

SAMPLE PAPER - 2023-24

General Instruction:

1. This question paper contains five sections, Section A to E.
2. All questions are compulsory.
3. Section A have 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 questions carrying 04 marks each.
7. Section E has 03 questions carrying 05 marks each.

All programming questions are to be answered using Python Language only

SECTION A(18 MARKS)

- Q1. Which of the following command will show the last 3 rows from a Pandas Series named NP? 1
i. NP.Tail() ii. **NP.tail(3)** iii. NP.TAIL(3) iv. All of the above
- Q2. With reference to SQL, identify the invalid data type. 1
i. Date ii. Integer iii. Varchar iv. **Month**
- Q3. In Python Pandas, while performing mathematical operations on series, index matching is implemented and all missing values are filled in with _____by default. 1
i. Null ii. Blank iii. **NaN** iv. Zero
- Q4. Raj, a Database Administrator, needs to display the average pay of workers from those departments which have more than five employees. He is experiencing a problem while running the following query:
SELECT DEPT, AVG(SAL) FROM EMP WHERE COUNT (*) > 5 GROUP BY DEPT;
Which of the following is a correct query to perform the given task? 1
a) SELECT DEPT, AVG(SAL) FROM EMP WHERE COUNT (*) > 5 GROUP BY DEPT;
b) SELECT DEPT, AVG(SAL) FROM EMP HAVING COUNT (*) > 5 GROUP BY DEPT;
c) SELECT DEPT, AVG(SAL) FROM EMP GROUP BY DEPT WHERE COUNT (*) > 5;
d) **SELECT DEPT, AVG(SAL) FROM EMP GROUP BY DEPT HAVING COUNT (*) > 5;**
- Q5. Predict the output of the following query: 1
SELECT LCASE (MONTHNAME ('2023-03-05')); **march**
- Q6. Which of the following can be used to specify the data while creating a DataFrame? 1
i. Series ii. List of Dictionaries iii. Structured ndarray iv. **All of these**
- Q7. Predict the output of the following query: 1
SELECT MOD (9,0);
i. 9 ii. 0 iii. **NULL** iv. None of these
- Q8. In SQL, the equivalent of UCASE () is: 1
a) UPPERCASE () b) CAPITALCASE() c) **UPPER()** d) TITLE()
- Q9. Which of the following SQL functions does not belong to the Math functions category? 1
a) POWER() b) ROUND() c) **LENGTH()** d) MOD()
- Q10. Which of the following statement will import pandas library? 1
i. Import pandas as pd ii. import Pandas as py
iii. **import pandas as pd** iv. import panda as pd
- Q11. The name "Pandas" is derived from the term: 1
a. **Panel Data** b. Panel Series c. Python Document d. Panel Data Frame
- Q12. Pandas Series is: 1

- a. **2 Dimensional** b. 3 Dimensional c. 1 Dimensional d. Multidimensional
- Q13. The command to install the pandas is: 1
a. install pip pandas b. install pandas c. pip pandas d. **pip install pandas**
- Q14. Constraints that involve multiple attributes from the table are calling----- 1
(a) Attributes based (b) **Table based**
(c) Tuple based (d) Scale based
- Q15. Out of the following, which function cannot be used for customization of charts in Python? 1
a. xlabel() b. **colour()** c. title() d. xticks()
- Q16. What is the minimum number of arguments required for plot() function in matplotlib? 1
a. 1 b. **2** c. 3 d. 4
- 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
- Q17. Assertion (A):- To use the Pandas library in a Python program, one must import it. (lii) 1
Reasoning (R): - The only alias name that can be used with the Pandas library is pd.
- Q18. Assertion (A):- DataFrame has both a row and column index. 1
Reasoning (R): - A DataFrame is a two-dimensional labelled data structure like a table of MySQL. (i)

SECTION B(14 MARKS)

- Q19. Consider the following DataFrame, Student 2

Name	Age	Marks	Place
Amit	23	88	Delhi
Binu	43	99	Mumbai
Girish	12	95	Chennai

Write commands to

(a) Add a new column 'percentage' to the dataframe with a scalar value.

Student['percentage']=[98,97]

(b) Add a new row with values of your choice.

Student[len(Student)]=['abc',23,88,'Mumbai']

OR

Given here is a Dataframe of Sales data of four months stored with name **sales_df**.

	April	May	June	July
Delhi	75	90	54	67
Mumbai	78	65	87	84
Kolkata	84	79	92	79
Chennai	65	78	94	90

- Write a Python code to remove the Sales of July month.
Del Student['July']
- Write a Python code to add the sales of August month with [70,94,80,93] data.

