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HS/XII/A.Sc.Com/IP/23

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INFORMATICS PRACTICES

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 questions :

1×6=6

(a) To create an empty Series object, we can use

- (i) pd. Series (empty)
- (ii) pd. Series (np. NaN)
- (iii) pd. Series()
- (iv) All of the above

(2)

(b) Network device that regenerates and retransmits the whole signal is

(i) modem

(ii) hub

(iii) repeater

(iv) bridge

(c) In MySQL, primary key is

(i) table level constraint

(ii) column level constraint

(iii) row level constraint

(iv) value constraint

(d) Select correct SQL statement to increase price of books by 10% in 'BOOK' table.

(i) UPDATE BOOK SET price = price * 0.1;

(ii) UPDATE BOOK SET price = price + price * 0.1;

(iii) UPDATE BOOK WHERE price = price * 0.1;

(iv) UPDATE BOOK WHERE price =
price + price * 0.1;

(e) A website is a collection of

(i) HTML documents

(ii) graphic files

(iii) audio and video files

(iv) All of the above

(3)

- (f) Digital footprints are stored in
- (i) web browser
 - (ii) web server
 - (iii) both web browser and web server
 - (iv) None of the above

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

- (a) What are intellectual property rights?
- (b) What is the significance of data visualization?
- (c) Mention one advantage and one disadvantage of star topology.
- (d) How does a DBMS (Database Management System) overcome the problem of data redundancy?
- (e) What is plagiarism?
- (f) What is the role of default constraint in MySQL?

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

- (a) Consider the following Series 'S1' :

A	100
B	200
C	300
D	400
E	500

Write a Python code to create the above Series and then double the value in Series and store in another Series named Series 'S2'.

(4)

(b) What will be the output of the following code?

```
School = {'Class1' : {'Roll_No' : 1, 'NAME' :  
                    'Amar'}, 'Class2' : {'Roll_No' : 2,  
                    'NAME' : 'Sultan'}}  
DF = pd. DataFrame (School)  
print (DF)
```

(c) How is a Series data structure different from a dataframe data structure?

(d) What is the significance of 'marker' and 'markersize' parameters in a plot()?

(e) Given are two objects, a list object namely List1 and a Series object namely Series1, both are having similar values, i.e., 2, 4, 6, 8. Find out the output produced by following two statements :

(i) print (List1 * 2)

(ii) print (Series1 * 2)

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

(a) Write the SQL commands to do the following :

(i) To view the structure of 'student' table

(ii) To delete the 'student' table

(b) Give the output for the following statements :

(i) SELECT MOD (14*9, 90/9);

(ii) SELECT ROUND (-3245.78, 1);

(c) What is the use of Group by clause in MySQL?

(5)

(d) Predict the output of the following :

(i) SELECT INSTR ('CODE UNICODE', 'CO');

(ii) SELECT RIGHT (CONCAT ('PYTHON',
'PRACTICES', 'INFORMATICS'), 9);

(e) What is the use of ALTER command in SQL? Give one example.

(f) From a table 'EMP' having two columns Name and Job, write a query to display the number of employees with same job.

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

(a) What is Internet? How is WWW different from Internet?

(b) Differentiate between a web browser and a web server.

(c) What are cookies? What is their utility?

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

(a) How does Internet addiction affect mental health? How to overcome Internet addiction?

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

(c) Differentiate between phishing and pharming.

(6)

7. Answer the following questions :

3×3=9

(a) Consider the following dataframe, 'DF' and answer the questions given below :

<i>City</i>	<i>MaxTemp</i>	<i>MinTemp</i>	<i>Rainfall</i>
Delhi	40	32	24.1
Bengaluru	31	25	36.2
Chennai	35	27	40.8
Mumbai	29	21	35.2
Kolkata	39	23	41.8

- (i) Write a Python statement to add a new column 'Average' with values [36, 28, 31, 25, 31].
- (ii) Write a Python statement to delete fourth row.
- (iii) Write a Python statement to modify 'MinTemp' of Chennai to 32 °C.

Or

Given is a DataFrame 'df' :

	<i>Name</i>	<i>Sex</i>	<i>Position</i>	<i>City</i>	<i>Age</i>	<i>Project</i>	<i>Budget</i>
0	Rabia	F	Manager	Bangalore	30	13	48
1	Evan	M	Programmer	Delhi	27	17	13
2	Jia	F	Manager	Chennai	32	16	32
3	Lalit	M	Manager	Mumbai	40	20	21
4	Jas	M	Programmer	Chennai	28	21	17
5	Suji	F	Programmer	Bangalore	32	14	10

Write the statements for the following operations :

- (i) Create the above DataFrame, 'df'.
- (ii) Display only the Name, Age and position for all rows.
- (iii) Display the budget allocated to different positions, for each city.

