



## REVISION SHEET

**SUBJECT: INFORMATICS PRACTICES**

**CLASS-X II**

**TERM 1**

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### SECTION – 1 MARK QUESTIONS (20 x 1 = 20 Marks)

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1. Which function is used to view the first n rows of a DataFrame?  
a) top() b) head() c) first() d) view()
2. What is the output?  

```
import pandas as pd  
S = pd.Series([1,2,3,4])  
print(S.dtype)
```

  
a) object b) int64 c) float64 d) series
3. Which attribute returns the number of dimensions of a DataFrame?  
a) shape b) size c) ndim d) dim
4. Which method is used to check for missing (NaN) values in a DataFrame?  
a) isnull() b) isna() c) both a and b d) checkna()
5. Which of the following is used to sort a DataFrame by its index?  
a) sort\_values() b) sort\_index() c) sort() d) order\_by()
6. In Pandas, which function is used to concatenate two DataFrames along rows?  
a) merge() b) concat() c) join() d) append\_rows()
7. Which parameter of read\_csv() is used to specify a column as the index of the DataFrame?  
a) index b) index\_col c) set\_index d) col\_index
8. Which of the following functions displays a Matplotlib chart on screen?  
a) plt.view() b) plt.show() c) plt.display() d) plt.render()
9. Which Matplotlib function is used to add a title to the X-axis?  
a) plt.title() b) plt.xlabel() c) plt.xtitle() d) plt.label()
10. Which SQL command is used to remove all rows from a table but retain its structure?  
a) DELETE b) DROP c) TRUNCATE d) REMOVE
11. Which of the following is a DDL command?  
a) SELECT b) UPDATE c) ALTER d) DELETE
12. Which constraint ensures that a column's value must satisfy a specific condition?  
a) UNIQUE b) CHECK c) DEFAULT d) NOT NULL
13. Which clause is used to remove duplicate rows from query results?

a) UNIQUE b) DISTINCT c) REMOVE DUP d) FILTER

14. Which of the following is NOT an aggregate function in SQL?

a) SUM() b) COUNT() c) ROUND() d) AVG()

15. Which key uniquely identifies each row in a table and cannot contain NULL?

a) Candidate Key b) Primary Key c) Foreign Key d) Alternate Key

16. Which SQL clause is used to filter groups after a GROUP BY operation?

a) WHERE b) HAVING c) FILTER d) ORDER BY

17. Which of the following data types is most suitable for storing a student's percentage in SQL?

a) INT b) DECIMAL c) CHAR d) DATE

18. What is the degree of a table having 5 columns and 20 rows?

a) 20 b) 5 c) 100 d) 25

19. Assertion (A): A Primary Key can consist of more than one column.

Reason (R): A Primary Key made up of two or more columns is called a Composite Key.

a) Both A and R are true and R is the correct explanation of A.

b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false.

d) A is false but R is true.

20. Assertion (A): In Pandas, a Series can hold data of multiple different types simultaneously in an object dtype.

Reason (R): The dtype of a Series is always determined by the first value inserted into it.

a) Both A and R are true and R is the correct explanation of A.

b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false.

d) A is false but R is true.

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## SECTION – 2 MARK QUESTIONS (20 x 2 = 40 Marks)

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21. Write the output:

```
import pandas as pd
S = pd.Series([4, 9, 16, 25], index=['w','x','y','z'])
print(S ** 0.5)
```

22. Differentiate between loc[] and iloc[] indexers of a DataFrame, with an example of each.

23. Write a statement to create a DataFrame 'Fruits' from the dictionary:

```
{ 'Item': ['Apple','Mango','Banana'], 'Price': [120, 80, 40] }
```

Also write the statement to rename column 'Price' to 'Rate'.

24. What is the use of the subplot() function in Matplotlib? Write the statement to create a figure with 1 row and 2 columns of plots.

