	ARMY PUBLIC SCHOOL, BANGALORE **PREBOARD II (2024-25)**	
Date: 09/12/2024	**Set: 1**	**Max Marks: 70**
Subject: Informatics Practices(065)	**Name:**	**Time: 3 Hrs**
Class: XII	**Roll No:**	**No of Pages : 13**

General Instructions:

- Please check this question paper contains 37 questions.
- All questions are compulsory.
- 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.

Section-A (21 x 1 = 21 Marks)

1.	The GROUP BY clause in SQL is primarily used to: (A) Delete rows from a table (B) Add a new column to the table (C) Remove duplicates from the result set. (D) Group rows that share the same values.	(1)

2.	Which of the following Python statements can be used to delete a column 'RollNo' from a DataFrame df? (A) df.drop(columns=['column_name']) df.drop(['RollNo'], axis=1, inplace=True) (B) df.pop('RollNo') (C) del df['RollNo'] (D) All of the above	(1)
3.	In which of the network topologies are all devices(nodes) on the network is connected to a central device, such as a hub or a switch? (A) Star (B) Tree (C) Mesh (D) Bus	(1)
4.	Which of the following is not a valid chart type ? (A) lineplot (B) bargraph (C) histogram (D) statistical	(1)
5.	What does e-waste stand for (A) Environmental waste (B) Electronic waste (C) Electrical waste (D) Equipment waste	(1)
6.	It allows a visited website to store its own information about a user on the user's computer: (A) Spam (B) Cookies (C) Malware (D) Adware	(1)
7.	Which of the following attribute is used to convert all rows of a DataFrame to columns and all columns to rows. a. Transpose	(1)

	b. T c. inverse d. dim	
8.	State whether the following statement is True or False: "In SQL, the DELETE command removes only the records from a table without deleting its table structure."	(1)
9.	To extract row/column from a dataframe _____ function may be used. (A) row() (B) column() (C) loc() (D) All of these	(1)
10.	Anna Roy, a graphic designer, came up with a visual symbol/ logo for her organization. Which of the following helps her to protect her intellectual property and protects her rights as the creator of the visual symbol/logo? (A) Trademark (B) Patent (C) Copyright (D) Digital Footprints	(1)
11.	Consider the Dataframe Temp: What will be output for the below given python statement: - **print(Temp.head(-2))** (A) (B) **Z4** Kolkata 39	(1)

	City	Temp
Z1	Delhi	40
Z2	Mumbai	31
Z3	Chennai	29
Z4	Kolkata	39
Z5	Pune	28

	City	Temp
Z3	Chennai	29

	Z4 Kolkata 39 **Z5** Pune 28 (C) **City** **Temp** **Z1** Delhi 40 **Z2** Mumbai 31 **Z3** Chennai 29 **Z5** Pune 28 (D) **City** **Temp** **Z1** Delhi 40 **Z2** Mumbai 31	
12.	Fill in the Blank The following code create a DataFrame df with _____ columns import pandas as pd df = pd.DataFrame([{'a':25 , 'b':50},{'a':15,'b':50,'c':30,'d':50}]) print(df) (A) 1 (B) 2 (C) 3 (D) 4	(1)
13.	To display first three elements of a Series object S, you may write (A) S[:3] (B) S[3] (C) S[3rd] (D) All of these	(1)
14.	Mr. Sridhar , a school teacher wants to transfer data between their smartphone and laptop using Bluetooth in computer lab. Which type of network would this fall under? (A) PAN (B) LAN (C) WAN (D) MAN	(1)
15.	A DataFrame is : (A) Value immutable (B) Size immutable (C) Both value and size mutable (D) Both value and size immutable	(1)

16. Match the following SQL functions / clauses with their descriptions: (1)

SQL Functions	Descriptions
(1) MID()	(a) Returns the current date and time.
(2) CONCAT()	(b) Finds the position(first occurrence) of a substring
(3) INSTR()	(c) To extract a substring from a string
(4) NOW()	(d) Adds two or more expressions/strings together

(A) 1- d , 2 – a , 3 – b , 4 – c

(B) 1- a , 2 – d , 3 – b , 4 – c

(C) 1- c , 2 – d , 3 – b , 4 – a

(D) 1- d , 2 – c , 3 – b , 4 – a

17. What will be the output of the following code? (1)

```
import pandas as pd
myser = pd.Series([0,0,0])
print(myser)
```

