



Delhi Public School, Howrah

PERIODIC TEST – II (2025-2026)

CLASS – XII

Care must be taken not to write anything on the question paper. All the questions must be attempted in the correct sequence.

SUBJECT: INFORMATICS PRACTICES (065)

THEORY EXAMINATION

Time Allowed:- 3 Hours

F.M.-70

General Instructions:

- All questions are compulsory.
- The examination paper contains five sections, from Section A to Section E.
- Section A consists of 21 questions (1 to 21). Each question carries 1 Mark.
- Section B consists of 7 questions (22 to 28). Each question carries 2 Marks.
- Section C consists of 4 questions (29 to 32). Each question carries 3 Marks.
- Section D consists of 2 questions (33 to 34). Each question carries 4 Marks.
- Section E consists of 3 questions (35 to 37). Each question carries 5 Marks.
- There is no overall choice. However, internal choices have been provided in some questions. Attempt only one of the choices in such questions.
- All programming questions are to be answered using Python Language only.
- In case of MCQ, text of the correct answer should also be written.

SECTION – A (1X21 = 21 Marks)

1. Which Pandas function is used to view the first few rows of a Series or DataFrame?
(A) tail() (B) head() (C) slice() (D) first()
2. _____ data structure in Pandas is a type of one-dimensional labelled array.
(A) Series (B) DataFrame (C) Dictionary (D) List
3. Which of the following can be used to create a Pandas DataFrame?
(A) Dictionary of Series (B) List of dictionaries (C) CSV file (D) All of these
4. In Pandas, which indexing method allows selecting data based on conditional expressions?
(A) Label indexing (B) Boolean indexing (C) Position indexing (D) Conditional slicing
5. Which Matplotlib plot type is best for displaying data trends over time?
(A) Histogram (B) Bar graph (C) Line plot (D) Pie chart
6. The _____ Matplotlib function is used to add a title to a plot.
(A) plt.title() (B) plt.addtitle() (C) plt.heading() (D) plt.plot_title()
7. In SQL, which function is used to convert text to uppercase?
(A) LCASE() (B) LOWER() (C) CAPITALIZE() (D) UCASE()
8. Name the SQL function that returns the current date and time.
(A) DATE() (B) CURRENT() (C) NOW() (D) GETDATE()
9. Which SQL function returns only the month number from a date?
(A) MONTHNAME() (B) MONTH() (C) DAY() (D) YEAR()
10. What will the SQL function ROUND(123.456, 2) return?
(A) 123.46 (B) 123.45 (C) 124.00 (D) 123.50
11. Which SQL function is used to remove spaces from the right side of a string?
(A) LTRIM() (B) RTRIM() (C) TRIM() (D) RIGHT()
12. Which SQL aggregate function returns the highest value in a column?
(A) MIN() (B) AVG() (C) MAX() (D) SUM()
13. In SQL, COUNT(*) returns:
(A) The sum of all numeric values (B) The number of rows including NULLs
(C) The number of non-null rows (D) The average of numeric values

14. Which SQL clause is used to group rows that have the same values in specified columns?

- (A) ORDER BY (B) HAVING (C) SELECT (D) GROUP BY

15. Which SQL function extracts a substring from a string?

- (A) MID() (B) SUBSTRING() (C) Both A and B (D) EXTRACT()

16. The DAYNAME() function in SQL returns:

- (A) The month number in the calendar (B) The day name of the week
(C) The number of days in a month (D) The date and day together

17. Which of the following is NOT a mathematical SQL function?

- (A) POWER() (B) ROUND() (C) MOD() (D) LENGTH()

18. In Pandas, which method is used to select specific rows and columns using labels?

- (A) iloc[] (B) loc[] (C) select() (D) get()

19. In SQL, which function returns the total number of characters of a string?

- (A) LENGTH() (B) LEN() (C) SIZE() (D) STRLEN()

Q-20 and Q-21 are Assertion (A) and Reason (R) Type questions. Choose the correct option as:

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

(B) A is False, but R is True.

