SAMPLE QUESTION PAPER (THEORY)
CLASS XII SESSION: 2024-25
INFORMATICS PRACTICES (065)

Time allowed: 3 Hours **Maximum Marks:70**

General Instructions:

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

Q No.	Section-A (21 x 1 = 21 Marks)	Marks
1	State whether the following statement is True or False: Slicing can be used to extract a specific portion from a Pandas Series.	1
2	The purpose of **`WHERE`** clause in a SQL statement is to: (A) Create a table (B) Filter rows based on a specific condition (C) Specify the columns to be displayed (D) Sort the result based on a column	1
3	Identify the networking device responsible for routing data packets based on their destination addresses. (A) Modem (B) Hub (C) Repeater (D) Router	1

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4	Identify the SQL command used to delete a relation (table) from a relational database. (A) DROP TABLE (B) REMOVE TABLE (C) DELETE TABLE (D) ERASE TABLE	1
5	e-waste refers to: (A) Software that has become obsolete (B) Data that has been deleted from a storage device (C) Viruses that infect computers (D) Electronic devices that are no longer in use	1
6	Which of the following Python statements can be used to select a column **`column_name`** from a DataFrame **`df`** ? (A) df.getcolumn('column_name') (B) df['column_name'] (C) df.select('column_name') (D) df(column_name)	1
7	By default, the plot() function of Matplotlib draws a _____ plot. (A) histogram (B) column (C) bar (D) line	1
8	State whether the following statement is True or False: In SQL, the **`HAVING`** clause is used to apply filter on groups formed by the **`GROUP BY`** clause.	1
9	Which of the following Python statements is used to import data from a CSV file into a Pandas DataFrame (Note: pd is an alias for pandas)? (A) pd.open_csv('filename.csv') (B) pd.read_csv('filename.csv') (C) pd.load_csv('filename.csv') (D) pd.import_csv('filename.csv')	1
10	What is plagiarism?	1

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	(A) Using copyrighted material without giving proper acknowledgement to the source (B) Downloading illegal software. (C) Spreading misinformation online. (D) Hacking into computer systems.	
11	Fill in the Blank The `COUNT(*)` function provides the total number of _____ within a relation (table) in a relational database. (A) Columns (B) Unique values (C) Not-null values (D) Rows	1
12	In which of the network topologies do all devices connect to a central point, such as a switch or hub? (A) Star (B) Bus (C) Tree (D) Mesh	1
13	In a Pandas DataFrame, if the `tail()` function is used without specifying the optional argument indicating the number of rows to display, what is the default number of rows displayed, considering the DataFrame has 10 entries? (A) 0 (B) 1 (C) 4 (D) 5	1
14	Identify the type of cybercrime that involves sending fraudulent emails to deceive individuals into revealing sensitive information. (A) Hacking (B) Phishing (C) Cyberbullying (D) Cyberstalking	1
15	While creating a Series using a dictionary, the keys of the dictionary become: (A) Values of the Series	1

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	(B) Indices of the Series (C) Data type of the Series (D) Name of the Series	
16	Match the following SQL functions/clauses with their descriptions: SQL Function / Description P. `MAX()` — 1. Find the position of a substring in a string. Q. `SUBSTRING()` — 2. Returns the maximum value in a column. R. `INSTR()` — 3. Sorts the data based on a column. S. `ORDER BY` — 4. Extracts a portion of a string. (A) P-2, Q-4, R-3, S-1 (B) P-2, Q-4, R-1, S-3 (C) P-4, Q-3, R-2, S-1 (D) P-4, Q-2, R-1, S-3	1
17	Fill in the Blank Boolean indexing in Pandas DataFrame can be used for _____. (A) Creating a new DataFrame (B) Sorting data based on index labels (C) Joining data using labels (D) Filtering data based on condition	1
18	Which Matplotlib plot is best suited to represent changes in data over time? (A) Bar plot (B) Histogram (C) Line plot (D) Histogram & Bar plot	1
19	Which type of network covers a small geographical area like a single office, building, or school campus? (A) PAN (B) MAN (C) LAN (D) WAN	1
	Q-20 and Q-21 are Assertion (A) and Reason (R) Type questions. Choose the correct option as:	

