



**MARKING SCHEME - SAMPLE PAPER – 3**

Code: Learnpython4cbse-3/5(25CBSE03)

**INFORMATICS PRACTICES 12TH (CODE 065)****General Instructions:****Time: 3 Hrs.****Max. Marks: 70**

1. Please check this question paper contains 37 questions.
2. All questions are compulsory. However, internal choices have been provided in some questions. Attempt only one of the choices in such questions.
3. The paper is divided into 5 Sections- A, B, C, D and E.
4. Section A consists of 21 questions (1 to 21). Each question carries 1 Mark.
5. Section B consists of 7 questions (22 to 28). Each question carries 2 Marks.
6. Section C consists of 4 questions (29 to 32). Each question carries 3 Marks.
7. Section D consists of 2 case study type questions (33 to 34). Each question carries 4 Marks.
8. Section E consists of 3 questions (35 to 37). Each question carries 5 Marks.
9. All programming questions are to be answered using Python Language only.
10. In case of MCO, text of the correct answer should also be written.

**SECTION A [21x1=21]****1. State whether the following statement is True or False:**

The loc function in pandas is used to access rows by their integer position.

**Answer:** False.

The loc function in pandas is used to access rows by label (index name), not by integer position. To access rows by integer position, iloc is used.

**2. Which SQL command clause helps to arrange records in ascending or descending order?**

**Answer:** (b) Order by

**3. This topology provides easier detection of errors:**

**Answer:** (d) Mesh

In a mesh topology, each device is connected to every other device, providing more redundancy and easier error detection.

**4. Which of the following function returns an integer that indicates the position of the first occurrence of the sub-string within the string?**

**Answer:** (a) INSTR()

5. Which of the following is/are the benefit(s) of e-Waste management?

**Answer:** (d) All of these

E-waste management saves the environment, creates jobs, and allows for the recovery of precious metals.

6. While accessing the column from the dataframe, we can specify the column name. In case the column does not exist, which type of error will it raise?

**Answer:** (a) Key error

If the column name does not exist, pandas raises a `KeyError`.

7. What is the purpose of the `subplot()` function in Matplotlib?

**Answer:** (a) Create multiple plots in one figure

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

The SQL UPDATE statement can be used to modify existing records in a table.

**Answer:** True

9. Which function will be used to read data from a CSV file onto a Pandas dataframe?

**Answer:** (c) `read_csv()`

10. The Indian IT act was framed in the year:

**Answer:** (a) 2000

11. Fill in the blank:

The SQL command used to remove a table from the database is \_\_\_\_\_

**Answer:** (c) DROP

12. What kind of transmission medium is most appropriate to carry data in a computer network that is exposed to electrical interferences?

**Answer:** (b) Optical fiber

Optical fiber is immune to electrical interference.

13. Function to display the first n rows in the DataFrame is

**Answer:** (b) `head()`

14. What is a common health concern associated with prolonged use of digital devices such as smartphones and computers?

**Answer:** (c) Eye strain and vision problems

15. Which function is used to sort the series values using values?

**Answer:** (c) `sort_values()`

16. Match the following SQL functions/clauses with their descriptions:

SQL Function	Description
P. MAX()	2. Returns the maximum value in a column.
Q. AVG()	4. Returns the average value in a column.
R. INSTR()	3. Find the position of a substring in a string.
S. DISTINCT	1. Removes duplicate rows from the result set.

**Answer:** (a) P-2, Q-4, R-3, S-1

**17. Fill in the blank:**

The \_\_\_\_\_ method is used to concatenate two DataFrames along a specific axis.

**Answer:** (c) concat()

**18. When using the `plt.subplots()` function, which parameter allows you to specify the size of the figure in inches?**

**Answer:** (a) figsize

**19. Identify the device which connects dissimilar networks?**

**Answer:** (d) Both (a) and (b)

A router and gateway both can connect dissimilar networks.

