CLASS: XII   **MAX MARKS: 70**

DATE: 21/09/2023   **TIME: 3 HOURS**

GENERAL INSTRUCTIONS:

1. This question paper contains five sections, Section A to E.
2. All questions are compulsory.
3. Section A has 18 questions carrying 01 mark each.
4. Section B has 07 Very Short Answer type questions carrying 02 marks each.
5. Section C has 05 Short Answer type questions carrying 03 marks each.
6. Section D has 02 Long Answer type questions carrying 04 marks each.
7. Section E has 03 questions carrying 05 marks each.
8. All programming questions are to be answered using Python Language only.

SECTION A

1. Which command in SQL is used to open a database named **db**?   1

2. Find the output of the following SQL command: 1

   SELECT CHAR('73.5',111,83.6) Result;

3. To change the width of the bars in a horizontal bar chart, which of the following argument is used?   1

   i. width   ii. hwidth   iii. height   iv. barwidth

4. If a column "Mark" in STUDENT table contains the following data: 1

Mark
15
NULL
20
17

   Predict the output of the following command:

   SELECT AVG(MARK) FROM STUDENT;

   i. 17.3   ii. 52   iii. NULL   iv. 13

5. Which keyword will you use in the following query to display all the values of the column dept_name?

   SELECT _____ DEPT_NAME FROM COMPANY;   1

   i. ALL   ii. *   iii. DISTINCT   iv. FROM

6. Identify the correct option to select first four rows and second to fourth columns from a Dataframe **df** . 1

   i. df.iloc[1:4,2:4]   ii. df.iloc[1:5,2:5]   iii. df.iloc[0:4,1:4]   iv. df.iloc[0:4,1:5]

7. Which operator can take wild card characters for query condition?   1

   i. BETWEEN   ii. LIKE   iii. IN   iv. NOT

8. Which of the following parameters of the read_csv function is used to make one of the columns

of the data in the csv file as index of the Dataframe? 1

    i. skiprows   ii. index_row   iii. index_cols   iv. index_col

9. While creating a table, when a column is declared with data type and size as: FLOAT (15,5),

    how many maximum number of digits can be present to the left of the decimal point? 1

10. If a column "CITY" contains the data set (CHENNAI, MUMBAI, KOLKATA, CHENNAI, KOLKATA), what

    will be the output after the execution of the given query? 1

    SELECT COUNT(DISTINCT CITY) FROM CUSTOMER;

    i. 4   ii. 5   iii. 3   iv. 2

11. Assume a dataframe **df1** is created using the following command: 1

    df1=pd.DataFrame({'a':[10,20], 'b':[20,30] , 'c':[30,40] })

    What error will the following command generate? print(df1['d'])

    i. Runtime Error   ii. Index Error   iii. Name Error   iv. Key Error

12. What is the meaning of "HAVING" clause in SELECT query? 1

    i. To filter out the summary groups   ii. To filter out the column groups

    iii. To filter out the row and column values   iv. All the above

13. Join in RDBMS refers to _____. 1

    i. Combination of multiple columns   ii. Combination of multiple rows

    iii. Combination of multiple tables   iv. Combination of multiple databases

14. Consider the following Series in Python:

    data=pd.Series([5,2,3,7], index=['a','b','c','d'])

    Which statement will display all odd values? 1

    i. print(data%2==0)   ii. print(data(data%2!=0))

    iii. print(data mod 2 !=0)   iv. print(data[data%2!=0])

15. Assuming the given Series named as **empl**, which command will be used to print ['A', 'B', 'C'] as

    output? 1

```
A        Anuj
B        Riya
C     Jayesh
dtype: object
```

    i. empl.index   ii. empl.labels   iii. empl.values   iv. empl.size

16. Which among the following is not an aggregate function? 1

    i. Max   ii. Sum   iii. Average   iv. Count

Q17 and 18 are ASSERTION AND REASONING based questions. Mark the correct choice as:

    i.   Both A and R are true and R is the correct explanation for A

    ii.   Both A and R are true and R is not the correct explanation for A

    iii. A is true but R is false

    iv. A is false but R is true

17. **ASSERTION (A):** A bar graph shows comparisons among discrete categories.

    REASONING (R): One axis of the chart shows the specific categories being compared. 1

18. **ASSERTION(A):** Sorting is the operation to arrange data in a specific order, sort_values( ) function is used to perform the same.

