SAMPLE PAPER-1

Class: XII

Time allowed: 3 Hours   **Subject: Informatics Practices (065)**   **Maximum Marks: 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. A student has to 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 (21 x 1 = 21 Marks)	
Q1	State whether the following statement is True or False: The head() function in Pandas displays the first 10 rows of a DataFrame by default.	1
Q2	Predict the output of the following code: select round (783.34, -2);	1
Q3	Meena receives a call pretending to be from her bank, asking for her debit card details to verify her account. This is an example of _____. (A) Phishing (B) Identity Theft (C) Cyberbullying (D) Hacking	1
Q4	Which of the following statements is used to read data from a CSV file into a DataFrame? (A) pd.readfile() (B) pd.read_csv() (C) pd.import_csv() (D) pd.load()	1
Q5	Which device is used to regenerate and amplify signals in a network? (A) Router (B) Repeater (C) Switch (D) Hub	1
Q6	The SQL function ROUND(125.756, 2) will return _____. (A) 125.75 (B) 125.756 (C) 125.76 (D) 125.70	1
Q7	Which intellectual property right protects the logo of a company? (A) Patent (B) Copyright (C) Trademark (D) Design	1
Q8	In a Pandas Series, if a custom index is not provided, the default index starts from _____. (A) 1 (B) 0 (C) -1 (D) None	1
Q9	Which of the following can be NULL? (A) Primary Key (B) Foreign Key (C) Candidate Key (D) Alternate Key	1
Q10	Which of the following applications uses VoIP technology? (A) Zoom video call (B) Online shopping (C) Email (D) SMS	1
Q11	What does the following query return? SELECT AVG(salary) FROM Employee; (A) The sum of all salaries (B) The average of all salaries (C) The total number of employees (D) The highest salary	1
Q12	When two Pandas Series with non-matching indices are added, the missing values are filled with _____. (A) 0 (B) NULL (C) NaN (D) Blank	1
Q13	The main law governing cybercrimes and digital signatures in India is the _____. (A) Digital Security Act, 2001 (B) Information Technology Act, 2000 (C) Cyber security Act, 2005 (D) Internet Safety Act, 2008	1
Q14	Salma created a relation "Books" with 3 rows and 6 columns, she added one row and deleted one column. What is its degree and cardinality?	1
Q15	Which Python statement returns the first 4 rows from DataFrame df? (A) df.head(4) (B) df.tail(4) (C) df.loc[:4] (D) df.iloc[4]	1
Q16	In which network topology are all computers connected to a single central cable? (A) Star (B) Bus (C) Mesh (D) Ring	1
Q17	Select monthname('2025-09-29'); will return	1

	(A) 09 (B) sep (C) September (D) october	
Q18	Which command will create an empty Pandas Series? (A) pd.Series() (B) pd.Series([]) (C) pd.Series(None) (D) pd.Series.empty()	1
Q19	The COUNT(*) function in SQL: (A) Counts only numeric values (B) Counts only non-NULL values (C) Counts all rows including duplicates and NULLs (D) Counts only unique rows	1
Q20 and Q21 are Assertion(A) and Reason(R) based questions. Mark the correct choice as: (A) Both A and R are true and R is the correct explanation for A (B) Both A and R are true and R is not the correct explanation for A (C) A is True but R is False (D) A is False but R is True
Q20	Assertion (A): The statement df.loc[1:3] in Pandas returns rows with index labels 1, 2, and 3. Reason (R): The .loc[ ] indexer in Pandas includes the end index value while slicing.	1
Q21	Assertion (A): The DELETE command is a DML command in SQL. Reason (R): DML commands are used to define the structure of database tables.	1
Section-B (7 x 2=14 Marks)
Q22	(A) Explain the use of shape and columns attributes in a DataFrame with an example. **OR** (B) List any two differences between a NumPy ndarray and a Pandas DataFrame	2
Q23	Mention any two harmful effects of improper disposal of E-waste.	2

Q24	Kavita wants to create a Pandas Series named sales as shown below:
	          2021 101
	          2022 115
	          2023 126
	Help him in completing code below to achieve the desired output. Note: sales_record is a list.
	import _____ as p
	sales_record = _____
	s1 = p._____(sales_record)
	print(s1)
		2

