Time: 3 Hours   **MM: 70**

General Instructions:

- **This question paper contains five sections, Section A to E.**
- **All questions are compulsory.**
- **Section A have 18 questions carrying 01 mark each.**
- **Section B has 07 Very Short Answer type questions carrying 02 marks each.**
- **Section C has 05 Short Answer type questions carrying 03 marks each.**
- **Section D has 02 questions carrying 04 marks each.**
- **Section E has 03 Long Answer type questions carrying 05 marks each.**

SECTION –A

Q1) To change the 5th column's value at 3rd row as 35 in dataframe DF, you can write

   a) DF.iat[3, 5] = 35   b) DF[4, 6] = 35   c) DF[3, 5] = 35   d) DF.iat[4, 6] = 35

   Predict the output of the following query: SELECT MOD (9,2);

Q2: Labelled indexing is possible in:

   a) Series   b) DataFrame   c) Both a and b   d) only b

Q3) Write the output of the following code:

   SELECT INSTR("LEGAL TERM OF SOCIAL ACTIVITIES", "AL");

   a) 4   b) 19   c) 18   d) error

Q4) In SQL, the equivalent of UCASE () is:

   a) UPPERCASE ()   b) CAPITALCASE()   c) UPPER()   d) TITLE()

Q5) Which method is used to display line plot?

   a) show()   b) execute()   c) plot()   d) display()

Q6) Predict the output of the following query:

   SELECT LCASE (MONTHNAME ('2023-03-05'));

Q7) What will be the output of the given code?

```
import pandas as pd
s=pd.Series([1,2,3,4,5],
s.index=['akram','brijesh','charu','deepika','era'])
print(s['charu'])
```

Q8) By default, ORDER BY clause lists the results in _____ order.

   a) Same   b) Any   c) Descending   d) Ascending

Q9) Which of the following SQL functions does not belong to the Math functions category?

   a) POWER()   b) ROUND()   c) LENGTH()   d) MOD()

Q10) What is the output of the following code:

   SELECT LCASE (MONTHNAME ('2023-09-10'));

   a) September   b) september   c) october   d) October

Q11) In Python Pandas, while performing mathematical operations on series, index matching is implemented and all missing values are filled in with _____.

   a) Missing   b) NAN   c) NaN   d) 0

Q12) With reference to SQL, identify the invalid data type.

   a) date   b) integer   c) double   d) month

Q13) Ritika is a new learner for the python pandas, and she is aware of some concepts of python. She has created some lists, but is unable to create the data frame from the same. Help her by identifying the statement which will create the data frame.

```
import pandas as pd
Name=['Manpreet','Kavil','Manu','Ria']
Phy=[70,60,76,89]
Chem=[30,70,50,65]
```

   a) df=pd.DataFrame({"Name":Name,"Phy":Phy,"Chem":Chem})

   b) d=("Name":Name,"Phy":Phy,"Chem":Chem)
      df=pd.DataFrame(d)

   c) df=pd.DataFrame([Name,Phy,Chem],columns=['Name',"Phy","Chem","Total"])

   d) df=pd.DataFrame({Name:"Name", Phy :"Phy",Chem: "Chem"})

Q14) Which of the following command will show the last 3 rows from a Pandas Series named NP?

   a) NP.Tail( )   b) NP.tail(3)   c) NP.TAIL(3)   d) All of the above

Q15) CSV stands for:

a) Column Separated Value   b) Class Separated Value   c) Comma Separated Value   d) None of the above

Q16: Which library must be imported before using the visualation i Python?

a) import matplotlib.pyplot as plt   b) import matplotlib.Pyplot as plt

c) Import matplotlib.pyplot as plt   d) All of these are correct

Q17 and 18 are ASSERTION AND REASONING 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

Q17) Assertion (A): -: pandas is an open-source Python library which offers high performance, easy-to-use data structures and data analysis tools.

Reasoning (R): - Professionals and developers are using the pandas library in data science and machine learning.

Q18) Assertion (A): - Data visualization refers to the graphical representation of information and data using visual elements like charts, graphs, and maps etc.

Reasoning (R): - To install matplotlib library we can use the command

pip install matplotlib.

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SECTION-B

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Q19) Write the output of the following code:

```
import pandas as pd list1=[-10,-20,-30]
ser = pd.Series(list1*2)
print(ser)
```

Q20) The python code written below has syntax errors. Rewrite the correct code and underline the corrections made. Import pandas as pd

```
df ={"Technology":["Programming","Robotics","3DPrinting"],"Time(in months)":[4,4,3]}
df= Pd.dataframe(df)
Print(df)
```

Q21) Aryan, a database administrator, has grouped records of a table with the help of group by clause. He needs to further filter groups of records generated through group by clause. Suggest suitable clause for it and properly explain its usage with the help of an example.

Q22) Create a DataFrame in Python from the given list:

[['Divya','HR',95000],['Mamta','Marketing',97000],['Payal','IT',980000], ['Deepak','Sales',79000]] Also   give appropriate column headings.
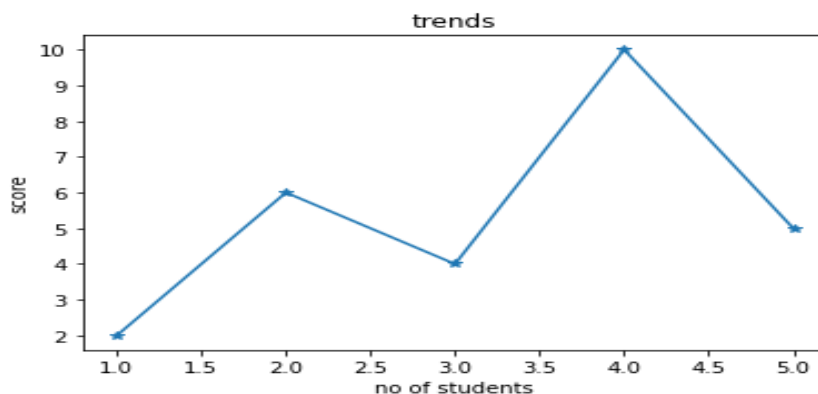
Q23) Complete the given Python code to get the required output as: **Rajasthan**

```
import _____ as pd
di = {'Corbett': 'Uttarakhand', 'Sariska': 'Rajasthan', 'Kanha': 'Madhya Pradesh', 'Gir':'Gujarat'}
NP = _____. Series( _____ )
print(NP[ _____ ])
```

