INFORMATICS PRACTICES (065)

Class : XII

Time Allowed: 3 Hours **SET-2** **Maximum Marks: 70**

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General Instructions:

- Please check this question paper contains 37 questions.
- Read the questions very carefully.
- 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, **Section A to 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.
- Please write down the serial number of the question in the Answer-book before attempting
- Please check that this question paper contains **37** questions.
- **In case of MCQ, text of the correct answer should also be written.**

SECTION – A (21 x 1 = 21 Marks)

1.	State whether the following statement is True or False: a. A pandas DataFrame can contain homogenous data only.	**1**
2.	The purpose of the GROUP BY clause in a SQL statement is to: (A) Filter rows based on a condition (B) Group rows that have the same values in specified columns (C) Sort the result based on a column (D) Specify the columns to be displayed	**1**
3.	The primary function of a modem in a computer network is to: (A) Amplify the network signal (B) Connect multiple computers within a local network (C) Convert digital signals to analog signals and vice versa (D) Route data packets between networks	**1**

4.	Which of the following SQL queries is used to retrieve rows from the "customers" table where the "email" column contains NULL values? (A) SELECT * FROM customers WHERE email = NULL; (B) SELECT * FROM customers WHERE email IS NOT NULL; (C) SELECT * FROM customers WHERE ISNULL(email); (D) SELECT * FROM customers WHERE email IS NULL;	**1**
5.	Which of the following is a responsible way to manage e-waste? (A) Disposing of electronic devices in landfills (B) Incinerating old electronic devices (C) Recycling or refurbishing electronic devices (D) Storing unused electronic devices in storage rooms	**1**
6.	Find the output of the following python code:- import pandas as pd df = pd.DataFrame({'KVs': ['KV1', 'KV2', 'KV3', 'KV4', 'KV5']}) print(df.head(-2)) (A) KVs 0 KV1 1 KV2 2 KV3 (B) KVs 0 KV1 1 KV2 (C) KVs 0 KV1 1 KV2 2 KV3 3 KV4 4 KV5 (D) Error	**1**
7.	Which is the correct import statement to import pyplot? (A) import pyplot.matplotlib as plt (B) import pyplot from matplotlib (C) import matplotlib.pyplot as plt (D) None of the above	**1**
8.	State whether the following statement is True or False: "In SQL, the DELETE command removes rows from a table along with its table structure.	**1**
9.	What is the default separator (delimiter) when reading a CSV file using pd.read_csv() in Pandas? (Note: pd is an alias for pandas) A) Semicolon (;) B) Comma (,) C) Tab (\t) D) Pipe (|)	**1**
10.	Master Raj , class XII student, writes a book titled "All round development in KVS". What type of intellectual property protects his rights as the author of the book? A) Trademark B) Patent C) Copyright D) Trade secret	**1**
11.	The query SELECT department, SUM(salary) FROM employees _____ department; will return the total salary for each department. A) GROUP BY B) ORDER BY C) HAVING	**1**

	D) WHERE	
12.	In a bus topology, what happens if the main cable (the backbone) fails? A) Only the devices connected after the break stop working B) The entire network fails C) Devices continue to communicate through secondary routes D) Only the central device fails	**1**
13.	Consider the DataFrame (DF): Name Age Department Anjali 25 Sales Ramesh 30 HR Priya 35 Marketing Amit 28 IT What will be the output of DF.loc[1, 'Name']? (A) Priya (B) Ramesh (C) Anjali (D) 1, Name	**1**
14.	A teacher receives an email claiming to be from 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) Hacking C) Ransomware D) Spyware	**1**
15.	Which of the following is a one-dimensional array containing a sequence of values in Python? A) Relation B) DataFrame C) Series D) Square	**1**
16.	Match the following SQL functions with their purpose: SQL Function / Description P. COUNT() — 1. Finds the position of a substring Q. CONCAT() — 2. Returns the total number of rows R. INSTR() — 3. Return the length of the string, S. LENGTH() — 4. Adds two or more expressions/strings together (A) P-1, Q-2, R-3, S-4 (B) P-2, Q-1, R-3, S-4 (C) P-2,Q-4, R-1, S-3 (D) P-4, Q-2, R-1, S-3	**1**
17.	Which of the following can be used to specify the data while creating a DataFrame?	**1**

