Total No. of Printed Pages—11

HS/XII/A.Sc.Com/IP/22

2022

INFORMATICS PRACTICES

(Theory)

Full Marks : 70

Time : 3 hours

The figures in the margin indicate full marks for the questions

General Instructions :

(i) Write all the answers in the Answer Script.

(ii) Attempt multiple choice questions and very short answer-type questions serially.

(iii) Attempt all parts of a question together at one place.

1. Choose the correct option for the following : 1×6=6

(a) To get the number of elements in a dataframe, _____ attribute may be used.

(i) size

(ii) shape

(iii) value

(iv) ndim

(b) To display the third element of a series object S, you will write

(i) S[:3]

(ii) S[2]

(iii) S[3]

(iv) S[:2]

(c) The technique that divides total distribution of data into a given number of equal proportions is called a

(i) quartile

(ii) tercile

(iii) median

(iv) quantile

(d) Select * from pet;

The above statement allows to

(i) retrieve everything from the table pet

(ii) retrieve everything from the column pet from the table

(iii) Both *(i)* and *(ii)*

(iv) Neither *(i)* nor *(ii)*

(e) Which SQL function is used to count the number of rows in an SQL query?

(i) COUNT()

(ii) NUMBER()

(iii) SUM()

(iv) COUNT(*)

(f) When someone steals someone else's personal information to commit theft or fraud, it's called

(i) identity theft

(ii) hacking

(iii) computer piracy

(iv) infringement

2. Answer the following questions in brief : 1×6=6

(a) Name the two basic data structures of Python Pandas.

(b) What is data pivoting?

(c) What is data visualization?

(d) What is the purpose of ORDER BY Clause?

(e) What are head() and tail()?

(f) What is foreign key?

3. Answer the following questions (select any *three*) : 2×3=6

(a) Mention any two methods to create a dataframe object with examples.

(b) Which function would change the row index and column index in a dataframe? Mention the attributes for each.

(c) Create a series object using list having NaN value.

(d) Name the functions used for creating bar chart and scatter chart.

(e) What is a quartile? How do we generate the first and second quartiles?

4. Answer the following questions (select any *four*) : 2×4=8

(a) What are aggregate functions? Name any two dataframe aggregate functions.

(b) What are the three categories of MySQL function? Give one example from each category.

(c) What is a join? How many different types of joins can you create in MySQL?

(d) Differentiate between VARCHAR and CHAR data types.

(e) Write the SQL command to display the current time and date.

(f) Write a query to add a column (Marks) in a table STUDENT.

5. Answer the following questions (select any *two*) : 2×2=4

(a) What is a network? Mention two advantages of network.

(b) What is a modem? What are the two types of modem?

(c) Differentiate between a Web page and a Website.

(d) What are the important topologies for computer network?

6. Answer the following questions (select any *two*) : 2×2=4

(a) Why is plagiarism a punishable offence?

(b) How can computer virus affect the computer system?

(c) Differentiate between free software and open-source software.

(d) List any health hazards related to excessive use of technology.

7. Answer the following questions (select any *three*) : 3×3=9

(a) Given a dataframe 'SaleDF' as shown below :

	Target	*Sales*
Zone A	56000	58000
Zone B	70000	68000
Zone C	75000	78000
Zone D	60000	61000

Write the statements for the following operations :

(i) To display the sales column

(ii) To change the column index of 'Target' as 'Targeted' and 'Sales' as 'Achieved'

(iii) Display the 2nd and 3rd rows of dataframe 'SalesDF'

(b) Write a program to create the following dataframe. Display the dataframe and delete the first two rows from the dataframe :

Dataframe : DataDF

	Color	*Count*	*Price*
Apple	Red	3	120
Apple	Green	9	110
Pear	Red	25	125
Pear	Green	26	150
Lime	Green	96	70

(c) What advantage does dataframe offer over series data structure? If you have multiple series and a single dataframe, which one would you prefer?