(A)

```
0    0
0    0
0    0
```

(B)

```
0    1
0    1
0    2
```

(C)

```
0    0
1    0
2    0
```

(D)

```
0    0
1    1
2    2
```

18. URL stands for _____ (1)

(A) Unique reference label

(B) Uniform reference label

(C) Uniform Resource Locator

(D) Unique Resource Locator

19.	Ms Trisha who is an employee of a private sector organization receives an email claiming to be their bank, asking them to click a link and update their personal information. This is an example of which type of cybercrime? (A) Phishing (B) Stalking (C) Ransomware (D) Spyware	(1)
Q20 and Q21 are ASSERTION AND REASONING based questions. **Choose the correct option as:** (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): Histograms are column-charts, where each column represents a range of values, and the height of a column corresponds to how many values are in that range. Reason (R): Histograms is created using histplot( ) function.	(1)
21.	Assertion (A): The primary law in India dealing with cybercrime and electronic commerce is Indian Technology Act, 2000. Reasoning (R): Intellectual Property refers to the inventions, literary and artistic expressions, designs and symbols, names and logos.	(1)
Section-B (7 x 2 = 14 Marks)		
22.	(A) What is the difference between LAN and MAN? **OR** (B) What is a Gateway? Explain.	(2)
23.	Write a Python program to create the following DataFrame **Student** using a **List of Dictionaries**	(2)

	Sno	Sname	Mail	Mark
S01	1	Nishant	n@gmail.com	95
S02	2	Chirag	c@gmail.com	98
S03	3	Yoganand	y@gmail.com	92

24.	Sheetal is a Trainee Software Engineer in an ecommerce company. She has been assigned a task to find the average price of product for categories available on the website of the company but display only those where the average price in the category is more than 150. She wrote the following SQL query but she is getting error in it. **Select PNAME, AVG(PRICE) from product where AVG(Price)>150;** Help her in identifying the reason for the error and write the correct query by suggesting the possible correction.	(2)
25.	(A) What is a Series in Python Pandas? Explain with an example. **OR** (B) How do the head() and tail() functions work in a Pandas Series?	(2)
26.	Pooja writes the following commands with respect to a table employee having fields, empno, name, department, commission. **Command1** : Select count(*) from employee; **Command2**: Select count(commission) from employee; She gets the output as 4 for the first command but gets an output 3 for the second command. Explain the output with justification.	(2)
27.	What do you understand by digital footprint? What are the different types of digital footprints?	(2)
28.	(A) Consider following dataframe "SalesData" :	(2)

	EmpCode	Zone	Product	SalesQty
10	E101	NORTH	DESKTOP	160
20	E102	SOUTH	LAPTOP	290
30	E103	EAST	MONITOR	70
40	E104	WEST	MONITOR	347
50	E105	SOUTH	PROCESSOR	90

(i) Write python statement to display only those rows where the Product is MONITOR.
(ii) Write python statement to display only Zone column.

OR
(B) What will be the output of the following:

```
import pandas as pd
x= [20, 40,90, 110]
y=pd.Series([20, 40,90, 110])
print (x*2)
print(y*2)
```

Section-C (4 x 3 = 12 Marks)

29.	Explain the following: (a) Plagiarism (b) Email spoofing (c) FOSS	(3)
30.	(A) Write a Python program to create the following DataFrame **DFComp** using a **Dictionary of Series** **OR** (B). Write a Python Program to create a Pandas Series **Players** as shown below using a dictionary. Note that the left column indicates the indices and the right column displays the data.	(3)
31.	I. Write an SQL statement to create a table named NUTRIENTS, with the following specifications: II. Write SQL Query to insert the following data in the NUTRIENTS Table:- 1224, Britannia Cheese, 24 March 2025	(3)
32.	(A) Consider the following tables: **Table 1:** Flights which stores FlightId, model and company **Table 2:**	(3)

	Company	City	EmpCount
C1	Microsoft	San Fransico	221000
C2	Coco Cola	New York	79100
C3	Infosys	Bangalore	317000
C4	Toyota	Toyota City	380793

Virat Kohli	Cricket
Neeraj Chopra	Javelin throw
Mary Kom	Boxing

Column Name	Data Type	Key
Code	Numeric	Primary Key
FoodItemName	Varchar(20)	
Calories	Numeric	
ExpiryDate	Date	
Price	Float(7,2)	

Booking which stores Ticket number(Ticketno), passenger name(passenger), source, destination, quality, price and Flightid

Table: Flights

Flightid	model	company
10	747	Boeing
12	320	Airbus
15	767	Boeing

Table: Booking

Ticketno	passenger	source	destination	quantity	price	Flightid
10001	AJAY	BAN	DELHI	2	7000	10
10002	RIYA	BAN	KOLKATA	3	7500	12
10003	MOHAN	DEL	MUMBAI	1	6000	15
10004	RISHI	MUM	KOLKATA	2	5600	12
10005	VIJAY	MUM	DELHI	4	5000	10

Write appropriate SQL queries for the following:

a)Write a query to count flights booking source wise.

b) Increase 10% fare/price of those flight booking whose destination is Delhi

c) Display Passenger name ,source along with the model and company details.