**20. Assertion (A) and Reason (R) Type questions:**

**Assertion (A):** Two series can be added in pandas, if the indexes are the same.

**Reason (R):** Indexes in pandas series can be changed by the index property.

**Answer:** (a) Both Assertion (A) and Reason (R) are true, and Reason (R) is the correct explanation of Assertion (A).

**21. Assertion (A) and Reason (R) Type questions:**

**Assertion (A):** The GRANT command in SQL is used to provide users with privileges to perform actions on the database.

**Reason (R):** The 'GRANT' command is a Data Manipulation Language (DML) Command.

**Answer:** (c) Assertion (A) is True, but Reason (R) is False.

GRANT is a Data Definition Language (DDL) command, not DML.

## SECTION B [7x2=14]

**22. What is the purpose of the `tail()` function in Pandas? Provide an example.**

**Answer:**

The `tail()` function returns the last `n` rows from a DataFrame or Series. By default, it returns the last 5 rows.

Example:

```
import pandas as pd
df = pd.DataFrame({'A': [1, 2, 3, 4, 5]})
print(df.tail(3)) # Outputs the last 3 rows
```

**OR**



**Explain the head() function in Pandas with an example.**

The head() function returns the first n rows from a DataFrame or Series. By default, it returns the first 5 rows.

Example:

```
import pandas as pd
df = pd.DataFrame({'A': [1, 2, 3, 4, 5]})
print(df.head(3)) # Outputs the first 3 rows
```

**23. What is phishing and how can it be avoided?**

**Answer:**

Phishing is a type of cyber attack where an attacker impersonates a legitimate organization to trick people into disclosing sensitive information, such as passwords or credit card numbers.

It can be avoided by:

- Avoiding clicking on suspicious links or attachments in emails.
- Verifying the authenticity of emails or messages by contacting the organization directly.
- Using two-factor authentication.

**24. Consider the string: "Entity Relationship Diagram". Write suitable SQL queries for the following:**

I. To extract and display "Entity" from the string.

```
SELECT SUBSTRING('Entity Relationship Diagram', 1, 6);
```

II. Display the position of the first occurrence of "Relationship" in the given string.

```
SELECT INSTR('Entity Relationship Diagram', 'Relationship');
```

**25. Aman, a freelance website developer, has been assigned a task to design web pages for a book shop. Help Aman in deciding which type of web page should be designed.**

**Answer:**

- **Static Web Pages:** These are fixed web pages with content that doesn't change unless manually updated. Suitable for displaying content that remains the same.
- **Dynamic Web Pages:** These are web pages that interact with the user and can change based on inputs or other conditions. These are more suitable for an e-commerce website like a book shop, where the content (products, prices) may change frequently.

**Conclusion:** Aman should design **dynamic web pages** for the book shop.

**OR**

### Difference between Website and Web Pages:

- **Website:** A collection of multiple related web pages that are linked together and can be accessed via a common domain.
- **Web Page:** A single document or page that is part of a website and can contain text, images, and links.

### 26. Write any two differences between Insert and Update commands of SQL.

**Answer:**

- **Insert Command:** Adds new records into a table. It is used when inserting new data.
- **Update Command:** Modifies existing records in a table. It is used when modifying data in existing records.

### 27. What is the importance of Net Etiquettes?

**Answer:**

Net Etiquette refers to proper online behavior, which is essential for maintaining respectful and productive communication in digital spaces. It includes respecting others' privacy, avoiding cyberbullying, and following acceptable behavior in online forums and social media.

### 28. Correct the given Python code:

```
import pandas as pd
data = {'Name': ['Riya', 'Preeti', 'Neeta'], 'Age': [25, 30, 22]}
df = pd.DataFrame(data)
df.to_csv('output.csv')
```

OR

### Complete the Python code:

```
import pandas as pd
df = pd.DataFrame({'name': ['Riya', 'Preeti', 'Neeta'], 'age': [25, 30, 22],
'score': [85, 78, 92]})
selected_rows = df[(df['score'] > 80) & (df['age'] < 30)]
print(selected_rows)
```

### SECTION C [3x4=12]

### 29. Saharsh is a student of Class IXth and he is a very frequent user of Internet applications. One day he got an unpleasant message on his instant messenger.