25. Differentiate between a Primary Key and a Unique Key with respect to NULL values.

26. Write SQL commands for table ITEM(ItemNo, ItemName, Price, Qty):

a) Rename the table ITEM to PRODUCT.

b) Delete the column Qty from the table.



27. Consider table ORDERS(OrderID, CustName, Amount). Write a query to display the number of orders placed by each distinct customer.
28. Differentiate between WHERE and HAVING clauses, with an example where HAVING must be used.
29. Table SALES(Product, Region, Units) has 8 rows, with 2 NULL values in Units. What is the output of:  
SELECT COUNT(\*), COUNT(Units) FROM SALES;
30. What is Referential Integrity? Name the key used to enforce it.
31. What is the output?  
import pandas as pd  
S = pd.Series([10,20,30], index=['a','b','c'])  
print(S.drop('b'))
32. What is the difference between the DataFrame methods drop() and dropna()?
33. Write Pandas statements to: a) create a DataFrame with 3 columns and no data (empty), b) check whether the DataFrame is empty using an appropriate attribute.
34. Write the Python code to plot a bar chart for the following, with bar color 'orange':  
subjects = ['Maths','Science','English']  
marks = [88, 76, 92]
35. What are ticks in Matplotlib? Write a statement to set custom X-axis tick labels for a plot.
36. Differentiate between DELETE and TRUNCATE commands in SQL, with respect to rollback capability.
37. Write SQL commands for table STUDENT(RollNo, Name, Marks):  
a) Add a CHECK constraint ensuring Marks is between 0 and 100.  
b) Modify column Name to have a NOT NULL constraint.
38. Table EMP(EID, Ename, Salary) has values (101,'A',30000), (102,'B',NULL), (103,'C',45000). What is the output of:  
SELECT AVG(Salary) FROM EMP;
39. Write a query on table PRODUCT(PID, PName, Category, Price) to display the number of distinct Categories available.
40. What is a View in SQL (if covered)? OR: What is meant by Data Integrity in a database? Explain briefly.

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### SECTION – 3 MARK QUESTIONS (20 x 3 = 60 Marks)

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41. Consider the DataFrame df:
- |   | Name  | Dept  | Salary |
|---|-------|-------|--------|
| 0 | Aman  | Sales | 32000  |
| 1 | Riya  | IT    | 45000  |
| 2 | Kabir | Sales | 28000  |
| 3 | Tina  | IT    | 51000  |
- a) Display only Name and Salary columns.  
b) Display rows where Salary > 40000.  
c) Display the average Salary.

42. Write the output:

```
import pandas as pd
s1 = pd.Series([1,2,3])
s2 = pd.Series([10,20,30])
print(s1 + s2)
print(s1.append(s2, ignore_index=True))
```

43. Write Python code to plot two lines (Rainfall & Temperature over 5 months) on the same chart with a legend, given:

```
months = ['Jan','Feb','Mar','Apr','May']
rainfall = [20,15,30,45,60]
temperature = [15,18,22,27,31]
```

44. Explain Degree and Cardinality of a table, with reference to STUDENT having 6 rows and 4 columns.

45. Table EMPLOYEE(EID, Ename, Dept, DOJ, Salary). Write SQL queries for:

- a) Display employee names with years of service (assume current year 2026, use YEAR(DOJ)).
- b) Display employees who joined in 2020.
- c) Display the highest salary in each department.

46. Consider Series 'temp' (default index) with values Delhi, Mumbai, Chennai, Kolkata, Pune. Write output for:

- i) `print(temp[temp.str.startswith('M')])`
- ii) `print(temp.iloc[-1])`
- iii) `print(temp[1:4])`

47. Write a program to create a DataFrame "Books" from a dictionary with columns Title and Price, and export it to a CSV file "Books.csv" without the index.

48. Write the output:

```
import pandas as pd
df = pd.DataFrame({'A':[1,2,3],'B':[4,5,6]})
df['C'] = df['A'] + df['B']
print(df)
print(df.sum())
```

49. Write Python code to plot a histogram for the marks of 20 students (list given), with 4 bins and facecolor 'blue', along with title and axis labels.