	(A) Dictionaries (B) Series (C) ndarrays (D) All of the above	
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.	Mr. Ram , a computer science 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**
	Q-20 and Q-21 are Assertion (A) and Reason (R) Type 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):- DataFrame has both a row and column index. Reasoning (R): - A DataFrame is a two-dimensional labelled data structure like a table of MySQL.	**1**
21.	Assertion (A): The CREATE TABLE command is used to add new rows to an existing table in SQL. Reason (R): The CREATE TABLE command defines the structure of a new table, including its columns and data types.	**1**
	Section-B (7 x 2 = 14 Marks)	
22.	**(A).** What are the difference between Series and Dataframe. Write any two differences. OR **(B).** What does the term 'library' signify in Python? Mention one use for the following libraries: • Matplotlib	**2**
23.	What do you mean by FOSS? Name any two free and open source software.	**2**
24.	A string is given as “Humpty Dumpty”. Write suitable SQL queries for the following: I. Count how many characters are there in above string. II. Display above string in uppercase."	**2**
25.	**(A).** Explain the role of a web browser in accessing the internet? Write any 2 names of web browsers.	**2**

	OR **(B).** What do you mean by webpage? How is static web pages differ from the dynamic webpages.	
26.	Distinguish between primary key and candidate key with example.	**2**
27.	As a student, what two advice you should give to other student for e-waste disposal? **OR** Differentiate between STAR and BUS topology. (Any two points)	**2**
28.	**(A).** Parul , class XII student , writes a Python program to create a DataFrame. However, her code contains some mistakes. Identify the errors, rewrite the correct code, and underline the corrections made. import pantas as pd Rollno= [1101, 1102,1103] Name= ['Teena', 'Jay', 'Rishi'] Age=[26,27,35] Final= [Rollno, Name, Age] df= pdf.DataFrame(Final, INDEX= ['Stud1', 'Stud2', 'Stud3']) print(DataFrame) OR **(B)** Complete the given Python code to get the required output (ignore the dtype attribute) as Output: Jan 31 Feb 28 Mar 31 Apr 30 Code:- _____pandas as pd Month_Day = pd._____({'Jan': 31, 'Feb':28, 'Mar':31, '_____':30}) print(_____)	**2**
	Section-C (4 x 3 = 12 Marks)	
29.	Bharti received a message that she needs to update the KYC for her Bank Account therefore she should upload her Aadhar Card, Bank Account Number and the OTP on the link given in her message. Answer the following questions : (i) Is it safe for Bharti to upload her Aadhaar card, bank account number, and OTP on the link provided in the message? (ii) Why is it important for Bharti to immediately contact her bank to verify the authenticity of the message?	**3**

	(iii) What type of cyber crime is being committed in the message Bharti received, where she is asked to upload sensitive information?	
30.	**(A).** Write a Python program to create the following DataFrame (Student). 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.	**3**
31.	I. Write an SQL statement to create a table named **Employee**, with the following specifications: II. Write SQL Query to insert the following data in the Employee able 1001, Rajesh, Sales, 2024-12-10, 75000	**3**
32.	Consider the following Tables:	**3**

	Name	English	Maths	Physics
0	aparna	80	70	50
1	pankaj	78	18	48
2	sudhir	59	59	69
3	Aditya	76	66	96

Virat Kohli	Ckricket
Neeraj Chopra	javelin throw
Mary Kom	Boxing

Column Name	**Data Type**	**Key**
Emp_ID	Integer	Primary Key
Emp_Name	Varchar(20)	Not Null
Department	Varchar(15)	
Increment_Date	Date	
Salary	Int(7)	

Table ITEM:

ICode	Iname	Price
101	Television	75000
202	Computer	42000
303	Refrigerator	90000
404	Washing Machine	27000

Table BRAND:

ICode	Brand
101	Sony
202	HP
303	LG
404	IFB

Write appropriate SQL queries for the following:

1. Display the ICode, Iname and corresponding brand of those items, whose price is between 20000 and 45000 (both inclusive).
2. Display the three characters of Iname in Upper Letter.
3. To increase the price of all the items by 20%.

OR

Table : EMPLOYEE

EMPLOYEEID	NAME	SALES	JOBID
E1	SAMIT SINHA	1100000	102
E2	VIJAY SINGH TOMAR	1300000	101
E3	AJAY RAJPAL	1400000	103
E4	MOHIT RAMNANI	1250000	102
E5	SHAILJA SINGH	1450000	103

Table : JOB

JOBID	JOBTITLE	SALARY
101	President	200000
102	Vice President	125000
103	Administration Assistant	80000
104	Accounting Manager	70000
105	Accountant	65000
106	Sales Manager	80000