    REASONING(R): Row wise sorting cannot be performed in python dataframe objects.   1

SECTION B

19. What is the difference between at() and iat() with respect to a dataframe?   2

20. The Python code written below has syntactical errors. Rewrite the correct code and underline the corrections made.   2

```
import pandas as pd, numpy as np
d ={"Technology":["Programming",NaN,
      "3D Printing'] ,"Time (in months)": [4,4,3]}
df= pd.Dataframe(d)
print(Df)
```

21. Write code to create the given dataframe **Countries** using dictionary of list.   2

	Capital	Population
Australia	Canberra	25
Germany	Berlin	84
France	Paris	68
Canada	Ottawa	38
Spain	Madrid	48

22. Predict the output of the given Python code: 2

```
import pandas as pd
import numpy as np
x=(-10,-20,np.NaN)
ser = pd.Series(x*2)
print(ser)
```

23. What is the difference between the group by and order by clause when used along with the select statement? Explain with an example.   2

24. i) Complete the given Python code to arrange the Series in descending order of their values.   2

```
import pandas as pd
data = {'a': 26, 'b': 32, 'c': 22}
s1 = pd.Series(data)
print(_____)
```

  ii) Write the command to name the series as **SER1**.

25. Given a Dataframe **GDP**, which shows the GDP growth of four countries from 2018-2020.   2

	2018	2019	2020
INDIA	3.5	2.7	5.2
INDONESIA	2.6	2.8	4.1
AUSTRALIA	4.4	3.7	6.2
MALAYSIA	1.5	2.6	3.6

Write the output of the following statements based on the above Dataframe:

  i. print(GDP[[2018,2019]])

ii. print(GDP[2020]*2)

<div align="center">SECTION C</div>

26. Based on the SQL table CARMARKET, write suitable queries for the following: 3

Table : CARMARKET

CCODE	CARNAME	COMPANY	TYPE	COST	DOM
C01	A3	Audi	Convertible	50000.000	2019-11-07
C02	Scorpio	Mahindra	SUV	15000.500	2020-10-15
C03	Mustang	Ford	Coupe	25000.000	2020-01-20
C04	Null	Mahindra	SUV	Null	2018-12-29
C05	R8	Audi	Coupe	30000.000	2020-09-01

  i. Increase the cost of SUVs by 5% of their current cost.

  ii. Delete the details of Audi cars manufactured before 2020.

  iii. Change the column name Company of datatype varchar(10) to Dealer.

<div align="center">**OR**</div>

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

  i. SELECT ROUND(COST) FROM CARMARKET WHERE CARNAME IS NOT NULL;

  ii. SELECT MOD(LENGTH(COMPANY), MONTH(DOM)) VALUE FROM CARMARKET
     WHERE COST BETWEEN 15000 AND 25000;

  iii. SELECT LCASE(MID(CARNAME,3,-2)) FROM CARMARKET WHERE COST=25000;

27. Write MySQL statements for the following: 3

  i.   To create a table named NUTRIENTS based on the following specification:

Column Name	Data Type	Constraints
Food_item	Varchar(20)	Primary key
Total_fat	float(5,2)	
Cholesterol	integer	Not null

  ii.   To remove the primary key constraint from table NUTRIENTS.

28.   Consider the table CABHUB and CUSTOMER.   3

<div align="center">**Table: CABHUB**</div>

Vcode	VehicleName	Make	Color	Capacity	Charges
100	Innova	Toyota	WHITE	7	15
102	SX4	Suzuki	BLUE	4	14
104	C Class	Mercedes	RED	4	35
105	A-Star	Suzuki	WHITE	3	14
108	Indigo	Tata	SILVER	3	12

Table: CUSTOMER

Ccode	Cname	Vcode
1	Hemant Sahu	100
2	Raj Lal	108
3	Feroza Shah	105
4	Ketan Dhal	104

<div align="center">4</div>

Answer the following questions:

i. What will be the degree and cardinality of the Cartesian product of CABHUB and CUSTOMER tables?

ii. Identify the foreign key in the above relation. Justify your answer.

iii. Write the output of:

    SELECT CName, VehicleName FROM CUSTOMER, CABHUB
    WHERE CUSTOMER.Vcode=CABHUB.Vcode;

29. Consider the following code and write its output: 3

    import pandas as pd
    dict={'2020':{'Q1':125,'Q2':230,'Q3':275}, '2021':{'Q1':105,'Q2':130,'Q3':145}}
    df=pd.DataFrame(dict)
    for i,j in df.iterrows():
        print(i,'\n',j)

30. Consider the following DataFrame **Student** :   3

	Rollno	Name	Marks	Stream
S1	1	Sourabh	87	Science
S2	2	Preet	89	Arts
S3	3	Kumar	95	Science
S4	4	Laksh	94	Commerce

Write suitable Python statements for the following:

i. Add a column 'Class' with value 'XII' between name and marks column.

ii. Display the details of Science stream students.

iii. Change the column Marks to Score.

SECTION D

31. A Gift Gallery has different stores in India. Database administrator Abhay wants to maintain the database of their salesmen in SQL to store the data. He has decided that name of the database as **Giftgallery** and table as **Salesman**.