50. What is meant by a Foreign Key violation? Give an example using two tables, STUDENT and COURSE.

51. Table BOOK(BookID, Title, Genre, Price, Stock). Write SQL queries:

- a) Total value of stock (Price\*Stock) per Genre.
- b) Genres where average Price > 300.
- c) Number of books per Genre.

52. Explain any three DDL commands used in SQL with one example of each.

53. Table LIBRARY(BookID, Title, IssuedTo, IssueDate) — write a query to display Titles of books not yet returned (IssuedTo IS NOT NULL), sorted by IssueDate.



54. Differentiate between a Candidate Key and an Alternate Key, with an example of a table having two candidate keys.
55. Write Python code to create a Series from a NumPy array of 5 random integers, and display its mean, median (if applicable) and standard deviation. (OR: mean and sum if statistics functions not covered)
56. Table TRANSACTION(TID, CustID, Amount, TDate). Write a query to display the total Amount transacted per CustID, only for customers with more than 3 transactions.
57. What is the significance of the GROUP BY clause? Explain with an example query on table SALES(Product, Region, Units).
58. Write Python code to plot a line chart showing a company's profit over 6 months, with markers on each data point and a dashed line style.
59. Explain the NOT NULL and DEFAULT constraints in SQL with one example of each, on a table EMPLOYEE(EID, Ename, Dept).
60. Consider table PATIENT(PID, PName, Age, Disease). Write a query to display the youngest patient's name and age for each disease.

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### SECTION – 4 MARK QUESTIONS (10 x 4 = 40 Marks)

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61. Write a program in Pandas to create the DataFrame "Marks":
- |   | Name  | Maths | Science |
|---|-------|-------|---------|
| 0 | Aditi | 45    | 67      |
| 1 | Rohan | 78    | 82      |
| 2 | Meera | 34    | 55      |
| 3 | Sahil | 90    | 88      |
- a) Add a column "Total" = Maths + Science.  
 b) Display students who scored less than 40 in Maths.  
 c) Sort the DataFrame in descending order of Total.
62. Write the output of the following code, considering Series 'temp' as before:
- print(temp[temp.str.startswith('M')])
  - print(temp.iloc[-1])
  - print(temp[1:4])
- (OR use a fresh dataset — see notes below for a non-repeating variant)  
 NOTE: Use this variant instead — Series 'city' = ['Agra','Pune','Patna','Kanpur','Jaipur']:
- print(city[city.str.startswith('P')])
  - print(city[::-1])
  - print(city.str.upper())
63. Aakash wants a pie chart of market share of 4 companies, with % labels and one slice ("Company D") exploded. Write the code, given:
- ```
companies = ['A','B','C','D']
share = [35,25,20,20]
```
64. What is a Foreign Key? Explain with an example involving STUDENT and COURSE tables.
65. Table BOOK(BookID, Title, Genre, Price, Stock). Write SQL queries:
- Total value of stock per Genre.
  - Genres with average Price more than 300.

66. Write a program to create a DataFrame "Attendance" with columns RollNo and DaysPresent for 5 students, and:

- a) Add a new column "Percentage" = (DaysPresent/90)\*100.
- b) Display records where Percentage < 75.
- c) Display the RollNo with the highest Percentage.

67. Write the output:

```
import pandas as pd
df = pd.DataFrame({'X':[10,20,30,40],'Y':[1,2,3,4]})
print(df[df['X'] > 15])
print(df['X'].cumsum())
```

68. Riya wants a figure with 2 subplots (1 row, 2 columns) — a bar chart of sales and a line chart of profit — for 4 quarters. Write the Matplotlib code to achieve this.

69. Explain the following SQL constraints with one example each on a table ORDERS(OrderID, CustID, Amount, OrderDate):

- a) PRIMARY KEY   b) FOREIGN KEY   c) CHECK   d) DEFAULT

70. Table HOSPITAL(PatientID, PName, Department, Fees). Write SQL queries:

- a) Total Fees department-wise, only where total exceeds 100000.
- b) Number of distinct Departments.