(i) What do you think he should do?



- Saharsh should immediately report the message to the relevant authorities (administrator, parent, etc.), avoid responding to the sender, and block the sender if possible.

(ii) **Exhibiting proper manners and etiquettes while being online is called as?**

- This is called **Netiquette**.

(iii) **Name the law to handle such issues?**

- The **Information Technology Act, 2000** addresses issues related to cybercrime and online harassment in India.

30. **Ritika is a new learner for Python Pandas and she is aware of some concepts of Python but is unable to create the DataFrame. Help her by writing proper statement.**

**Answer:**

```
import pandas as pd
data = {'Name': ['Manpreet', 'Kavil', 'Manu', 'Ria'], 'Phy': [70, 60, 76, 89],
        'Chem': [30, 70, 50, 65]}
df = pd.DataFrame(data)
print(df)
```

**OR**

```
import pandas as pd
data = {'Bridge': ['Dhola Sadiya Bridge', 'Dibang River Bridge', 'Mahatma
Gandhi Setu', 'Munger Ganga Bridge'],
        'State': ['Assam', 'Arunachal Pradesh', 'Bihar', 'Uttar Pradesh']}
df = pd.Series(data)
print(df)
```

31. **SQL statement to create a table named CUSTOMER:**

```
CREATE TABLE CUSTOMER (
CustomerID NUMERIC PRIMARY KEY,
FirstName VARCHAR(30),
LastName VARCHAR(30),
DOA DATE,
Email VARCHAR(50)
```





);

**SQL Query to insert data into the CUSTOMER table:**

```
INSERT INTO CUSTOMER (CustomerID, FirstName, LastName, DOA, Email)
VALUES (5678, 'John', 'Doe', '2022-01-20', 'john.doe@example.com');
```

**32. Consider the following tables and write SQL queries for the following:**

(i) Display the total order amount per country.

```
SELECT CustomerCountry, SUM(OrderAmount) AS TotalOrderAmount
FROM CUSTOMER JOIN ORDERS ON CUSTOMER.CustomerID = ORDERS.CustomerID
GROUP BY CustomerCountry;
```

(ii) List all customers who have placed orders in descending order of their total order amount.

```
SELECT CustomerName, SUM(OrderAmount) AS TotalOrderAmount
FROM CUSTOMER JOIN ORDERS ON CUSTOMER.CustomerID = ORDERS.CustomerID
GROUP BY CustomerName
ORDER BY TotalOrderAmount DESC;
```

(iii) Display customer names along with the order date and order amount for each order.

```
SELECT CustomerName, OrderDate, OrderAmount
FROM CUSTOMER JOIN ORDERS ON CUSTOMER.CustomerID = ORDERS.CustomerID;
```

**OR**

(i) Display the average age of students enrolled in course ID 101.

```
SELECT AVG(AGE) AS AvgAge
FROM STUDENT JOIN ENROLLMENT ON STUDENT.STUDENT_ID = ENROLLMENT.STUDENT_ID
WHERE COURSE_ID = 101;
```

(ii) List all courses in the decreasing order of the number of students enrolled.

```
SELECT COURSE_ID, COUNT(STUDENT_ID) AS NumStudents
FROM ENROLLMENT
```





```
GROUP BY COURSE_ID
ORDER BY NumStudents DESC;
```

(iii) Display the names of students along with their grades in course ID 102.

```
SELECT STUDENT_NAME, GRADE
FROM STUDENT JOIN ENROLLMENT ON STUDENT.STUDENT_ID = ENROLLMENT.STUDENT_ID
WHERE COURSE_ID = 102;
```

### SECTION D [2x4=8]

33. Help the student complete the Python code for generating a bar chart.

**Answer:**

```
import matplotlib.pyplot as plt # Statement-1
subjects = ['History', 'Geography', 'Economics', 'BST', 'IP']
pass_percentage = [75, 70, 80, 60, 55]
plt.bar(subjects, pass_percentage) # Statement-2
plt.title("Result Analysis") # Statement-3
plt.ylabel("Pass Percentage") # Statement-4
plt.show()
```