OR

(B). Consider the following tables:

Table 1:

Stationary , which stores stationary id (S_ID), Stationary Name(StationaryName), Company and Price

Table 2:

Consumer, which stores Consumer id (C_ID), Consumer_Name , Address and stationary id (S_ID)

Table:- Stationary

S_ID	StationaryName	Company	Price
DP01	Dot Pen	ABC	10
PL02	Pencil	XYZ	6
ER05	Eraser	XYZ	7
PL01	Pencil	CAM	5
GP02	Dot Pen	ABC	15

Table:- Consumer

C_ID	Consumer_Name	Address	S_ID
1	Rajat	Delhi	PL01
6	Mohini	Mumbai	GP02
12	Ragini	Delhi	DP01
15	Anil	Delhi	PL02

Write appropriate SQL queries for the following:

I. Display company wise average Price

II. Display length of those consumer name who are residing in Mumbai

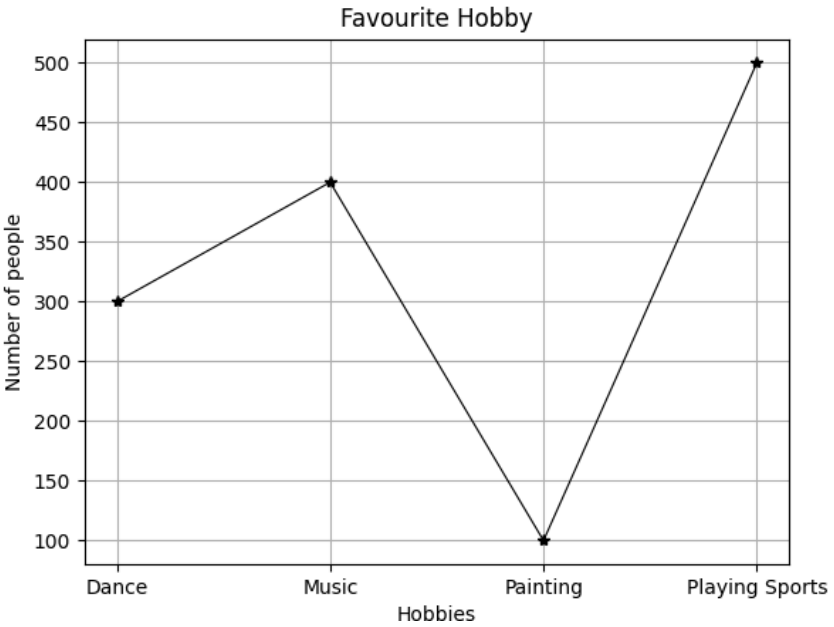
III. Display the Company , stationaryname along with their consumer name

Section-D (2 x 4 = 8 Marks)

33. Write suitable Python code to create 'Favourite Hobby' Line graph as shown below: (4)

The data and specifications for creating the graph is:

Hobbies = ['Dance', 'Music', 'Painting' , 'Playing sports']
No of people = [300, 400, 100, 500]
colour= green
marker='*'
line width = 0.5



Also give suitable python statement to save this chart with name HobbyLineGraph.png.

34. (A) Marketing team of the company Poorvika Ltd is maintaining a database for their company. This database includes table SALESMAN, details are shown below: (4)

Table : **SALESMAN**

Scode	Sname	Area	Qtysold	Dateofjoin
S001	Ravi	North	120	2015-10-01
S002	Sandeep	South	105	2012-08-01
S003	Sunil	NULL	68	2018-02-01
S004	Subh	West	280	2010-04-01
S005	Ankit	East	90	2018-10-01
S006	Raman	North	NULL	2019-12-01

Based on the given table SALESMAN, write SQL queries to perform the following operations:

(i) Display all the records in descending order of Sname.

(ii) Display the average Qtysold from each area where number of salesman is less than 2

(iii) Display the minimum Qtysold from each area.

(iv) Count the total number of salesman.

OR

(B) With reference to the below given table SALESMAN, Predict output for the below given commands :

Table : **SALESMAN**

Scode	Sname	Area	Qtysold	Dateofjoin
S001	Ravi	North	120	2015-10-01
S002	Sandeep	South	105	2012-08-01
S003	Sunil	NULL	68	2018-02-01
S004	Subh	West	280	2010-04-01
S005	Ankit	East	90	2018-10-01
S006	Raman	North	NULL	2019-12-01

Write the output of the following SQL Queries.

