

Sample Question Paper-8

SECTION-A

1. True

Explanation: head(n) returns the first n rows of a DataFrame. If n is not specified, it defaults to 5

2. (b) 4

Explanation: The MOD function returns the remainder of division. Dividing 14 by 5 gives a remainder of 4.

3. (b) Phishing

Explanation: This is a case of Phishing, where attackers impersonate legitimate entities to steal sensitive information.

4. (b) pd.read_csv()

Explanation: pd.read_csv() is the correct function to load a CSV file into a Pandas DataFrame.

5. (b) Repeater

Explanation: A Repeater is used to regenerate and amplify signals to extend the range of a network.

6. (a) Rounds to two decimal places

Explanation: The ROUND() function rounds a number to the specified number of decimal places. ROUND(3.14159, 2) results in 3.14.

7. (a) Patent

Explanation: A Patent protects inventions and technical innovations, such as a new engine design.

8. (b) One-dimensional labelled array

Explanation: A Series is a one-dimensional labelled array capable of holding any data type, similar to a single column in a DataFrame.

9. (c) 3

Explanation: Candidate keys are attributes that can uniquely identify a record. EmpID, SSN, and Email are all unique identifiers, hence 3 candidate keys.

10. (c) WhatsApp Voice Call

Explanation: WhatsApp Voice Call uses VoIP (Voice over Internet Protocol), which transmits voice data over the internet.

11. (b) COUNT(column_name)

Explanation: COUNT(column_name) counts only the non-NULL entries in the specified column

12. (c) Returns a Series with the union of indices and NaN where labels don't match

Explanation: When two Series with different indices are multiplied, Pandas aligns them by index. Non-matching indices result in NaN.

13. (c) Information Technology (Amendment) Act, 2008

Explanation: The Information Technology (Amendment) Act, 2008 introduced provisions for cyber terrorism, data protection, and stronger penalties.

14. (b) GROUP BY

Explanation: GROUP BY is used to group rows that have the same values in specified columns, often used with aggregate functions

15. (b) df.loc[:2]

Explanation: df.loc[:2] selects rows with index labels 0, 1, and 2, effectively retrieving the first three rows

16. (b) Star

Explanation: In Star topology, all nodes are connected to a central device like a hub or switch, which manages communication.

17. (b) Convert all characters in a string to uppercase

Explanation: The UPPER() function converts all characters in a string to uppercase.

18. (b) pandas.DataFrame()

Explanation: pandas.DataFrame() creates an empty DataFrame with no rows and no columns.

19. (c) SUBSTRING()

Explanation: SUBSTRING() is a scalar function used to extract part of a string. It is not an aggregate function like COUNT() or AVG().

20. (a) Both A and R are true and R correctly explains A.

Explanation: Both the assertion and reason are true. df.head(0) returns an empty DataFrame with only column headers, which matches the explanation.

21. (d) A is False, but R is True.

Explanation: The assertion is false because most SQL dialects do allow changing column data types using ALTER TABLE. The reason is true.

SECTION-B

22. (a) A DataFrame is a two-dimensional, tabular data structure with labelled axes (rows and columns). One property of a DataFrame is shape which returns a tuple indicating the number of rows and columns (e.g., (n_rows, n_cols)).

OR

(b) Differences between Series and DataFrame in Pandas:

(1) A Series is one-dimensional, while a DataFrame is two-dimensional (rows and columns).

(2) Both are mutable, but in Series only values can be changed, while in DataFrame both values and structure (rows/columns) can be changed.

23. E-waste (electronic waste) comprises discarded electrical or electronic devices.

Leaching of heavy metals (like lead and cadmium) from improperly dumped e-waste contaminates soil, reducing fertility and harming plant life.

24. import pandas as pd

```
ser_data = {'Apple': 3.0, 'Banana': 1.2, 'Cherry': 5.0}
prices = pd.Series(ser_data)
print(prices)
```

25. (a) A web server is software (and the hardware it runs on) that listens for HTTP requests and delivers the website's files (HTML, CSS, images) back to users' browsers.

Web hosting is the service of renting space on such a server—connected round the clock to the Internet—so Rohan's code and assets remain stored, maintained and accessible via his domain.

OR

(b) VoIP allows voice communication over the internet.

Benefit: cost-effective

26. (i) SELECT DAYNAME('2026-07-04');

(ii) SELECT LENGTH('Incredible India');

27. Copyright is a legal right that protects original creative works such as books, music, films, and software, giving the creator exclusive control over how their work is used and shared.

Difference from a patent:

Copyright safeguards artistic and literary expression, while a patent protects inventions and technical processes, granting exclusive rights to the inventor for a limited period.

25. (a)

	Item	Cost
0	Apple	3.5
1	Banana	1.2
2	Cherry	5.0

OR

	Country	Capital
0	USA	Washington
2	Mexico	Mexico City

SECTION-C

29. (i) IP denotes creative outputs; IPR is the bundle of exclusive rights (patents, trademarks, etc.) granted by law to exploit IP.