Student['August']=[84,78,95,77]

- Q20. Rashmi, a database administrator needs to display house wise total number of records of 'Red' and 'Yellow' house. She is encountering an error while executing the following query: 2

**SELECT HOUSE, COUNT (*) FROM STUDENT GROUP BY HOUSE
WHERE HOUSE='RED' OR HOUSE= 'YELLOW';**

Help her in identifying the reason of the error and write the correct query by suggesting the possible correction (s).

**SELECT HOUSE, COUNT (*) FROM STUDENT GROUP BY HOUSE
having HOUSE='RED' OR HOUSE= 'YELLOW'**

- Q21. What is the purpose of Order By clause in SQL? Explain with the help of suitable example 2

- Q22. Consider the following Series : Subject 2

Write A program in Python Pandas to create a Series.

INDEX	MARK
ENGLISH	75
HINDI	78
MATHS	82
SCIENCE	86

- Q23. Write a Python code to create a DataFrame with appropriate column headings from the list given below: 2

[[101,'Gurman',98],[102,'Rajveer',95],[103,'Samar',96],[104,'Yuvraj',88]]

OR

Gaytri, a data analyst has stored four employee's name and their employee code in four dictionaries. Structure of one such dictionary is as follows:

Emp1={'Ename': 'Emp Name', 'Ecode':Employee code}

She clubbed these four dictionary into a list.

Write suitable Python code to store the required data of four employees in the form of list of dictionaries and create a DataFrame with appropriate column headings as shown below:

	Ename	ECode
0	John	88
1	Emily	92
2	Michael	78
3	Sophia	95

- Q24. What will be the output of the following code: 2

```
>>>import pandas as pd
>>>A=pd.Series(data=[35,45,55,40])
>>>print(A<45)
```

- Q25. Carefully observe the following code: 2

```
import pandas as pd
Year1={'Q1':5000,'Q2':8000,'Q3':12000,'Q4': 18000}
Year2={'A' :13000,'B':14000,'C':12000}
totSales={1:Year1,2:Year2}
df=pd.DataFrame(totSales)
print(df)
```

Answer the following:

- List the index of the DataFrame df
- List the column names of DataFrame df

SECTION C - 15 MARKS

Q26. Consider the following records in 'Cars' table and answer the given questions:

3

CarID	Make	Model	Year	Color	Price
101	Toyota	Camry	2022	Blue	25000.00
102	Honda	Civic	2021	Black	22000.00
103	Ford	Mustang	2023	Brown	35000.00
104	Chevrolet	Equinox	2022	White	28000.00
105	BMW	X5	2023	Blue	45000.00
106	Volkswagon	Golf	2021	Black	20000.00

i) Write SQL query that will give the output as:

Blu
Bla
Bro
Blu

Select left(Color,3);

ii) Write command for the following:

To change the color of Model with code as 103 to 'Green'.

Update cars set color='Green' where carid=103

iii) How many tuples are present in the cars table?

Also identify the most suitable column of the cars table to mark as primary key column.

6 tuples, CarId : Primary Key Column

Q27. Write a program in python Pandas to create the following DataFrame Student from a Dictionary.

3

Name	Age	Marks	Place
Amit	23	88	Delhi
Binu	43	99	Mumbai
Girish	12	95	Chennai

i. Display the Name(s) whose the age > 15

ii. Delete the column 'place' permanently.

Student[Student['Age']>15]['Name']

del Student['place']

Display the contents of the dataframe

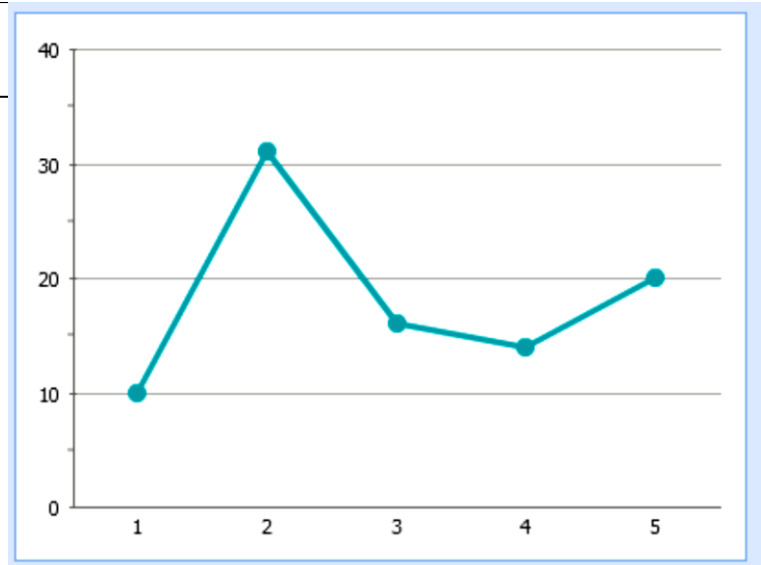
print(Student)

Q28. Consider the following graph. Write the code to plot it.