(C) Both A and R are True, and R is the correct explanation of A.

(D) Both A and R are True, but R is NOT the correct explanation of A.

20. **Assertion (A):** Boolean indexing in Pandas is used to filter data based on specific conditions.

Reason (R): It returns only those rows where the condition evaluates to True, making data selection faster and more readable.

21. **Assertion (A):** The HAVING clause is used with GROUP BY clause and aggregate functions.

Reason (R): HAVING clause specifies the condition on individual rows or records.

SECTION – B (2 X 7 = 14 Marks)

22. (i) What is the difference between a Pandas Series and a DataFrame?

2

OR

(ii) Which method is used to import a CSV file into a Pandas DataFrame? Write its syntax.

23. Riya plotted a line graph using Matplotlib to show the monthly sales of her shop. However, her teacher found the graph incomplete because it had no labels on the axes and no title. Why is it important for Riya to add labels and a title to her plot in Matplotlib? Explain.

2

24. Arjun is learning Python and wants to store marks of students using Pandas Series. His teacher told him that there are multiple ways to create a Series, such as using a list, dictionary, or NumPy array. Help Arjun by explaining any three different ways to create a Pandas Series with suitable examples.

2

25. (i) What is the purpose of LOWER() and UPPER() functions in SQL?

2

OR

(ii) What is an Equi-Join in SQL? Explain with an example.

26. Write SQL queries to perform the following actions:

2

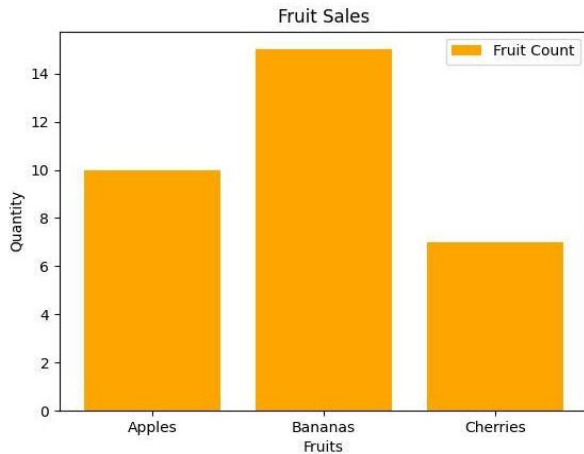
(i) Display the name of the day (e.g., Monday, Tuesday) for the date '2026-01-01'.

(ii) Find and display the position of the substring "India" in the string "Incredible India"

27. Afeefa wants to create the given Bar Graph using Matplotlib Python module for the following data:

Categories: ['Apples', 'Bananas', 'Cherries']

Quantities: [10, 15, 7]



She has written the following code which is incomplete.

```
import matplotlib.pyplot as plt
categories = ['Apples', 'Bananas', 'Cherries']
quantities = [10, 15, 7]

#Statement 1
#Statement 2

plt.title("Fruit Sales")

#Statement 3

plt.show()
```

Write Python statements to complete the following code and help Afeefa to plot the graph.

- #Statement 1 – to create the bar chart with the legend label as “Fruit Count”. 1
- #Statement 2 – to add label for the y-axis. 0.5
- #statement 3 – to display the legend on the plot. 0.5

28. (a) Predict the output of the following code:

```
import pandas as pd
data = {'Name': ['A', 'B', 'C'], 'Marks': [85, 42, 73]}
df = pd.DataFrame(data)
print(df[df['Marks'] > 50])
```

2

OR

```
(b) import pandas as pd
s1 = pd.Series([5, 10, 15])
s2 = pd.Series([1, 2, 3])
print(s1 + s2)
print(s1 * 2)
```

SECTION – C (3 X 4 = 12 Marks)