(d) Write a Python program to create a line graph :

Time vs. Distance using appropriate list.

(e) Write a Python program to create two series TEST1 and TEST2 having data as marks of 3 students. Index of both the series is [10, 11, 12]. Add both the series store in third series (RESULT). Display RESULT series.

8. Answer the following questions (select any *three*) : 3×3=9

(a) What is the significance of GROUP BY Clause in an SQL query? Write a query to display the sum of stipends of each class of the student table.

(b) Explain the following functions with example :

(i) ROUND()

(ii) TRUNCATE()

(iii) POW()

(c) Explain WHERE Clause and HAVING Clause of SQL SELECT Statement with examples.

(d) Explain DATE(), MONTH() and DATE() functions with examples.

(e) Write the statements for the following operations in a table STUDENT having Columns—Rollno, Name, Sex :

(i) To add a record having values : [1, 'AJAY', 'MALE']

(ii) To change the name of the student 'John' to 'Rakesh'

(iii) To delete the record of a student having Rollno 20.

9. Explain the following network topologies : 3

(a) Star

(b) Bus

(c) Tree

Or

What is VoIP? Write any two advantages and disadvantages of VoIP.

10. What are intellectual property rights? Why should intellectual property rights be protected? 3

Or

Define the following terms :

(a) Phishing

(b) Eavesdropping

(c) Digital footprint

11. Answer the following questions : 4×2=8

(a) Explain what the following statements are doing. df is the name of dataframe :

(i) df.iloc[:5,]

(ii) df.iloc[2:7, 1:3]

(iii) df.at[:, 'schols'] = [400, 500, 100, 200]

(iv) df.iat[3, 2]

Or

What is missing data? What are the functions required to handle missing data? What are the functions we can use for filling missing data?

(b) Given the following series S1 and S2 :

S1		S2	
A	10	A	80
B	40	B	20
C	34	C	74
D	60	D	90

(i) Write the command to find the sum of series S1 and S2.

(ii) Write the command to find the difference of series S1–S2.

(iii) Write the command to find the product of series S1 * S2.

(iv) Write the command to find S1/S2.

Or

Write a Python program to create a bar graph—CITY vs. POPULATION using the following data :

CITY = ['Delhi', 'Mumbai', 'Shillong', 'Guwahati']

POPULATION = [2436121, 3416912, 341121, 1234729]

Use appropriate label, colour for each bar and title for the chart/graph.

12. Answer the following question : 4

(a) Given the following table :

Table : SOFTDRINK

Dcode	*Dname*	*Price*	*Calories*
101	Lime and Lemon	20·00	120
102	Apple Drink	18·00	120
103	Green Mango	15·00	140
104	Nature Nectar	18·00	115
105	Aam Panna	20·00	135
106	Mango Juice	12·00	150

Write the SQL commands for the following :

(i) To display names and drink codes of those drinks that have more than 120 calories

(ii) To display drink codes, names and calories of all drinks in descending order of calories

(iii) To display names and price of drinks that have price in the range of 12 to 18 (both 12 and 18 are included)

(iv) To increase the price of all drinks in the given table by 10%

Or

(b) Given the following table :

Table : GAMES

GCode	*GName*	*Type*	*No.*	*PMoney*	*SDate*
101	Carom Board	Indoor	2	5000	2004-01-23
102	Badminton	Outdoor	2	12000	2003-12-12
103	Table Tennis	Indoor	4	8000	2004-02-14
105	Chess	Indoor	2	9000	2004-01-01
108	Lawn Tennis	Outdoor	4	25000	2004-03-19

Write the SQL commands for the following :

(i) To display the name of all GAMES with their GCode

(ii) To display the details of those GAMES which are having PMoney more than 7000

(iii) To display the content of the GAMES table in ascending order of SDate

(iv) To display the sum of PMoney for each type of GAMES

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