3

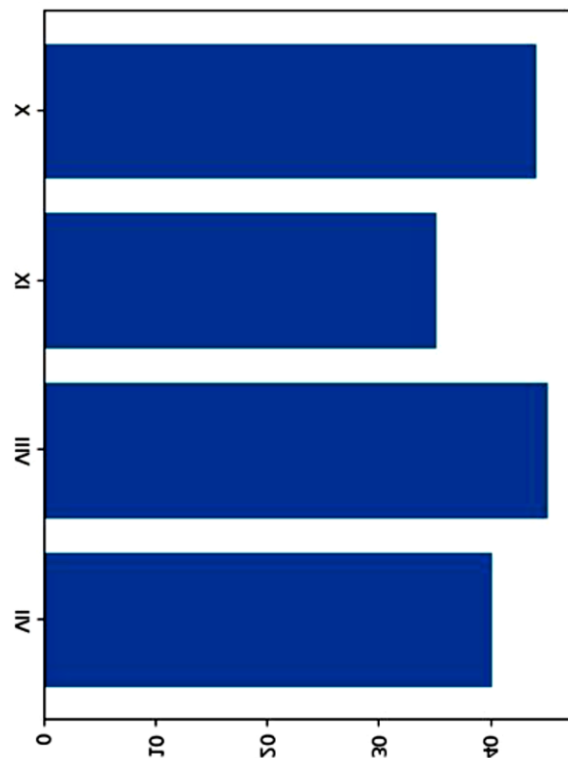
```
X=[1,2,3,4,5]
Y=[10,30,15,12,20]
```

OR



Write code to draw the following bar graph representing the number of students in each class

```
X=['VII','VIII','IX','X']
Y=[0,10,20,30,40]
plt.barh(X,Y)
```



Q29. Consider the given DataFrame 'Employees':

Name	Employee_ID	Department
Alice	EMP001	HR
Bob	EMP002	Sales
Carol	EMP003	IT
David	EMP004	Marketing

Write suitable Python statements for the following operations:

i) Add a column called 'Salary' with the following data:

[55000, 60000, 65000, 58000].

ii) Include a new employee named 'Eve' with Employee_ID 'EMP005', working in the 'Finance' department, and a salary of 62000.

iii) Change the name of the 'Employee_ID' column to 'ID'.**OR** Series

Q30. Consider a table **Teacher** that contains the following data:

3

EmpNo	FName	LName	Subject	Qualification	Salary	Post
1	Sandeep	Verma	SSt	BEd.	25409.789	TGT
2	Sonia	Kumari	Computer	BCA	21200.456	TGT
3	Nirmal	Sharma	Hindi	BEd.	38274.657	PGT
4	Sanjeev	Shastri	Sanskrit	BEd.	28782.228	TGT
5	Rakesh	Sharma	English	BEd.	32892.487	PGT

Write the SQL queries using SQL functions to perform the following operations:

- To display Teacher's first name where 'ee' occurs in the first name
- To join First Name and Last Name of the teachers with some space in between
- To display contents of Qualification field in small letters
- To display first 2 characters of the 'Subject' field
- To round off the Salary to the nearest integer
- To find the maximum salary according to post.

SECTION D - 15 MARKS

Q31. Write SQL statements for the following:

5

- Display the length of the string "Informatics Practices".
- Display the position of "My" in "Enjoying MySQL".
- Display the name of current month.
- Display system date.
- Display date after 10 days of current date.

OR

- Display the day of current date
- Display first three characters extracted from 5th right character onwards from string "VALLABH ASHRAMS"
- Convert and display string 'large' into uppercase.
- Write a query to remove leading spaces of string ' RDBMS MySQL'.
- Display the position of string 'LE ' in field job of table Empl

Q32. Consider the following Dataframe named housing_df.

Area_Type	Location	Size	Society	Total_sqft	Bath	Balcony	Price
SUPER BUILT-UP AREA	ELECTRONIC CITY PHASE II	2 BHK	COOMEE	1056	2	1	39.07
BUILT-UP AREA	UTTARAHALLI	3 BHK		1440	2	3	62
SUPER BUILT-UP AREA	LINGADHEERANAHALLI	2 BHK	SOIEWRE	1521	3	1	95
SUPER BUILT-UP AREA	WHITEFIELD	2 BHK	DUNATA	1170	2	1	51
SUPER BUILT-UP AREA	OLD AIRPORT ROAD	4 BHK	JAADES	2732	4		38
SUPER BUILT-UP AREA	KOTHANUR	2 BHK		1200	2	1	204
SUPER BUILT-UP AREA	RAJAJI NAGAR	4 BHK	BRWAY G	3300	4		600

