

Total No. of Printed Pages—15

HS-XII-A-Sc-Com-IP-26

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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) This question paper contains 37 questions.
- (ii) All questions are compulsory. However, internal choices have been provided in some questions. Attempt only one of the choices in such questions.
- (iii) The paper is divided into 5 sections— A, B, C, D and E.
- (iv) Section—A consists of 21 questions (**1** to **21**). Each question carries 1 mark.
- (v) Section—B consists of 7 questions (**22** to **28**). Each question carries 2 marks.
- (vi) Section—C consists of 4 questions (**29** to **32**). Each question carries 3 marks.
- (vii) Section—D consists of 2 questions (**33** and **34**). Each question carries 4 marks.
- (viii) Section—E consists of 3 questions (**35** to **37**). Each question carries 5 marks.
- (ix) All programming questions are to be answered using Python language only.
- (x) In case of MCQ, text of the correct answer should also be written.

(2)

SECTION—A

Answer the following as directed :

1×21=21

1. A DataFrame can be thought of as a group of multiple series objects.

(State True or False)

2. To get the transpose of a DataFrame DF1, you can write

- (a) DF1.T
- (b) DF1.Transpose
- (c) DF1.Swap
- (d) DF1.TRANS

(Choose the correct option)

3. Which argument of bar() lets you set the thickness of bar?

- (a) thick
- (b) thickness
- (c) width
- (d) bar width

(Choose the correct option)

4. To display the 3rd, 4th and 5th columns from 6th to 9th rows of a DataFrame DF, you can write

- (a) DF.loc [5:9, 2:5]
- (b) DF.loc [2:5, 5:9]
- (c) DF.iloc [5:9, 2:5]
- (d) DF.iloc [2:5, 5:9]

(Choose the correct option)

(3)

5. While reading from a CSV file, to use a column's values as index labels, argument given in read_CSV() is

- (a) index
- (b) index_col
- (c) index_values
- (d) index_label

(Choose the correct option)

6. Name the methods you can use to iterate over DataFrame.

7. The MySQL function that returns the specified number of characters from a particular position of a given string is

- (a) MID()
- (b) SUBSTRING()
- (c) SUBSTR()
- (d) All of the above

(Choose the correct option)

8. Which of the following types of constraints will prevent the entry of duplicate rows?

- (a) CHECK
- (b) DISTINCT
- (c) Primary Key
- (d) Null

(Choose the correct option)

(4)

9. Which of the following statements will delete all rows in a table namely MyTable without deleting the table structure?

- (a) DELETE FROM MyTable;
- (b) DELETE TABLE MyTable;
- (c) DROP TABLE MyTable;
- (d) DELETE MyTable;

(Choose the correct option)

10. Which of the following SQL statements will give an output as 200.6 after execution?

- (a) SELECT ROUND (200.56, 0);
- (b) SELECT ROUND (200.56, -1);
- (c) SELECT ROUND (200.56, 2);
- (d) SELECT ROUND (200.56, 1);

(Choose the correct option)

11. The ____ function in MySQL joins two or more strings.

(Fill in the blank)

12. What is the role of foreign key?

13. Function count() is a/an _____ function in SQL.

(Fill in the blank)

14. A device that connects two different networks and directs data packets is a

- (a) hub
- (b) switch
- (c) router
- (d) repeater

(Choose the correct option)

(5)

15. Cookies are stored in the web server.

(State True or False)

16. Define webpage.

17. The rights of the owner of information to decide how much information is to be shared/exchanged/distributed, are collectively known as

(a) Intelligent Property Rights

(b) Intellectual Property Rights

(c) Interactive Property Rights

(d) Instance Property Rights

(Choose the correct option)

18. Mention any two health hazards associated with inappropriate and excessive use of gadgets.

19. Define digital footprint.

20. What is URL?

21. What is alternate key?

(6)

SECTION—B

Answer the following questions :

2×7=14

22. List any two differences between series and DataFrame in Pandas.

23. Complete the given Python code to get the required output as : Rajasthan

```
import ____ as pd
di={'Corbett' : 'Uttarakhand', 'Sariska' : 'Rajasthan',
'Kanha' : 'Madhya Pradesh', 'Gir': 'Gujarat'}
NP = _____.Series (_____)
print (NP [_____])
```

24. (a) Given are two objects, a list object namely lst1 and a series object namely ser1, both are having similar values i.e., 2, 4, 6, 8. Find out the output produced by the following statements :

(i) print(lst1*2)

(ii) print(ser1*2)

Or

(b) Write a Python program to plot a line chart based on the given data to depict the changing weekly average temperature in Delhi for four weeks :

```
Week = [1, 2, 3, 4 ]
Avg_week temp = [40, 42, 38, 44]
```

(7)

25. Write down the results returned by the following queries :

(a) `SELECT MOD (11, 4);`

(b) `SELECT SUBSTRING ('Quadratically', 5, 6);`

26. (a) Differentiate between Web browser and Web server.

Or

(b) What is meant by network topology? List any two popular topologies.

27. (a) Mary, a class XI student, has written code for a website but is unsure how to make it available on the Internet. Explain to Mary the role of a web server and web hosting in ensuring availability of her website on the Internet.

Or

(b) Explain the concept of VoIP and mention one benefit of using it.