(i) SELECT MIN(Qtysold), MAX(Qtysold) FROM SALESMAN;

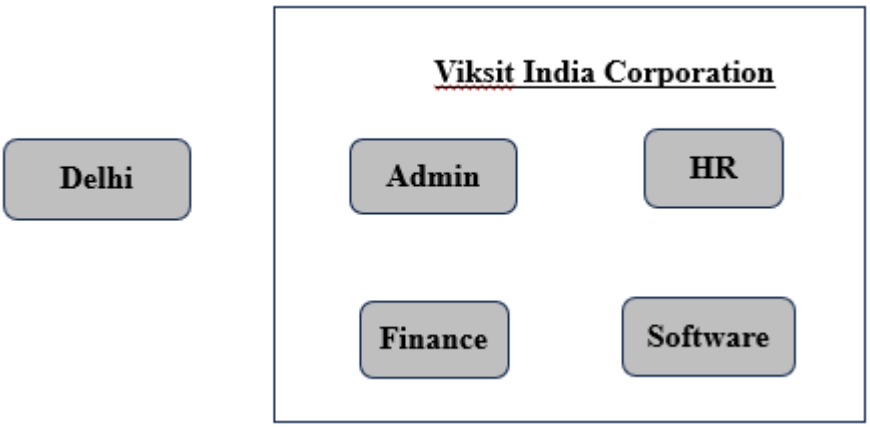
(ii) SELECT COUNT(Qtysold) FROM SALESMAN;

(iii) SELECT LENGTH(Sname) FROM SALESMAN WHERE MONTH(DateofJoin) < 10;

(iv) SELECT Sname FROM SALESMAN WHERE RIGHT(Scode,1) = 4;

Section-E (3 x 5 = 15 Marks)

35. Viksit India Corporation is a start up company. The company is planning to setup their offices in India with its hub at Bangalore with its 4 blocks namely ADMIN, HR, FINANCE and SOFTWARE. You as a network expert have to suggest the best network related solutions for their problems raised in (i) to (v), keeping in mind the distances between the buildings and other given parameters. (5)



Block to Block distance(in meters):

Block(From)	Block	Distance(in meter)
Admin	Finance	60
Admin	Software	80
Admin	HR	75

Finance	**Software**	**110**
Finance	**HR**	**65**
Software	**HR**	**90**

Expected number of Computers to be installed in each block:

Admin	**40**
Finance	**35**
Software	**110**
HR	**55**

The company is planning to form a network by joining these blocks.

I. Suggest an ideal layout for connecting these blocks/centers. Also suggest a suitable topology.

II What will be the most appropriate block where the company should plan to install their server?

III For cost cutting , the organization has opted for online meetings. Suggest the protocol that is used for sending the voice signals over internet. Also, give an example of an application that can be used for online meetings.

IV. Viksit India Corporation intends to link its Bangalore center to the head office in Delhi. Out of LAN, MAN, or WAN, what kind of network will be created? Justify your answer.

V. Suggest the placement of the following devices with proper justification:-

(i) Switch/Hub

(ii) Repeater

36. Haridev designed the Dataframe TempDF that contains the temperature of different Zone(Z1, Z2,Z3) as shown below. **Consider the given dataframe TempDF and write Python code for the following:** (5)

	City	**Maxtemp**
Z1	Delhi	40
Z2	Mumbai	31
Z3	Chennai	29

Write Python Statement to do the following :

a. Add a new column MinTemp with value 32,23, & 21 for Z1,Z2 & Z3 respectively

	b. Add a new row Z4 with values “Bangalore”, 28 and 21 for City, Maxtemp and MinTemp respectively. c. Display only the rows Z1 and Z3 of the dataframe TempDF d. Change the Maxtemp of row Z2 to 39 e. Save the content of dataframe to a CSV file “TempDFdata.CSV”	
37.	**Write suitable SQL query for the following based on the table “SALESMAN”:** **SNO** | **SNAME** | **SALARY** | **BONUS** | **DateofJoin** A01 | Beena Mehta | 30000 | 300.23 | 2019-10-29 A02 | K L Sahay | 50000 | 500.34 | 2018-03-12 B03 | Nisha Thakkar | 30000 | 400.00 | 2018-03-18 B04 | Leela Yadav | 80000 | NULL | 2018-12-31 C05 | Goutam Singh | 20000 | NULL | 1989-01-23 C06 | Tripti Garg | 70000 | 600.37 | 1987-06-15 D07 | Neena Sharma | 50000 | 550.89 | 1999-03-18 (i) Display the total salary of the salesman table. (ii) Display the last five characters of salesman names. (iii) Display the four characters from salesman name starting from second character. (iv) Display the month name for the date of join of salesman. (v) Display the name of the weekday for the date of join of salesman. **OR** **Write suitable SQL query using MySql functions for the following:** i. Display First 7 Characters of the String ‘APS KAMARAJ ROAD’. ii. Display the position of occurrence of string ‘RAJ’ in the string ‘APS KAMARAJ ROAD’. iii. Round off the value 4335.78 to two decimal place. iv. Display the remainder of 950 divided by 4. v. Remove all the expected leading and trailing spaces from a column BookName of the table ‘Library’. (Column Name : BookName, Table Name : Library)	(5)

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