(7)

- (b) Write a program to read data from a CSV file Employee.CSV and create a dataframe from it but dataframe should not use file's column header rather should use own column headings as EmpID, EmpName, Designation and Salary. Also display the dataframe.
- (c) What will be the output produced by the following code?

```
Stationery = ['A', 'B', 'C', 'D']
S = pd. Series ([20, 33, 52, 10], index = stationery)
S2 = pd. Series ([17, 13, 31, 32], index = stationery)
print (S+S2)
S=S+S2
print (S+S2)
print (S[0 : 2])
```

Or

Write a Python program to draw two line graphs, City *vs* Avg_Income and City *vs* Population using following data :

```
City = [Mumbai, Shillong, Delhi, Kolkata]
Avg_Income = [500, 100, 350, 300]
Population = [93, 4, 300, 100]
```

8. Answer the following questions : 3×3=9

- (a) Explain order by and group by clauses with example.
- (b) Write the SQL functions which will perform the following operations :
- (i) To display the name of the month of the current date.
 - (ii) To remove spaces from the beginning and end of a string, 'Panorama'.

(8)

(iii) To display the first three characters of your first name (fname).

Or

What are the purposes of the following clauses?

(i) WHERE clause

(ii) HAVING clause

(iii) DISTINCT clause

(c) Explain the following aggregate functions :

MAX(), AVG() and COUNT(*)

9. Differentiate between tree topology and mesh topology of networks. 3

Or

Define the following terms :

(a) URL

(b) Hyperlink

(c) Plugin

10. Write a note on the Indian IT Act. 3

Or

What are the benefits of E-Waste recycling?

11. Answer the following questions :

4×2=8

(a) Consider the following DataFrame 'df' :

	BOOK_ID	BOOK_NAME	AUTHOR_NAME	PRICE
0	C001	<i>Fast Cook</i>	Lata Kapoor	540
1	F001	<i>The Tears</i>	William Hopkins	450
2	T001	<i>My First C++</i>	Brain & Brooke	670
3	T002	<i>C++ Brain</i>	A. W. Rossaine	548
4	F002	<i>Thunderbolts</i>	Anna Roberts	750

Give the output as per the following statements :

- (i) `print (df.loc[:, 'BOOK_NAME'])`
- (ii) `print (df[['BOOK_NAME', 'PRICE']])`
- (iii) `print (df[2:4])`
- (iv) `print (df.iloc[2])`

Or

Write a Python program to create a bar graph to compare the performance of two unit tests for five students. Write proper Xlabel, Ylabel, colour and title.

(b) Consider the following DataFrame 'Sales' containing yearwise sales figures for four salespersons :

	2018	2019	2020	2021
Kapil	110	205	177	189
Kamini	130	165	175	190
Shikhar	115	206	157	179
Mohini	118	198	183	169

- (i) Create the above DataFrame.
- (ii) Display the row labels of sales.

(10)

(iii) Display the dimensions, shape, size and value of sales.

(iv) Display the first two columns of sales.

Or

Given the following series object :

	Marks
Ashish	35
Samit	43
Sam	36
Joe	40
Deepa	65

(i) Display the student's name whose mark > 40.

(ii) Display first three and last three records.

(iii) Increase the mark by 5% whose mark < 40.

(iv) Rename the index with Stu1, Stu2, Stu3, Stu4, Stu5.

12. Answer the following questions :

4

Consider the following table 'STUDENT' :

ST_NO	CLASS	NAME	GAME	G_GRADE	SUPW	S_GRADE
10	7	Karan	Cricket	B	Photography	A
11	8	Arun	Tennis	A	Gardening	C
12	7	Divya	Swimming	B	Photography	B
13	7	Sabina	Tennis	C	Cooking	A
14	9	Veena	Basketball	A	Literature	A
15	10	John	Cricket	A	Gardening	C

(11)

Write the SQL commands for the following :

- (a) Display the number of students getting grade 'A' in cricket.
- (b) Display the names of the students who are getting grade 'C' in either GAME or SUPW.
- (c) Display the SUPW taken up by the students, whose name starts with 'A'.
- (d) Insert a new record into the table 'STUDENT' with random values.

Or

Consider the following table 'EMPLOYEE' :

ECODE	NAME	DESIGNATION	SGRADE	DOJ	DOB
101	William	Executive	S03	23-Mar-2003	13-Jan-1980
102	Adam	Head-IT	S02	12-Feb-2010	22-Jul-1987
103	Sanya	Receptionist	S03	24-Jun-2009	24-Feb-1983
105	John	GM	S02	11-Aug-2006	03-Mar-1984
108	Zen	CEO	S01	29-Dec-2004	19-Jan-1982

Write the SQL commands for the following :

- (a) To display the details of all employees in descending order of DOJ.
- (b) To display NAME and DESIGNATION of those employees whose SGRADE is either S02 or S03.

(12)

(c) To display the content of all the employees whose DOJ is in between '09-Feb-2006' and '08-Aug-2009'.

(d) To add a new row with the following :

19, 'Mark', Head IT, S02, 09-Sep-2007,
21-Apr-1983.