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### SECTION – 5 MARK QUESTIONS (10 x 5 = 50 Marks)

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71. Consider DataFrame 'perf':

|   | EmpID | Name   | Region | Sales |
|---|-------|--------|--------|-------|
| 0 | 101   | Arjun  | North  | 45000 |
| 1 | 102   | Neha   | South  | 62000 |
| 2 | 103   | Vikram | North  | 38000 |
| 3 | 104   | Priya  | East   | 71000 |

- a) Display records from North region.
- b) Increase Sales by 5%.
- c) Display Name & Region of highest Sales.
- d) Add column 'Target' = 50000 for all rows.
- e) Display sorted by Sales ascending.

72. Consider tables TEACHER(TID, TName, Subject, Experience) and ALLOTMENT(TID, ClassAssigned) as before. Write SQL queries:

- a) TName & Subject where Experience > 8.
- b) Average Experience subject-wise.
- c) TName with ClassAssigned for matching TID.
- d) Count of teachers per Subject.
- e) Details of teacher with minimum Experience.

73. Write Pandas code to create DataFrame "Weather":

|   | City    | Temp | Humidity |
|---|---------|------|----------|
| 0 | Delhi   | 38   | 45       |
| 1 | Mumbai  | 32   | 78       |
| 2 | Shimla  | 18   | 60       |
| 3 | Chennai | 35   | 70       |

- a) Create using a dictionary. (2)



- b) Display cities with Temp>30 AND Humidity<70. (2)
- c) Display City with lowest Temp. (1)

74. Meera wants a figure with a bar chart (quarterly expenses) and a line chart (cumulative expenses) as two subplots, one above the other. Write the Matplotlib code, given:

```
quarters = ['Q1','Q2','Q3','Q4']
```

```
expenses = [50000, 62000, 58000, 71000]
```

75. Table HOSPITAL(PatientID, PName, Department, AdmitDate, Fees). Write SQL queries:

- a) Total Fees department-wise, only where total > 100000.
- b) Patients admitted in January (use AdmitDate).
- c) Number of distinct Departments.
- d) PName & Fees sorted descending by Fees (top record).
- e) Average Fees rounded to 2 decimals, department-wise.

76. Write a Python Pandas program to create a DataFrame "Inventory" with columns ItemName, Category, Quantity, UnitPrice for 5 items, and:

- a) Add a column "TotalValue" = Quantity \* UnitPrice. (2)
- b) Display items where Quantity < 10 (low stock). (1)
- c) Display the item with the highest TotalValue. (1)
- d) Display the sum of TotalValue for the entire inventory. (1)

77. Consider tables STUDENT(SID, SName, Class) and MARKS(SID, Subject, Score). Write SQL queries:

- a) Display SName and Class of students in Class 'XII'.
- b) Display average Score per Subject.
- c) Display SName along with Score for each matching SID.
- d) Display the highest Score obtained in the entire MARKS table.
- e) Display the count of students per Class.

78. Write Python code to create a DataFrame "Sales2026" with columns Month and Revenue for 6 months, and:

- a) Plot a line chart of Revenue vs Month directly from the DataFrame using its plot() method. (2)
- b) Display the month with maximum Revenue using idxmax(). (2)
- c) Display total Revenue for the first half of the year. (1)

79. Explain the concept of a Composite Key and a Foreign Key with a suitable example involving two related tables, ORDER and CUSTOMER, each having at least 3 columns.

80. Table COMPANY(CompID, CName, Sector, Turnover). Write SQL queries:

- a) Total Turnover sector-wise, only where total exceeds 500000.
- b) Companies in the 'IT' sector with Turnover > 100000.
- c) Number of distinct Sectors.
- d) CName with the highest Turnover.
- e) Average Turnover, sector-wise, rounded to 2 decimals.