29. You are given a dictionary of student marks and a Pandas Series has been created from it.

```
student_marks = {'Alice': 85, 'Bob': 78, 'Charlie': 92, 'David': 74}
marks_series = pd.Series(student_marks)
```

Write Python statement to perform the following on the above Series.:

- Display the last two elements. 1
- Increase all marks by 5. 1
- Select and display the marks of a specific student. 1

30. (a) Consider a DataFrame Emp_df of employee data created out of the given dictionary.

```
Emp_data = {'Name': ['Alex', 'Brian', 'Cathy', 'Diana'], 'Age': [25, 30, 27, 35],
            'Salary': [50000, 65000, 72000, 58000]}
```

Perform the following operations on the DataFrame named Emp_df:

- Filter employees who earn more than 60,000. 1
- Add a new column called Tax which is 10% of the Salary and print the DataFrame. 2

OR

(b) Write a Python script to create a histogram for the following dataset:

[5, 7, 8, 5, 6, 8, 7, 6, 7, 9, 10, 10, 9, 8, 9, 10]

Use 5 bins, set the color to "green", and add labels for both axes and a title "Score Distribution".

3

31. A company maintains its employee records in the following **EMPLOYEE** table:

3

EmpID	Name	Dept	Salary	JoiningDate
101	Raj	HR	40000	2022-06-01
102	Priya	IT	60000	2021-08-15
103	Aman	IT	65000	2023-01-12
104	Sunita	Finance	50000	2022-05-10
105	Ramesh	HR	42000	2021-09-18
106	Meena	IT	70000	2023-02-20

The HR manager wants to analyze the workforce distribution across departments.

Write SQL queries to help the manager perform the following tasks:

- Find the count of employees in each department.
- Show only those departments where more than 2 employees are working.
- Display departments in ascending order of the number of employees.

32. (a) A company maintains its sales records in the following table named "SALES":

3

SaleID	Product	Quantity	Price	Region
1	Laptop	5	55000	North
2	Mouse	50	500	South
3	Keyboard	20	1500	East
4	Monitor	10	12000	North
5	Printer	8	8000	West
6	Mouse	30	500	North
7	Laptop	3	55000	East

The sales manager wants to analyze the company's sales performance across different regions and products. Help the sales manager by writing SQL queries for the following:

- Count number of sales transactions per region.
- Show only regions having more than 1 transaction.
- List product-wise total quantity sold, in descending order of quantity.

OR

(b) A school library maintains a Books table to keep track of its collection:

BookID	Title	Author	Genre	Copies
1	DBMS Concepts	Navathe	Education	4
2	SQL Mastery	Allen	Education	3
3	Adventure Tales	Sam	Fiction	7
4	Mystery Night	John	Fiction	5
5	AI Revolution	Kate	Technology	6
6	Python for All	Mike	Technology	8

The librarian wants to analyze the distribution of books across genres for better management. Help the librarian by writing SQL queries for the following tasks:

- Count the number of books in each genre.
- Show only genres having total copies more than 10.
- Display genres in alphabetical order.

SECTION – D (4 X 2 = 8 Marks)

33. You are given a CSV file "students.csv" with columns Name, Math, Science. Do the following:

- Import the CSV into a DataFrame named DF. 1
- Write Python command(s) to select the first 3 rows of the DataFrame DF, assuming that labelled index are consecutive integers starting from 0. 1
- Use Boolean indexing to filter students who scored more than 80 in Science and print it. 2

34. (a) A college library maintains a database table named BOOK_REC to store information about books. The table includes the following fields: 4

- BookID (Unique ID of each book)
- Title (Name of the book)
- Author (Name of the author)
- Price (Price of the book)
- PubDate (Date of publication)

Table: BOOK_REC

BookID	Title	Author	Price	PubDate
1	SQL Basics	Rajesh Kumar	450	2022-02-15
2	Learn Python	Anjali Sharma	550.5	2021-07-10
3	Web Development	Ravi Mehta	650	2022-02-20
4	Data Science for All	Sunita Agarwal	800.75	2020-12-05
5	Advanced Java	Rajesh Kumar	600	2021-07-18

The librarian wants to generate different reports from the database to improve management of library resources. Based on this situation, answer the following queries:

- Display the title in uppercase and length of title.
- Display the author and month name of publication for books priced above 500.
- Display the maximum, minimum, and total price of books.
- Display the books published in February.