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	(A) **Both Assertion (A) and Reason (R) are true, and Reason (R) is the correct explanation of Assertion (A)** (B) **Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A)** (C) **Assertion (A) is True, but Reason (R) is False** (D) **Assertion (A) is False, but Reason (R) is True**		
20	**Assertion (A):** We can add a new column in an existing DataFrame. **Reason (R):** DataFrames are size mutable.		1
21	**Assertion (A):** In SQL, `INSERT INTO` is a Data Definition Language (DDL) Command. **Reason (R):** DDL commands are used to create, modify, or remove database structures, such as tables.		1
Q No.	**Section-B (7 x 2 = 14 Marks)**		**Marks**
22	(A)	What is a Series in Python Pandas? Also, give a suitable example to support your answer. **OR**	2
	(B)	What does the term 'library' signify in Python? Mention one use for each of the following libraries: • Pandas • Matplotlib	
23	What are intellectual property rights (IPR), and why are they important in the digital world?		2
24	Consider the string: "`Database Management System`". Write suitable SQL queries for the following: I. To extract and display "`Manage`" from the string. II. Display the position of the first occurrence of "`base`" in the given string.		2
25	(A)	What is Internet and how does it differ from World Wide Web (WWW)? **OR**	2
	(B)	Explain the concept of browser cookies and mention one advantage of using them.	

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26		Define the term Primary Key in a database. Explain how it is different from a Candidate Key.	2
27		Mention two health concerns associated with excessive use of Digital Devices.	2

28	(A)	Sneha is writing a Python program to create a DataFrame using a list of dictionaries. However, her code contains some mistakes. Identify the errors, rewrite the correct code, and underline the corrections made.
		`import Pandas as pd`
		`D1 = {'Name': 'Rakshit', 'Age': 25}`
		`D2 = {'Name': 'Paul', 'Age': 30}`
		`D3 = {'Name': 'Ayesha", 'Age': 28}`
		`data = [D1,D2,D3)`
		`df = pd.Dataframe(data)`
		`print(df)`	

		OR	

	(B)	Complete the given Python code to get the required output (ignore the dtype attribute) as
		Output:
		Tamil Nadu Chennai
		Uttar Pradesh Lucknow
		Manipur Imphal
		
		Code:
		`import _____ as pd`
		`data = ['Chennai','_____','Imphal']`
		`indx = ['Tamil Nadu','Uttar Pradesh','Manipur']`
		`s = pd.Series(_____, indx)`
		`print(_____)`
			2

Q No		**Section-C (4 x 3 = 12 Marks)**	**Marks**
29		Ayesha's family is replacing their old computer with a new one. They decide to throw the old computer in a nearby empty field/plot. I. Explain any one potential environmental hazard associated with improper e-waste disposal. II. Suggest one responsible way to Ayesha's family for proper disposal of their old computer. III. Describe the importance of recycling in e-waste management.	3

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30 (A) Write a Python program to create the following DataFrame using a list of dictionaries. — 3

	Product	Price
0	Laptop	60000
1	Desktop	45000
2	Monitor	15000
3	Tablet	30000

OR

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

Russia	Moscow
Hungary	Budapest
Switzerland	Bern

31 — 2+1=3

I. Write an SQL statement to create a table named **STUDENTS**, with the following specifications:

Column Name	Data Type	Key
StudentID	Numeric	Primary Key
FirstName	Varchar(20)	
LastName	Varchar(10)	
DateOfBirth	Date	
Percentage	Float(10,2)	

II. Write SQL Query to insert the following data in the Students Table
1, Supriya, Singh, 2010-08-18, 75.5

32 (A) Consider the following tables: — 3

Table 1:

EMPLOYEE which stores Employee ID (**EMP_ID**), Employee Name (**EMP_NAME**), Employee City (**EMP_CITY**)

Table 2:

PAYROLL which stores Employee ID (**EMP_ID**), Department (**DEPARTMENT**), Designation (**DESIGNATION**), and Salary (**SALARY**) for various employees.

Note: Attribute names are written within brackets.

Table: EMPLOYEE

EMP_ID	EMP_NAME	EMP_CITY

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1	ABHINAV	AGRA
2	KABIR	FARIDABAD
3	ESHA	NOIDA
4	PAUL	SEOUL
5	VICTORIA	LONDON

Table: `PAYROLL`

EMP_ID	DEPARTMENT	DESIGNATION	SALARY
1	SALES	MANAGER	75000
2	SALES	ASSOCIATE	50000
3	ENGINEERING	MANAGER	95000
4	ENGINEERING	ENGINEER	70000
5	MARKETING	MANAGER	65000

Write appropriate SQL queries for the following:

I. Display department-wise average Salary.

II. List all designations in the decreasing order of Salary.

III. Display employee name along with their corresponding departments.

OR

(B) Consider the following tables:

Table 1:

`ATHLETE`, which stores **`AthleteID`**, **`Name`**, **`Country`**. The table displays basic information of the athletes

Table 2:

`MEDALS`, which stores **`AthleteID`**, **`Sport`**, and **`Medals`**. The table displays the number of medals won by each athlete in their respective sports.