Q25	(A) Aman, a student of Class XII, is learning how data travels over the internet. He wants to know how the data is divided and transmitted from one computer to another in a network. **OR** (B) Mention the protocols used for sending and receiving the email over internet with explanation.	2
Q26	**Write SQL queries to perform the following:** (i) Write a query to find the remainder when 75 is divided by 7. (ii) Write a query to display only the first 5 characters of the string "Programming".	2
Q27	Explain the following two terms: I. Intellectual property rights (IPR) II. Plagiarism	2
Q28	**(A) Write the output of the following code:** import pandas as pd cities = pd.Series(['Delhi', 'Kolkata', 'Chennai']) codes = pd.Series([110001, 700001, 600001]) data = {'City': cities, 'PinCode': codes} df = pd.DataFrame(data) df.rename(columns={'PinCode': 'PostalCode'}, inplace=True) print(df) **OR** **(B) Write the output of the following code:** import pandas as pd players = pd.Series(['Rohit', 'Virat', 'Dhoni', 'Hardik']) runs = pd.Series([85, 90, 75, 60]) data = {'Player': players, 'Runs': runs} df = pd.DataFrame(data)	2

	df.drop(index=2, inplace=True) print(df)	
Section-C (4 x 3 = 12 Marks)	
Q29	A company stores customer names, addresses, and bank details in an online database without encryption. I. Define data protection. II. What risks does the company face if this data is leaked? III. Mention two best practices the company should follow to ensure data safety.	3

Q30 (A) Write a Python program to create a Pandas Series as shown below using a ndarray, where the day names are the indices and the corresponding temperature are the values in the series.

Sunday	31
Monday	28
Tuesday	29
Wednesday	32
Thursday	33
Friday	28
Saturday	29

OR

(B) Write a Python program to create the Pandas DataFrame displayed below using a dictionary of lists.

	Car_sno	Car_name
C1	S01	Nexon
C2	S02	Breeza
C3	S03	Creta
C4	S04	Maruti Suzuki

3

Q31 I. Write an SQL statement to create a table named PURCHASE, with the following specifications:

Column Name	Datatype	Constraint
CNO	Varchar(5)	Primary Key
CNAME	Varchar(15)	
CITY	Varchar(10)	
QUANTITY	Numeric	Not Null
DOP	Date	

II. Write an SQL Query to insert the following data into the PURCHASE table:
C01, Gautam Kumar, Sirsa, 20, 2025-04-10

3
2
1

Q32 (A) Consider the following tables: Table 1: LOAN

LOAN_NO	BRANCH_NAME	AMOUNT
Q-21	DELHI	8000
Q-22	AGRA	10000
Q-23	MATHURA	25000

Table 2: CUSTOMER

CUST_NAME	LOAN_NO
KOMAL	Q-22
HARISH	Q-21

Write appropriate SQL queries for the following:
I. To list names of all customers with their Amount in Ascending order
II. Display name of all branches in uppercase where loan amount taken by customer is less than 20000.
III. Display the names of customers along with their branch name and amount.

OR

(B) Shiva, a database analyst has created the following table:

RegNo	SName	Stream	Optional	Marks
S1001	Akshat	Science	CS	99
S1002	Harshit	Commerce	IP	95
S1003	Devika	Humanities	IP	100
S1004	Manreen	Commerce	IP	98
S1005	Gaurave	Humanities	IP	82
S1006	Saurave	Science	CS	NULL
S1007	Bhaskar	Science	CS	95
S1007	Bhaskar	Science	CS	96

I. Which attribute in the Table can be considered as the Primary Key? Provide justification for your answer

3

II. Write a SQL query to add a new column, Percentage, of numeric data type to the table.
III. Write the output of the following SQL Query.
SELECT Stream, COUNT(*) FROM CLASS_XI GROUP BY Stream;

Section-D (2 x 4 = 8 Marks)

Q33	Ananya, a data analyst, is working on a Python program to create a bar graph that represents the number of laptops sold by a store over five different months. However, some parts of her code are incomplete. Help Ananya by filling in the blanks in the following Python program. Help Ananya to complete the code.	4

_____ as plt   #Statement-1

Months = ['January', 'February', 'March', 'April', 'May']

Sales = [120, 150, 180, 200, 230]

_____   #Statement-2

plt.xlabel('Months')

plt.ylabel('Number of Laptops Sold')

_____   #Statement-3

_____   #Statement-4

plt.legend()

plt.show()

Month	Laptops Sold
January	120
February	150
March	180
April	200
May	230

I. Write 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 graph with the appropriate data and includes a label.
III. Fill in the blank in Statement-3 with the correct Python code to set the title of the graph.
IV. Fill in the blank in Statement-4 with the appropriate Python code to save the graph as an image file named laptop_sales.png.