OR

(b) A retail company stores its sales information in a table named Sales_Rec, which contains details such as Product, Quantity, Price, and SaleDate.

SalesID	Product	Quantity	Price	SaleDate
1	Laptop	5	55000	2023-08-01
2	Mouse	50	500	2023-08-03
3	Keyboard	20	1500	2023-08-05
4	Monitor	10	12000	2023-07-25
5	Printer	8	8000	2023-08-02

The sales manager wants to analyse the sales performance and product pricing trends using SQL queries. Help the manager by finding the outputs for the following queries:

- SELECT LOWER(Product) AS Product_Lower, (Quantity * Price) AS Total_Cost FROM SALES;
- SELECT * FROM SALES WHERE MONTH(SaleDate) = 8 AND YEAR(SaleDate) = 2023;
- SELECT MAX(Price) AS Max_Price, MIN(Price) AS Min_Price, AVG(Price) AS Avg_Price FROM SALES;
- SELECT Product, ROUND(Price, 2) AS Rounded_Price, Quantity FROM SALES;

SECTION – E (5 X 3 = 15 Marks)

35. Create a DataFrame from the list of dictionaries given below and perform the following:

```
data = [{'Name': 'John', 'Math': 85, 'Science': 78},
        {'Name': 'Emma', 'Math': 92, 'Science': 88},
        {'Name': 'Liam', 'Math': 74, 'Science': 81}]
```

- Display the first 3 rows. 1
- Add a new column "Total" which is the sum of "Math" and "Science" and print it. 2
- Delete the "Science" column. 1
- Rename the column "Name" to "Stu_Name". 1

36. You have a NumPy array representing sales data for a week [250, 300, 320, 280, 270, 500, 450]. Write a Python program that will perform the following: 5

- Create a Pandas Series using the array
- Label the Series with weekdays: ['Mon', 'Tue', 'Wed', 'Thu', 'Fri', 'Sat', 'Sun']
- Slice the Series to show sales from Wednesday to Saturday
- Find the average sales

37. (a) Consider the following table named as 'Student'.

RollNo	Name	Marks	City	DOB
1	Rohan Das	78.5	Kolkata	2005-08-15
2	Neha Roy	89	Delhi	2004-12-01
3	Amit Sen	69	Mumbai	2005-05-21
4	Priya Pal	92.75	Kolkata	2004-11-10
5	John Mat	85	Chennai	2005-02-05

Write SQL queries to perform the following:

- (i) Display name in lowercase and the number of characters in the name.
- (ii) Display name, marks rounded to nearest integer, and city.
- (iii) Display name and month name of birth for students from Kolkata.
- (iv) Display highest, lowest, and average marks of students.
- (v) Display roll number, name, and day name of birth for students born before 2005-01-01.

OR

(b) Consider the following table named as 'Orders'.

OrderID	CustomerName	Amount	OrderDate
201	Amit Kumar	1500	2023-05-20
202	Neha Gupta	2400.5	2023-06-12
203	Ravi Singh	3100	2023-05-25
204	Priya Das	2750.75	2023-07-01
205	John Mat	1999	2023-06-25

- (i) Display customer name in uppercase and order amount modulo 1000.
- (ii) Display customer name and day name of the order date.
- (iii) Display the month-wise total order amount.
- (iv) Display customer name and the amount rounded to the nearest integer for orders above 2000.
- (v) Display maximum, minimum, and average amount of orders.