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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 :

1×6=6

(a) To display the 2nd, 3rd and 4th column from the 5th to 8th rows of a dataframe DF, the correct statement is

 (i) DF.loc [5 : 9, 2 : 5]

 (ii) DF.iloc [5 : 9, 2 : 5]

 (iii) DF.iloc [5 : 8, 2 : 4]

 (iv) DF.loc [5 : 8, 2 : 4]

[P.T.O.

(b) Aggregate functions are also known as

    (i) scalar functions

    (ii) single-row functions

    (iii) multiple-row functions

    (iv) hybrid functions

(c) What command will one use from the following to change the working database?

    (i) Change

    (ii) Select

    (iii) Use

    (iv) Open

(d) Which of the following is not a text function?

    (i) TRIM()

    (ii) TRUNCATE()

    (iii) LEFT()

    (iv) MID()

(e) Switch is a _____ device.

    (i) broadcast

    (ii) unicast

    (iii) multicast

    (iv) None of the above

(f) Out of the following, which crime(s) will come under cyber crime category?

  (i) Identity theft

  (ii) Invasion of privacy

  (iii) Online harassment

  (iv) All of the above

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

(a) Write a statement to display the number of dimensions of the underlying data in a series object.

(b) Define an equi-join.

(c) What is a gateway?

(d) What is the purpose of ALTER command in SQL?

(e) What is cyber bullying?

(f) What is copyright infringement?

(4)

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

   (a) What is the difference between <DF>.iterrows() and <DF>.iteritems() method?

   (b) What is histogram? How do you create histograms in Python?

   (c) Given a dataframe namely edf. Write a statement to transpose the dataframe.

   (d) Write any two advantages of storing data in CSV format.

   (e) Given a dataframe df as shown below :

	A	B	D
0	15	17	19
1	16	18	20
2	21	22	23

   What will be the results of the following code statements?

    (i) df.A[1]=np.NaN

   (ii) df ['C']=[12, 15, 27]

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

   (a) What is the significance of Group By Clause? Write an SQL query using Group By Clause.

   (b) Write the SQL query for the following :

    (i) To display the structure of the table Student.

    (ii) To view all tables in a database.

(c) Given a table Student as under :

Roll_no	SNames
19	Donny
43	Jack
55	Kevi

What are cardinality and degree of the table Student?

(d) Differentiate between Where Clause and Having Clause.

(e) Write short notes on Candidate key and Alternate key.

(f) Give the outputs for the following statements :

   (i) SELECT SUBSTR ('PINEAPPLE', 5, 5)

   (ii) SELECT MOD(26, 7)

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

(a) Differentiate between static and dynamic web pages.

(b) What are repeater and router?

(c) State one advantage and one disadvantage of Star topology.

(d) What is URL and what is domain name? Give examples.

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

   (a) What are Phishing and Hacking?

   (b) Mention two measures to keep your digital footprint clean.

   (c) Why is it important to protect intellectual property rights?

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

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

   (a) Write a program to create a series object with six random integers and having indexes as ['g', 'h', 'i', 'j', 'k', 'l'].

   (b) Write a program that reads from a CSV file where the separator character is '$'. Read only first five rows in your dataframe.

      • Give column heading as ItemName, Quantity, Price.

      • Make sure to read first row as data and not as column headers.

   (c) Write a Python program to create a horizontal bar graph to show the performance of unit test for five students. Write proper X label, Y label, Colour and Title.

(d) Given are two objects, a series object namely srl1 and a list object namely lst1, srl1 having values as 2, 4, 6 and lst1 having values as 2, 4, 6, 8. Find out the output produced by the following statements :

  (i) print(srl1*2)

  (ii) print(lst1*3)

  (iii) print(srl1.shape)

(e) A list stores three dictionaries such as d1, d2 and d3, each dictionary storing Cost_Price, Selling_Price and Profit. Write a program to create a dataframe from it.

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

(a) What is the significance of using aggregate functions in SQL query? Modify the stream of a student having the roll_number as '003' to 'Science' in 'Student' table.