Q34	(A) Raman, who works as a database designer, has created a table Stock as shown below:	4

Pid	PName	Category	Qty	Price
1	MOUSE	IO	10	400
2	ROUTER	NW	2	2700
3	SWITCH	NW	3	9000

Write suitable SQL query for the following.
I. To display the category and its average price.
II. To display the records in decreasing order of price.
III. To display category and category wise highest price of the products.
IV. To display category and category wise total quantities of products.

OR

(B) Consider the following table PURCHASE and write the output of the following SQL Queries.

CNO	CNAME	CITY	QUANTITY	DOP
C01	Gautam Kumar	Sirsa	20	2025-04-10
C02	Meena Sharma	Chandigarh	120	2025-03-15
C03	Rakesh Gupta	Delhi	80	2025-02-05
C04	Anita Singh	Chandigarh	150	2025-03-20

Write the output of the following SQL Queries.
I. SELECT LENGTH(CNAME) FROM PURCHASE WHERE QUANTITY>100;
II. SELECT CNAME FROM PURCHASE WHERE MONTH(DOP)=3;
III. SELECT MOD (QUANTITY, DAY(DOP)) FROM PURCHASE WHERE CITY = 'CHANDIGARH';
IV. SELECT COUNT (DISTINCT CITY) FROM PURCHASE;

Section-E (3 x 5 = 15 Marks)

Q35	MediCare Hospitals Ltd. is opening a new branch in Kolkata. The branch has four separate buildings: Administration, Outpatient Department (OPD), Pharmacy, and Diagnostics. The Head Office of MediCare is in Lucknow. The number of computers in each department/ office/ block	5

	is as follows: As a network engineer, you have to propose solutions for various queries listed from I to V	

Blocks	No. of Computers
Administration	110
OPD	45
Pharmacy	20
Diagnostics	55

Distances (within Kolkata campus):	
Administration to OPD	70 m
Administration to Pharmacy	90 m
Administration to Diagnostics	50 m
OPD to Pharmacy	40 m
OPD to Diagnostics	60 m
Pharmacy to Diagnostics	80 m
Kolkata to Lucknow (Head Office)	750 m

I. Suggest the most suitable building in the Kolkata campus to install the server and justify.
II. Draw/describe a suitable cable layout for wired connectivity inside the campus.
III. Which hardware device will you suggest to connect all computers within each building?
IV. Suggest the type of network to connect Kolkata campus and Lucknow head office (LAN/MAN/WAN).
V. Which device would you use to regenerate/amplify signals over long intra-campus cables?

Q36 — **5**

Consider the DataFrame emp_df shown below.

	Name	Designation	Salary
0	Riya Mehta	Analyst	60000
1	Kumar	Developer	75000
2	Sneha Gupta	Manager	90000
3	Karan Patel	Designer	70000
4	Pooja Sharma	Developer	80000

Write Python statements for the following tasks:
I. Display the first three rows of the DataFrame emp_df.
II. Add a new column named "Bonus" with values [5000, 7000, 10000, 6000,8000].
III. Delete the column "Designation" from the DataFrame.
IV. Rename the column "Salary" to "Monthly_Salary".
V. Display only the "Name" and "Bonus" columns from the DataFrame.

Q37 — **5**

A) Write suitable SQL queries for the following:
I. To display the length of customer names stored in the CustomerName column from the Customers table.
II. To display the average salary of employees from the Salary column in the Employees table.
III. To display month name of each order date from the OrderDate column in the Orders table.
IV. To convert all product names of ProductName column of the Products table to uppercase.
V. To display the system's current time.

OR

(B) Write suitable SQL queries for the following:
I. To display the total number of characters in the string "InformationTechnology".
II. To find the position of the first occurrence of the letter 'e' in the Emp_Name column of the Employees table.
III. To calculate the cube of each value stored in the Marks column of the Students table.
IV. To display the average price of products from the Price column in the Products table.
V. To display the total sum of quantities from the Quantity column in the Orders table.