Write a Python program to

(i) Create the above Dataframe from a csv file named housing.csv and display it. Import necessary libraries.

```
import pandas as pd
```

```
df=pd.read_csv('..housing.csv')
```

(ii) Display the houses having 2 bathrooms.

```
df1=df[df.loc['Bath']==2]['Area_Type']
```

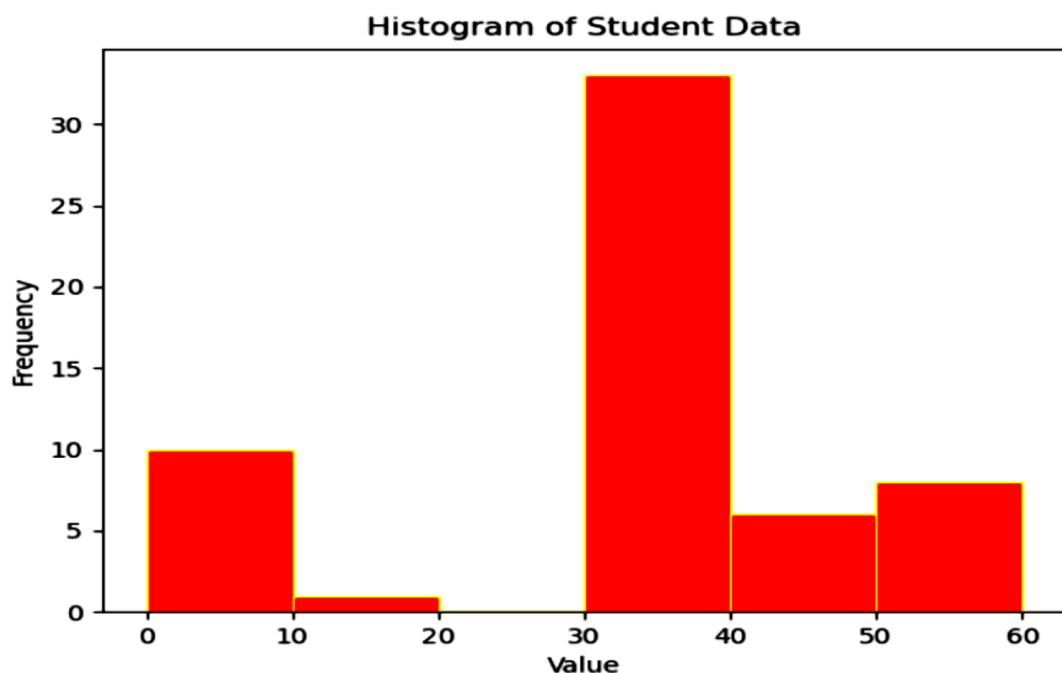
(iii) Display the price of house in lakhs. Assume the numbers in price column represent price in lakhs.

```
df['Price']
```

(iv) Display first 3 rows of the Dataframe

```
df.head(3)
```

Q33. Consider the following graph. Write a program in python to draw it. (Height of Bars are 10,1,0,33,6,8) Take care of axis label and title.



```
import matplotlib.pyplot as plt
data=[10,1,0,33,6,8]
```

```
plt.hist(data)
plt.xlabel('Value')
plt.ylabel('Frequency')
plt.show()
```

SECTION E - 8 MARKS

Q34. Carefully observe the following table named 'STATIONARY':

4

ICODE	INAME	CATEGORY	QTY	UNITPRICE	STKDATE
444	DRAWING COPY	101	110	21	31-JULY-2010
445	SHARPENER CAMLIN	102	235	3	01-AUG-2010
450	ERASER NATRAJ	101	40	2	17-AUG-2010
452	GEL PEN MONTEX	103	50	5	30-DEC-2009
457	GEOMETRY BOX	101	35	45	15-11-2009
467	PARKER PREMIUM	102	60	205	27-OCT-2009
469	OFFICE FILE	103	32	25	13-SEP-2010

Write SQL queries for the following:

(a) To display the records in decreasing order of price.

Select * from stationary order by price desc

(b) To display category and category wise total quantities of products.

Select category,sum(quantity) from stationary group by category

(c) To display the quantity and its average quantity.

Select qty,avg(qty) from stationary

(d) To display category and category wise lowest price of the product

Select category, min(price) from stationary group by category

Q35. Given the following set of data:

4

Weight measurements for 16 small orders of French-fries (in grams).

78 72 69 81 63 67 65 75

79 74 71 83 71 79 80 69

(a) Create a step type of histogram from the above data

(b) Create a cumulative histogram from the above data

```
import matplotlib.pyplot as plt
data=[78,72,69,81,63,67,65,75,79,74,71,83,71,79,80,69]
plt.hist(data, hist_type='step')
plt.hist(data, hist_type='cumulative')
plt.show()
```