>II. Add a new column named "Quantity" with values [50, 40, 25, 30].</p> <p>III. Delete the row with the index label 0.</p> <p>IV. Display the Product_Name and Price columns for all products costing more than 1000.0.</p> <p>V. Display the dimensions (number of rows and columns) of the DataFrame.</p>	
37.	<p>(A) Write suitable SQL queries for the following:</p> <p>I. To extract 4 characters from the string 'Information' starting from the 3rd position.</p> <p>II. To display the total number of employees from the EmployeeID column in the Employees table.</p> <p>III. To display the year part of the column DateOfJoining from the Employees table.</p> <p>IV. To display the Address column from the Customers table after removing any spaces from the beginning of the string.</p> <p>V. To calculate the remainder of 10 divided by 3.</p> <p style="text-align: center;"><b>OR</b></p> <p>(B) Write suitable SQL queries for the following:</p> <p>I. To find the average of the Marks column in the Students table, rounded to the nearest integer.</p> <p>II. To round the argument x that contains number 234.6789 to 3 decimal places.</p> <p>III. To find the position of the first occurrence of the substring 'ing' in the string 'Programming'.</p> <p>IV. To display the name of the month of the current date.</p> <p>V. To display the distinct values of the Category column from the Products table.</p>	5