Consider the following records in **Salesman** table and answer the given questions: 4

Scode	Sname	Address	Salary	Area
100	Amit	Delhi	15000	East
101	Susan	Gurgaon	27000	East
102	Priya	Noida	23450	West
103	Mohit	Null	26000	North
104	Priyanshi	Delhi	28000	North

i. Help Abhay to display the name of all salesman except from the east areas of Delhi in uppercase.

ii. Display the name, Address (in lowercase) and bonus (rounded off to whole numbers) of all salesmen whose name starts with 'P'. Assume bonus is 2.5% of the salary.

iii. Write query to display the name and the address of all salesman from North and West. If the address is not mentioned replace it with a text 'Yet to decide'.

iv. Write the output: SELECT LTRIM(SNAME) FROM SALESMAN ORDER BY AREA DESC, ADDRESS ASC;

32. Zenat has created the following dataframe **Df1** to keep track of data Rollno, Name, Term1 and
    Term2 marks for various students of her class where row indexes are taken as the default values: 4

Rno	Name	Term1	Term2
1	Swapnil Sharma	30	50
2	Raj Batra	75	45
3	Bhoomi Singh	82	NaN
4	Jay Batra	90	95

Answer the following questions:

i. Which command will display the following output?

```
Rno    4
Name   4
Term1  4
Term2  3
dtype: int64
```

ii. Write commands to display the name of students whose Term1 marks are in the range of 80 to 90.

iii. Write command to delete the 3rd column using del keyword. Also, define the del keyword.

OR

(Option for part iii only)

Write Python statement to export the above Dataframe to a CSV file named **Data.csv** stored
at D: drive along with NaN values stored as Null and separator as ' ~ ' .


SECTION E

33. Neeraj manages a database for his new start-up. For business purposes, he created a table named
    MASTERFILE. Assist him by writing the following queries to display: 5

    Table: MASTERFILE

Id	Prod_name	country	Prod_category	Price
A89765	Mouse	Taiwan	Input	345
G34567	Monitor	India	Output	650
S23453	USB	USA	Storage	200
K92761	KeyBoard	India	Input	540
J1234	HDD	Taiwan	Storage	100

i. The total cost of products manufactured by each country.

ii. The country wise highest price for products with price greater than or equal to 500.

iii. The lowest price among the input and output category products.

iv. The first 2 characters of product name joined with their country (in capitals) of all products whose
    product name starts with "M".

v. The countries that manufactures at least two categories of products in descending order of country
    names.

6

34. Write code to plot the following bar graph representing the total number of medals won by India.   5
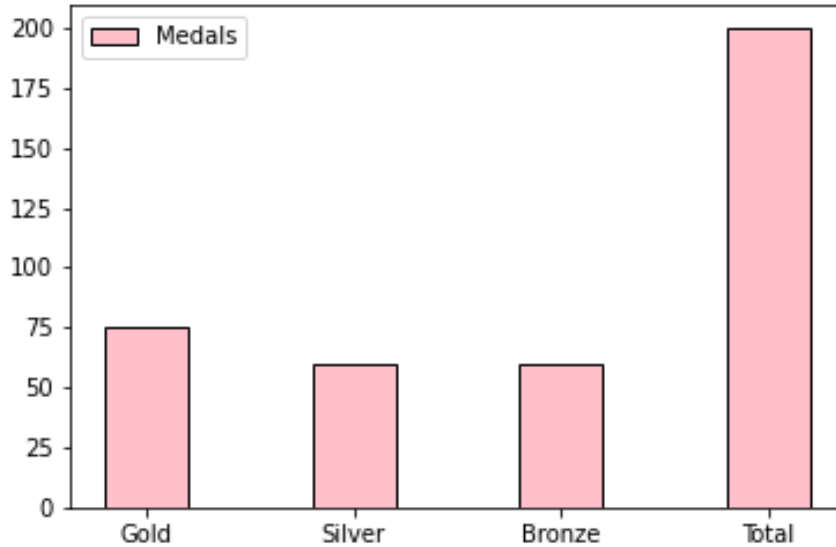
Give appropriate label, title, colour and a black border to the edge of the bars. Also give suitable Python statement to save this chart.

OR

The dataframe **Test** given below shows the Marks of two students for the four unit tests for the academic session 2022-2023. Write the code to draw a dotted line graph with Test names on the X axis and Marks on the Y axis.

	Rohit	Suman
Unit1	85	97
Unit2	88	99
Unit3	89	90
Unit4	87	92

Also give appropriate title, label and markers to the chart.

35. Write suitable SQL query for the following: 5
    i. Display the number of characters present in the string 'INFORMATICS PRACTICES'
    ii. Remove the character 'S' from the end of the string 'INFORMATICS PRACTICES'.
    iii. Display the position of the first occurrence of the substring "TIC" in 'INFORMATICS PRACTICES'.
    iv. Compute the power of a number n1 raised to the power n.
    v. Extract 2-digit year from a string 'USS/23/67/09'. The last two character shows the year.

OR

Explain the following SQL functions using suitable examples.
    i.   TRUNCATE()
    ii.   TRIM()
    iii. DATE()
    iv. DAY()
    v.   NOW()

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