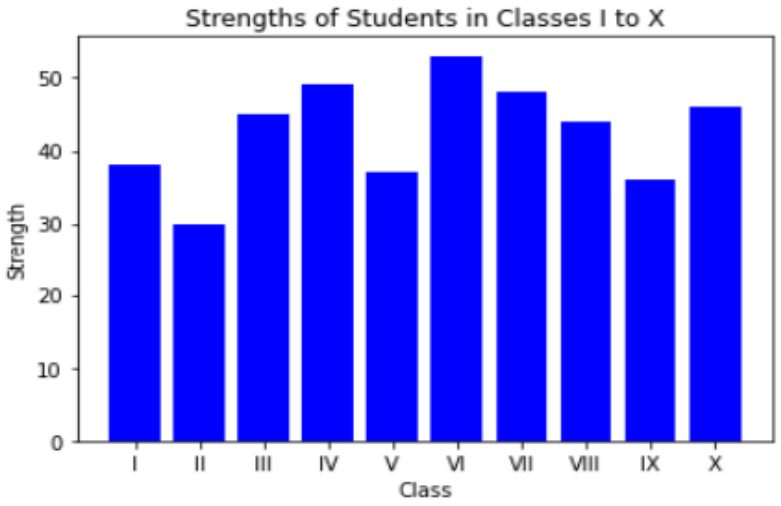
Write SQL Query for the following:

1. To display employeeid, name, Jobid, jobtitle.
2. To display highest salary and jobtitle.
3. To display sum of sales with 3 characters of name from right.

Section-D (2 x 4 = 8 Marks)

33. During a practical exam, a student Shreya has to fill in the blanks in a Python program that generates a BAR chart. This Bar chart represents the strength of students of class I to X. **4**

Class	Strength
I	38
II	30
III	45
IV	49
V	37
VI	53
VII	48
VIII	44
IX	36
X	46



Help Shreya to complete the code:

```
import _____ as plt                                  # Statement-1
classes = ['I','II','III','IV','V','VI','VII','VIII','IX','X']
strength = [38,30,45,49,37,53,48,44,36,46]
plt.bar(classes,_____,color='blue')                  # Statement-2
plt.title('Strengths of Students in Classes I to X')
plt._____('Class')                                   #Statement-3
plt.ylabel('Strength')
plt._____                                            #Statement-4
```

34. 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: **4**

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

Write SQL queries for the followings:

I Write SQL query to display book titles in uppercase.

II Write SQL query to display the lowest 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.

OR

Harshit, who works as a database designer, has developed a database for a Airline. This database includes a table FLIGHT whose column(attribute) names are mentioned below:

FLCode: Shows the Flight Code

Start : Shows the starting place

Destination: Shows the destination place

No_Stops: indicates the number of stops

No_Flights: indicates the number of flights.

Table : FLIGHT

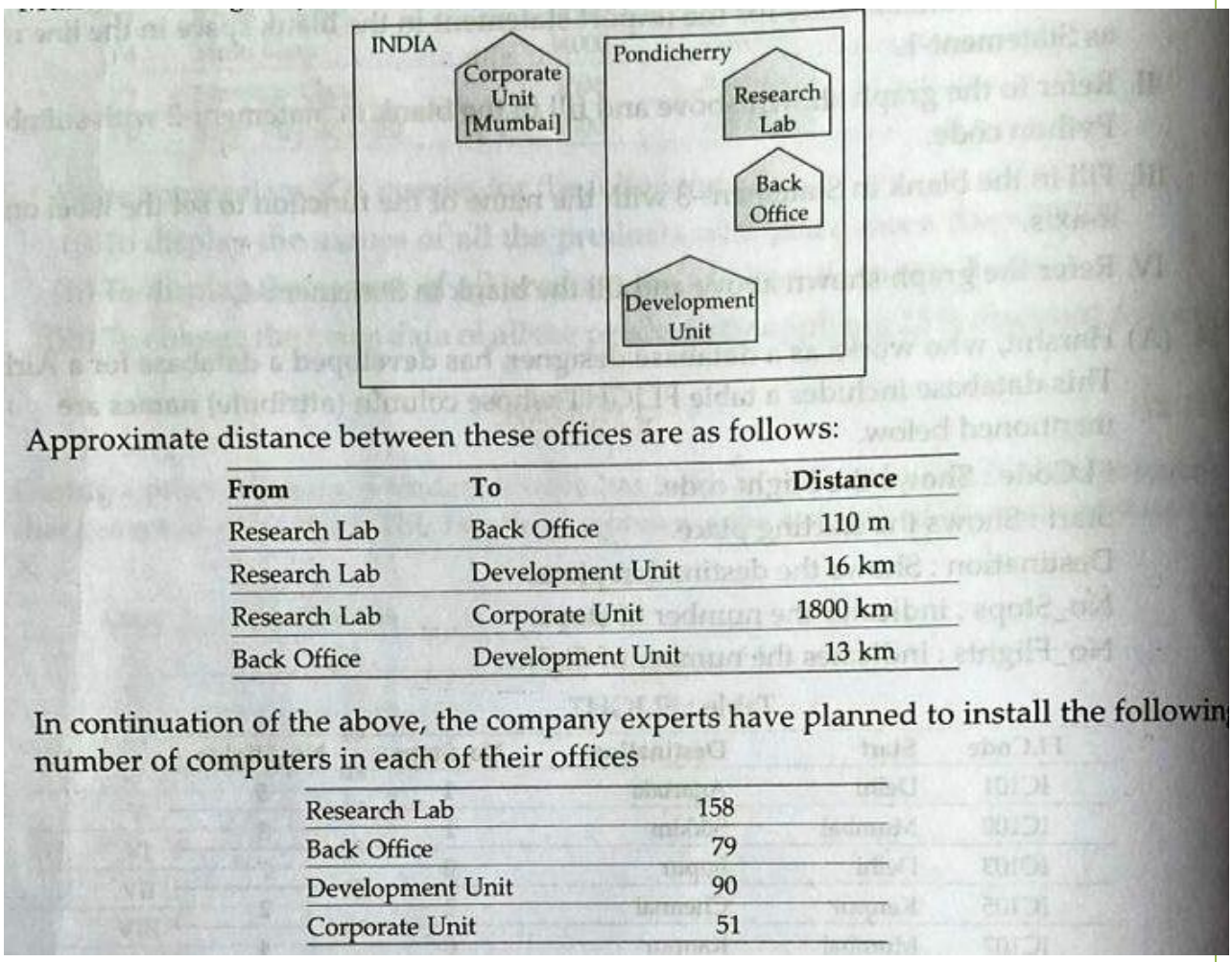
FLCode	Start	Destination	No_Stops	No_Flights
IC101	Delhi	Agartala	1	5
IC102	Mumbai	Sikkim	1	3
IC103	Delhi	Jaipur	0	7
IC105	Kanpur	Chennai	2	2
IC107	Mumbai	Kanpur	0	4
IC431	Indore	Chennai	3	2
IC121	Delhi	Ahmedabad	2	6