Q24) Find the output of the following code: -

```
Stationery = ['pencils', 'notebooks', 'scales', 'erasers']
S = pd. Series ([20, 33, 52, 10], index = Stationery)
S2 = pd. Series ([17, 13, 31, 32], index = Stationery)
S = S + S2
print (S + S2)
print (S + S2)
S[0:2] = 12
print(S)
```

Q25) Write a code to plot a following line chart to display the same output as shown below:

Note: (i) Marker style should be star sign, colour of line should be red and thickness of line should be points.
   (ii) Title of chart is **trends**, x axis label is **no of students**, y axis label is **score**.

SECTION-C

Q26) Predict the output of the following queries:
   a) select left('INDIAN FORCES',4);
   b) select substr("EK BHARAT SHRESHTH BHARAT",7,4);
   c) select Len(substr('CBSE EXAM',-4));

Q27) Define Join, Cartesian product and equi join.

Q28) Consider the table Patient given below and write SQL commands.

Table : Patient

Patientid	Name	City	Phone	Dateofadm	Department
1000001	Ritvik Gar	Delhi	68476213	2021-12-10	Surgery
1000002	Rahil Arora	Mumbai	36546321	2022-01-08	Medicine
1000003	Mehak Bhatt	Delhi	68421879	2022-02-02	Cardiology
1000004	Soumik Rao	Delhi	26543266	2022-01-11	Medicine
1000005	Suresh Sood	Bengaluru	65432442	2021-03-09	Surgery

   (i) Display the details of all patients who were admitted in January.
   (ii) Count the total number of patients from Delhi.
   (iii) Display the last 2 digits of the Patient id of all patients from Surgery Department.

Q29) What is the need of data visualization in Python, What are the different methods of data visualization in python.

Q30) Write MySQL statements for the following:
   a) To create a database named FOOD.
   b) To create a table named Nutrients based on the following specification:

Column Name	Data Type	Constraints
Food_Item	Varchar(20)	Primary Key
Calorie	Integer	Not null

SECTION-D

Q31) Consider a table PRODUCT with the following data :

Table : PRODUCT

SNO	Itemname	Company	Stockdate	Price	Discount
1	Monitor	HCL	2021-12-20	15499.739	15
2	Webcam	Logitech	2020-02-03	4890.90	5
3	Keyboard	Logitech	2022-08-19	1878.985	30
4	Mouse	HCL	2021-05-16	1200.00	7
5	Speakers	iBa11	2021-10-19	NULL	25

Write SQL queries using SQL functions to perform the following operations :
   (i) Display the first 3 characters of all Itemnames.
   (ii) Display the names of all items whose Stockday is "Monday".
   (iii) Display the total price of all the products.
   (iv) Display the average Price of all the products by the company named 'Logitech'.

Q32) Ekam, a Data Analyst with a multinational brand has designed the Data Frame **df** that contains the four quarter's sales data of different stores as shown below:

	STORE	Qtr1	Qtr2	Qtr3	Qtr4
0	STORE1	300	240	450	230
1	STORE2	350	340	403	210
2	STORE3	250	180	145	160
3	STORE4	140	130	150	180

Answer the following questions:
   a) Predict the output of the following python statement:
       i.   print(df.size)   ii. print(df[1:3])
   b) Delete the last row from the DataFrame.
   c) Write Python statement to add a new column **Total_Sales** which is the addition of all the 4 quarter sales.

OR

(Option for part c only)

Write Python statement to export the DataFrame to a CSV file named **data.csv.**

SECTION-E

Q33) Why is the following code not renaming the index and columns even when code is executing without any error, considering that the **saleDf** dataframe is as shown on the right. >>> saleDf

	Target	Sales
Zone B	70000	68000
Zone C	75000	78000
Zone D	60000	61000

The code:

saleDf.rename(index = {'zoneC': 'Central', 'zoneD': 'Dakshin'}, columns = {'Target': 'Targeted', 'Sales': 'Achieved'})
print(saleDf)

What output would be produced by the above code and what is the problem with the code? What correction/modification would you suggest for the problem. Explain briefly.

Q34) Write the SQL functions which will perform the following operations:
   a) To display the name of the weekday for your date of birth
   b) To convert e-mail-id to lowercase
   c) To count the number of characters in your name
   d) To display the first character of your name
   e) To calculate the average marks secured by the class

Q35: Kabir has created following table named **exam:**

RegNo	Name	Subject	Marks
1	Sanya	CS	98
2	Sanchay	IP	100
3	Vinesh	CS	56
5	Akshita	IP	98

Help him in writing SQL queries to the perform the following task:
   a) Insert a new record in the table having following values:
       [6,'Khushi','CS',85]
   b) To change the value "IP" to "Informatics Practices" in subject column.
   c) To remove the records of those students whose marks are less than 30.
   d) To add a new column Grade of suitable datatype.
   e) To display records of "Informatics Practices" subject.