Table: `ATHLETE`

AthleteID	Name	COUNTRY
101	Arjun	INDIA
102	Priya	INDIA
103	Asif	UAE
104	Rozy	USA
105	David	DENMARK

Table: `MEDALS`

AthleteID	Sport	Medals
101	Swimming	8
102	Track	3
103	Gymnastics	5
104	Swimming	2
105	Track	6

Write appropriate SQL queries for the following:

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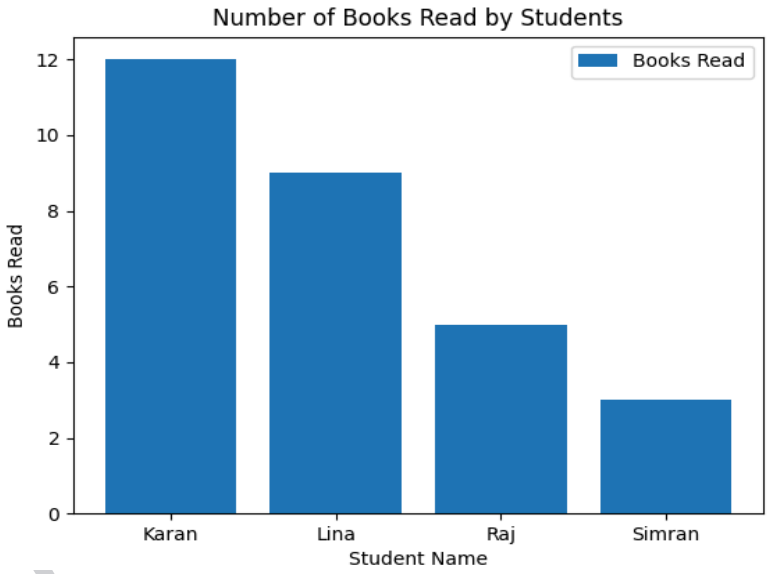
		I. Display the sports-wise total number of medals won. II. Display the names of all the Indian athletes in uppercase. III. Display the athlete name along with their corresponding sports	
Q No.		**Section-D (2 x 4 = 8 Marks)**	**Marks**
33	During a practical exam, a student Ankita has to fill in the blanks in a Python program that generates a bar chart. This bar chart represents the number of books read by four students in one month.		4