34. SQL Queries for the Worker Table:

**Answer:**

(i) Display the details of all workers in descending order of DOB.

```
SELECT * FROM Worker
ORDER BY DOB DESC;
```

(ii) Display Name and Desig of those workers, whose Plevel is either P001 or P002.

```
SELECT Name, Desig FROM Worker
WHERE Plevel IN ('P001', 'P002');
```

(iii) Display the details of all workers, whose DOB is between '19-JAN-1984' and '18-JAN-1987'.

```
SELECT * FROM Worker
WHERE DOB BETWEEN '1984-01-19' AND '1987-01-18';
```

(iv) To add a new row:

```
INSERT INTO Worker (Ecode, Name, Desig, Plevel, DOJ, DOB)
VALUES (19, 'Daya Kishore', 'Operator', 'P003', '2008-06-19', '1984-07-11');
```

**OR**

### SQL Queries for the Furniture Table:

(i) Show all information about the baby cots.

```
SELECT * FROM Furniture
WHERE Type = 'Baby Cot';
```

(ii) List Itemname which are priced at more than 15000.

```
SELECT Itemname FROM Furniture
WHERE Price > 15000;
```

(iii) List Itemname and Type where Dateofstock is before 22/01/02.

```
SELECT Itemname, Type FROM Furniture
WHERE Dateofstock < '2002-01-22'
ORDER BY Itemname DESC;
```

(iv) Display Itemname and Dateofstock of those items whose Type is "Sofa."

```
SELECT Itemname, Dateofstock FROM Furniture
WHERE Type = 'Sofa';
```

### SECTION E [3x5=15]

#### 35. JNV School Network Design:

**(i) The most suitable wing to install the server:**

The **Admin wing** would be most suitable as it is centrally located, ensuring better access to all wings and higher security.

**(ii) Cable Layout and Topology:**

The school should use a **Star Topology**, where all the wings are connected to a central server in the Admin wing.

**(iii) Device/Software for Data Security:**

A **Firewall** and **Antivirus Software** should be placed at the central server and individual computers.

**(iv) Device to Connect Computers in Each Wing:**

- **Switches** should be placed in each wing to connect computers.

**(b) Placement of a Repeater:**

A repeater should be placed in the **DORMITORY** to ensure a stable signal in the farthest wing.

**(v) Device and Protocol for Wireless Internet Access:**

A **Wi-Fi Router** using **802.11ac** protocol should be installed in the Admin wing to provide wireless internet to the campus.

**36. DataFrame Operations:**

```
import pandas as pd
stock = pd.DataFrame({
    'Name': ['Item1', 'Item2', 'Item3', 'Item4'],
    'Price': [150, 180, 225, 500]})
# (i) Add a column 'Special_Price'
stock['Special_Price'] = [135, 150, 200, 440]

# (ii) Add a new book
stock = stock.append({'Name': 'The Secret', 'Price': 800,
    'Special_Price': 800}, ignore_index=True)

# (iii) Remove the 'Special_Price' column
stock.drop(columns=['Special_Price'], inplace=True)
```



```
# (iv) Update the price of 'Item2'
stock.loc[stock['Name'] == 'Item2', 'Price'] = 190
```

```
# (v) Filter items with price > 200
filtered = stock[stock['Price'] > 200]
print(filtered)
```

### 37. SQL Queries:

#### Answer:

(i) Display the minimum value from the price column:

```
SELECT MIN(Price) FROM Products;
```

(ii) Display the first five characters of the phone\_number column:

```
SELECT LEFT(phone_number, 5) FROM Contacts;
```

(iii) Display the position of the first occurrence of "iya":

```
SELECT INSTR('Kendriya Vidyalaya', 'iya');
```

(iv) Display the column NAME in uppercase:

```
SELECT UPPER(NAME) FROM STUDENT;
```

(v) Compute the remainder of 120 and 7:

```
SELECT MOD(120, 7);
```