(b) Explain the following SQL functions with examples :

  (i) INSTR()

  (ii) MONTHNAME()

  (iii) ROUND()

(c) Consider a table name 'VEHICLES'. Write SQL commands to

  (i) display the average 'price' of each 'type' of vehicle having 'quantity' more than 20;

  (ii) count the 'type' of vehicles;

  (iii) display the total 'price' of all 'types' of vehicles.

(d) What is a foreign key? How is it different from a primary key? How do you define a foreign key in a table?

(e) Write the queries 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. Answer any *one* question from the following :　　　3

(a) Briefly explain the basic concepts of Web Page, Web Server and Web Hosting.

(b) What is the structure of an email message? Explain in brief.

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

10. Answer any *one* question from the following :　　　3

(a) What are the first three operations involved during proper recycling process of e-waste management?

(b) Mention at least three net etiquettes.

(c) Richa recently started using her social media account. Within a few days, she befriends many people she knows and some that she does not know. After some time, she started getting negative comments on her posts. She also finds that her pictures are being shared online without her permission. Based on the given information, answer the questions given below :

   (i) Identify the type of cyber crime she is a victim of.

 (ii) Under which act, she can lodge a complaint to the relevant authorities?

(iii) Suggest her any two precautionary measures which she should take in future while being online to avoid any such situations.

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

(a) Consider the following dataframe 'Agriculture' containing the different names of agriculture in different regions of the world :

	Region	Names
A	Vietnam	Ray
B	Philippines	Chengin
C	Brazil	Roka
D	Venezuela	Konuko
E	Congo Masole	Masole

Write the statements for the following :

 (i) Display the last three rows from the above dataframe.

(ii) Add a new row having data as region name 'Malaysia' and its agriculture name as 'Ladang'.

(iii) Change the heading from 'Region' to 'Area' and from 'Names' to 'Agriname'.

(iv) Delete the data of index labelled as 'D' from the dataframe 'Agriculture'.

Or

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]

(b) Plot the following data using a line plot :

Day	1	2	3	4	5	6	7
Tickets sold	2000	2800	3000	2500	2300	2500	1000

- Before displaying the plot display "Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday" in place of Day, 1, 2, 3, 4, 5, 6, 7.

- Change the colour of the line to 'Magenta'.

(**11**)

Or

Consider the table below :

	2022–23	2023–24
Economics	20	18
Computer–Sc	15	26
History	11	12
Physics	25	14
Business	21	17
Statistics	20	11

Write a program in Python to create a dataframe 'strength', which shows number of students in each subject as per the given academic session using dictionary. Export the contents of dataframe to subject.CSV file in C: drive.

12. *(a)* Consider the following table 'STOCK' :

Table : STOCK

ITEM_No	ITEMNAME	QUANTITY	UNIT_PRICE
4001	Eraser	210	14
4006	Pen Premium	125	5
4002	Pen Classic	200	20
4005	Ball Pen 0·5	150	16
4003	Ball Pen 0·25	100	22

Write the SQL commands for the following :

(i) Display ITEMNAME and total 'Payable Price' as per the 'UNIT_PRICE' and 'QUANTITY' from 'STOCK' table.

(ii) Display ITEM_NO, ITEMNAME and UNIT_PRICE in decending order of UNIT_PRICE.

    (iii) Display details of those items whose ITEM_NO is 4002 and 4005.

    (iv) Display all items that start with a letter 'P'.   4

<div align="center">Or</div>

  (b) Consider the following table PATIENT :

<div align="center">Table : PATIENT</div>

P_NO	PNAME	DEPARTMENT	Charges	Gender
P001	Karina	ENT	350	F
P002	Sushma	Cardiology	800	F
P003	Zareen	Surgery	300	F
P004	Arup	Cardiology	800	M
P005	Jack	Cardiology	800	M
P006	Sam	ENT	350	M
P007	Zeena	Surgery	300	F

Write the SQL commands for the following :

  (i) Display the total charges of the ENT department from the table PATIENT.

 (ii) Display the patient's names, departments and charges of all female patients.

(iii) Display the total number of departments from the table PATIENT.

(iv) Increase the charges of Surgery department by ₹ 150 permanently in the database table (PATIENT).

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