Student Name	Books Read
Karan	12
Lina	9
Raj	5
Simran	3

Help Ankita to complete the code.




```
import _____ as plt #Statement-1
students = ['Karan', 'Lina', 'Raj', 'Simran']
books_read = [12, 9, 5, 3]
plt.bar( students, _____, label='Books Read') #Statement-2
plt.xlabel('Student Name')
plt._____('Books Read') #Statement-3
plt.legend()
plt.title('_____') #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. Refer to the graph shown above and fill in the blank in Statement-2 with suitable Python code.

III. Fill in the blank in Statement-3 with the name of the function to set the label on the y-axis.

IV. Refer the graph shown above and fill the blank in Statement-4 with suitable Chart Title.

34 (A) Rahul, who works as a database designer, has developed a database for a bookshop. This database includes a table *BOOK* whose column (attribute) names are mentioned below:

BCODE: Shows the unique code for each book.
TITLE: Indicates the book's title.
AUTHOR: Specifies the author's name.
PRICE: Lists the cost of the book.

Table: **BOOK**

BCODE	TITLE	AUTHOR	PRICE
B001	MIDNIGHT'S CHILDREN	SALMAN RUSHDIE	500
B002	THE GOD OF SMALL THINGS	ARUNDHATI ROY	450
B003	A SUITABLE BOY	VIKRAM SETH	600
B004	THE WHITE TIGER	ARAVIND ADIGA	399
B005	TRAIN TO PAKISTAN	KHUSHWANT SINGH	350

I. Write SQL query to display book titles in lowercase.

II. Write SQL query to display the highest price among the books.

III. Write SQL query to display the number of characters in each book title.

IV. Write SQL query to display the Book Code and Price sorted by Price in descending order.

4

OR

(B) Dr. Kavita has created a database for a hospital's pharmacy. The database includes a table named **MEDICINE** whose column (attribute) names are mentioned below:

MID: Shows the unique code for each medicine.

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MED_NAME: Specifies the medicine name

SUPP_CITY: Specifies the city where the supplier is located.

STOCK: Indicates the quantity of medicine available.

DEL_DATE: Specifies the date when the medicine was delivered.

Table: **MEDICINE**

MID	MED_NAME	SUPP_CITY	STOCK	DEL_DATE
M01	PARACETAMOL	MUMBAI	200	2023-06-15
M02	AMOXICILLIN	KOLKATA	50	2023-03-21
M03	COUGH SYRUP	BENGALURU	120	2023-02-10
M04	INSULIN	CHENNAI	135	2023-01-25
M05	IBUPROFEN	AHMEDABAD	30	2023-04-05

Write the output of the following SQL Queries.

I. Select LENGTH(MED_NAME) from MEDICINE where STOCK > 100;

II. Select MED_NAME from MEDICINE where month(DEL_DATE) = 4;

III. Select MED_NAME from MEDICINE where STOCK between 120 and 200;

IV. Select max(DEL_DATE) from MEDICINE;

Q No.	Section-E (3 x 5 = 15 Marks)	Marks
35	ABC Pvt. Ltd., a multinational technology company, is looking to establish its Indian Head Office in Bengaluru, and a regional office branch in Lucknow. The Bengaluru head office will be organized into four departments: HR, FINANCE, TECHNICAL, AND SUPPORT. As a network engineer, you have to propose solutions for various queries listed from I to V.	5

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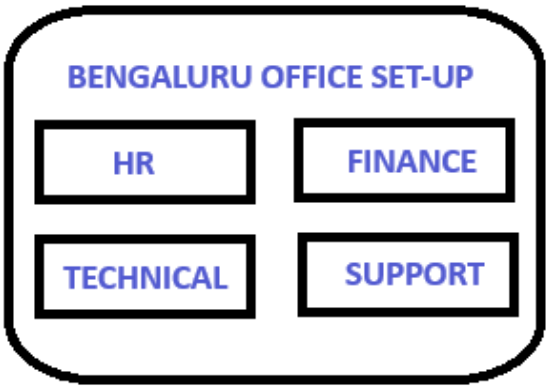

The shortest distances between the departments/offices are as follows:

HR TO FINANCE	65 M
HR TO TECHNICAL	80 M
HR TO SUPPORT	70 M
FINANCE TO TECHNICAL	60 M
FINANCE TO SUPPORT	75 M
TECHNICAL TO SUPPORT	50 M
BENGALURU OFFICE TO LUCKNOW	1900 KM

The number of computers in each department/office is as follows:

HR	175
FINANCE	35
TECHNICAL	50
SUPPORT	15
LUCKNOW OFFICE	40

I. Suggest the most suitable department in the Bengaluru Office Setup, to install the server. Also, give a reason to justify your suggested location.

II. Draw a suitable cable layout of wired network connectivity between the departments in the Bengaluru Office.

III. Which networking device would you suggest the company to purchase to interconnect all the computers within a department in Bengaluru Office?

IV. The company is considering establishing a network connection between its Bengaluru Head Office and Lucknow regional office. Which

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type of network—LAN, MAN, or WAN—will be created? Justify your answer.

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* shown below.

	MovieID	Title	Year	Rating
0	1	LAGAAN	2001	8.4
1	2	TAARE ZAMEEN PAR	2007	8.5
2	3	3 IDIOTS	2009	8.4
3	4	DANGAL	2016	8.4
4	5	ANDHADHUN	2018	8.3

Write Python statements for the DataFrame **`df`** to: 5

I. Print the first two rows of the DataFrame **`df.`**

II. Display titles of all the movies.

III. Remove the column rating.

IV. Display the data of the **`'Title'`** column from indexes 2 to 4 (both included)

V. Rename the column name **`'Title'`** to **`'Name'`**.

37 (A) Write suitable SQL query for the following:

I. To display the average score from the **`test_results`** column (attribute) in the **`Exams`** table

II. To display the last three characters of the **`registration_number`** column (attribute) in the **`Vehicles`** table. (Note: The registration numbers are stored in the format DL-01-AV-1234)

III. To display the data from the column (attribute) **`username`** in the **`Users`** table, after eliminating any leading and trailing spaces. 5

IV. To display the maximum value in the **`salary`** column (attribute) of the **`Employees`** table.

V. To determine the count of rows in the **`Suppliers`** table.

(B) **OR**

Write suitable SQL query for the following:

I. Round the value of pi (3.14159) to two decimal places.

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		II. Calculate the remainder when 125 is divided by 8. III. Display the number of characters in the word 'NewDelhi'. IV. Display the first 5 characters from the word 'Informatics Practices'. V. Display details from `'email'` column (attribute), in the `'Students'` table, after removing any leading and trailing spaces.	

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