(ii) Her purifier is a patentable subject matter under patent law.

(iii) Enforcing IPR maintains market exclusivity, rewards innovation and encourages ongoing tech advancement.

30. (a)

```
import numpy as np
import pandas as pd
marks = np.array([75, 82, 79, 88])
subjects = ['Physics', 'Chemistry', 'Biology', 'Mathematics']
s = pd.Series(marks, index=subjects)
```

OR

(b) import pandas as pd

```
data = [
    {'Name': 'Alice', 'Age': 30},
    {'Name': 'Bob', 'Age': 25},
    {'Name': 'Charlie', 'Age': 28}
]
df = pd.DataFrame(data)
print(df)
```

31. (i) CREATE TABLE TEACHERS (
TeacherID INTEGER PRIMARY KEY,
Name VARCHAR(40),
Subject VARCHAR(30),
JoinDate DATE

(ii) INSERT INTO TEACHERS (TeacherID, Name, Subject, JoinDate)
VALUES (1001, 'Sandeep Roy', 'Mathematics', '2018-07-01');

32. (a) (i) SELECT Name FROM STUDENT WHERE
Class = 9 ORDER BY

Name DESC;

(ii) SELECT LCASE(Subject) FROM MARKS
WHERE Score > 75;

(iii) SELECT STUDENT.StudentID, MARKS.
Subject, MARKS.Score FROM STUDENT
JOIN MARKS
ON STUDENT.StudentID = MARKS.
StudentID;

OR

(b) (i) EmployeeID can be considered as Primary Key because it uniquely identifies each employee in the table.

(ii) ALTER TABLE Employee ADD Experience
INT;

(iii)

Department	COUNT(*)
IT	2
Marketing	2
Finance	1

SECTION-D

34. (i) `import matplotlib.pyplot`
 (ii) `plt.plot(Days, Temperature, label='Temperature')`
 (iii) `plt.title('Weekly Temperature Trend')`
 (iv) `plt.savefig('weekly_temperature.png')`
34. (a) (i) `SELECT UPPER(Name), UPPER(City)`
`FROM Employee ORDER BY`
`Name;`
 (ii) `SELECT EmpID, MONTHNAME(Join_`
`Date) AS Join_Month`
`FROM Employee;`
 (iii) `SELECT AVG(Salary) AS Average_Salary`
`FROM Employee;`
 (iv) `SELECT City, COUNT(*) AS Employee_`
`Count`
`FROM Employee GROUP BY City;`

OR

(b) (i)

Name	LENGTH(Name)
Raj	3
Tanya	5

(ii)

lower(Name)
Sneha

(iii)

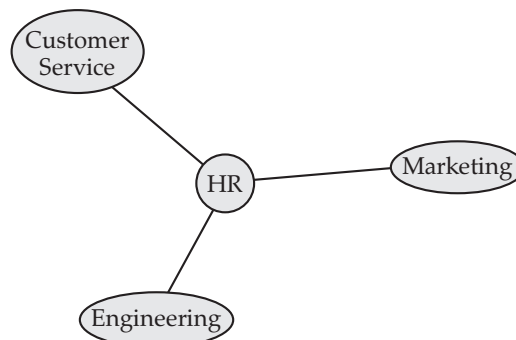
AVG (Salary)
62000

(iv)

Name	Salary
Raj	60000
Tanya	62000
Sneha	61000

SECTION-E

35. (i) Server should be placed in HR department as it has maximum number of systems which will keep most of the traffic local to server.



- (ii) Star Topology
 (iii) Switch/Hub
 (iv) WAN(Wide Area Network), as the offices are located in different cities.
 (v) Repeater
36. (i) Last three rows
`df_students.tail(3)`
 (ii) Add Credits column
`df_students['Credits'] = [120, 110,`
`130, 100, 125]`
 (iii) Delete GPA column
`df_students.drop('GPA', axis=1,`
`inplace=True)`
 (iv) Rename Major to Field
`df_students.rename(columns =`
`{ 'Major': 'Field'}, inplace=True)`
 (v) Display Name and Credits
`df_students[['Name', 'Credits']]`
37. (a) (i) `SELECT RIGHT(employee_id, 4) FROM`
`Employees;`
 (ii) `SELECT COUNT(Customer_ID) FROM`
`Customers;`
 (iii) `SELECT MONTH(hire_date) FROM`
`Employees;`
 (iv) `SELECT TRIM(City') FROM Addresses;`
 (v) `SELECT SYSDATE();`

OR

- (b) (i) `SELECT LENGTH('InformationTechnolo`
`gy');`
 (ii) `SELECT INSTR(Course_Name, 'e') FROM`
`Courses;`
 (iii) `SELECT POWER(Score, 3) FROM Results;`
 (iv) `SELECT MAX(Marks) FROM Students;`
 (v) `SELECT MIN(Salary) FROM Staff;`

□□□