Predict the output of the following queries based on above table:

1. SELECT UCASE(Start) FROM FLIGHT WHERE No_Stops>2;
2. SELECT MID(Destination,1,3) FROM FLIGHT WHERE No_Flight>6;
3. SELECT SUM(No_Stops) FROM FLIGHT;
4. SELECT MAX(No_Flights) FROM FLIGHT;

Section-E (3 x 5 = 15 Marks)

35. BM technology is planning to expand their network in India, starting with three cities in India to build infrastructure for research and development of their chemical products. The company has planned to set up their main office in Pondicherry at three different locations and have named their offices as Back Office, Research Lab and Development Unit. The company has one more research office namely Corporate Unit in Mumbai. A rough layout of the same is as follows: **5**



Approximate distance between these offices are as follows:

From	To	Distance
Research Lab	Back Office	110 m
Research Lab	Development Unit	16 km
Research Lab	Corporate Unit	1800 km
Back Office	Development Unit	13 km

In continuation of the above, the company experts have planned to install the followin number of computers in each of their offices

Research Lab	158
Back Office	79
Development Unit	90
Corporate Unit	51

Based on above data answer the following questions:

1. Suggest the type of network required (out of LAN/MAN/WAN) for connecting each of the following office units.
   a. Research Lab and Back Office
   b. Research Lab and Development Office.

2. Which one of the following device, will you suggest for connecting all the computers with in each of their office units?

   a. Switch/Hub b. Modem c. Telephone

3. Company is planning to get its website designed which will allow students to see which will allow students to see their results after registering themselves on its server. Out of the static or dynamic which type of website will you suggest?
4. Suggest a cable layout for connecting the company's local office units located in Pondicherry. Also, suggest an effective method/technology for connecting the company's office unit located in Mumbai.
5. Which building is suitable to install the server? Justify the answer.

36. Consider a set of information for an Exam conducted for students with following details: **5**

Names	Marks	Trails	Passed
Sanya	95	2	yes
Krish	70	3	no
Rishav	96.5	1	yes
Deepak	75	2	no
Kriti	92	1	yes

Based on the above data(DataFrame(DF)), write the single line statements for each of the following parts, which use Pandas method:

1. To display the Names and Marks columns from the DataFrame.
2. To change the Marks in the 4^{th} row to 94.5
3. To display the rows where number of Trials in the examination is less than 2.
4. To display the maximum value of the column Marks.
5. Rename the column name Trails to Attempt.

37. **Write suitable SQL queries for the following:** **5**

a. To display the minimum price from the price column the products table.
b. To display the first four characters of the Order_id column in the Orders table.
c. To display the data from email column in the Customers table in the Reviews table.
d. To display the average value in the rating column in the Reviews table.
e. To determine the number of rows in the Transactions table.

	OR **Write suitable SQL query for the following:** a. Round the value of 7.89234 to three decimal places. b. Calculate the remainder when 320 is divided by 15. c. Display the number of characters in the word 'Electronics'. d. Display the first 7 characters from the word "Informatics Practices'. e. Display details from the address column in the Employees table after removing any leading and trailing spaces from it.	

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