28. What measures should you take to keep data secure?

(8)

SECTION—C

Answer the following questions :

3×4=12

- 29.** (a) Given a DataFrame namely Data as shown in the figure below :

<i>Fruit</i>	<i>Color</i>	<i>Count</i>	<i>Price</i>
Apple	Red	3	120
Apple	Green	9	110
Pear	Red	25	125
Pear	Green	26	150
Lime	Green	99	70

Write the code statement to—

- (i) find all rows with the label 'Apple' and extract all columns;
- (ii) list the fruits with Count more than 25;
- (iii) list 2nd, 3rd and 4th rows.

Or

- (b) The series object S1 stores the charity contribution made by each section :

A 6700

B 5600

C 5000

D 5200

Write a program to create the series S1 and sort the values of series S1 in descending order of its index and store it into series S3.

30. Consider the table PETDATA with the following data :

Table : PETDATA					
ID	PName	Breed	LifeSpan	Price	Discount
101	Adi	Golden Retriever	15	16000	5
202	Candy	Boxer	11	22000	10
303	Dazzler	Bulldog	10	18000	NULL
404	Akash	Yorkshire Terrier	16	20000	12
505	Akira	Pug	NULL	25000	8

(a) Write SQL queries for the following :

- (i) Display all the pet names in upper case.
- (ii) Display the total price of all the pets.
- (iii) Display the average discount available on all the pets.

Or

(b) Write the output of the following SQL queries :

- (i) SELECT ID, PName FROM PETDATA ORDER BY PName DESC;
- (ii) SELECT FROM PETDATA WHERE PName LIKE "A%";
- (iii) UPDATE PETDATA SET LifeSpan = 17 WHERE PName = "Akash";

(10)

31. Answer the following questions :

- (a) What is Equi Join? 1
- (b) What is the difference between WHERE clause and HAVING clause? 2

32. (a) Why is it important to have a positive digital footprint? Write any three points to support your answer.

Or

- (b) Why should intellectual property rights be protected? Give any three reasons.

SECTION—D

Answer the following questions :

4×2=8

33. (a) Medal tally of the Commonwealth Games, 2018 of India :

Country	Gold	Silver	Bronze	Total
India	26	20	20	66

Write a program to create a horizontal bar chart for India's medal tally for the above table. Write an appropriate chart title and both axis labels. Also give suitable Python statements to store this chart.

Or

- (b) The heights of 10 students of eighth grade are given below :

Height_cms = [145, 141, 142, 142, 143, 144, 141, 140, 143, 144]

Write suitable Python code to generate a histogram based on the given data, along with an appropriate chart title and both axis labels. Also give suitable Python statement to save this chart.

34. (a) Write the output for the following SQL queries :

Table : FASHION

ID	Product	Price	Qty
F01	Kajal	970	10
F02	Foundation	2100	15
F03	Night cream	1700	20
F04	Day cream	1400	10
F05	Shampoo	1200	25
F06	Lipstick	850	32

- (i) SELECT COUNT (Product) FROM FASHION;
- (ii) SELECT SUM (Price Qty) FROM FASHION
WHERE Product = "Night cream";
- (iii) SELECT LEFT (Product, 4) FROM FASHION
WHERE Price > 1500;
- (iv) SELECT MIN (Price) FROM FASHION;

Or

(b) Find the output for the following SQL queries :

- (i) SELECT SUBSTR ("CLIMATE CHANGE", 4, 4);
- (ii) SELECT UCASE (RIGHT ("Pollution", 3));
- (iii) SELECT LENGTH ("HAPPY")+3;
- (iv) SELECT INSTR ("WELCOME WORLD",
"COME") ;

(12)

SECTION—E

Answer the following questions :

5×3=15

35. (a) Consider the DataFrame df shown below :

	<i>Name</i>	<i>Department</i>	<i>Salary</i>
0	Rohan Sharma	IT	75000
1	Meera Kapoor	HR	68000
2	Aarav Singh	Finance	85000
3	Nisha Singh	Marketing	72000
4	Aditya Verma	IT	80000

Write Python statements for the following tasks :

- (i) Print the last three rows of the DataFrame df.
- (ii) Add a new column named “Experience” with values [5, 8, 10, 6, 7].
- (iii) Delete the column “Salary” from the DataFrame.
- (iv) Rename the column “Department” to “Dept”.
- (v) Display only the “Name” and “Salary” columns from the DataFrame.

Or

(b) Consider the following code and figure out what these are trying to do. The Pandas library has been imported as pd.

- (i) `pd.read_csv(“data.csv”, n rows = 20)`
- (ii) `pd.read_csv(“data.csv”, skiprows = [1, 2, 3, 4])`
- (iii) `pd.read_csv(“data.csv”, header = None)`

(iv) `pd.read_csv("data.csv", sep = '@')`

(v) `pd.read_csv("data.csv", index_col = 'Ename')`

36. (a) Write suitable SQL queries for the following :

- (i) Count the characters in the string 'Artificial Intelligence'.
- (ii) Find the position of 'i' in the column named 'Topic' of the Seminars table.
- (iii) Square the Duration column in the Session table.
- (iv) Display the average rating from the Rating column in the Reviews table.
- (v) Display the total rating from the Rating column in the Reviews table.

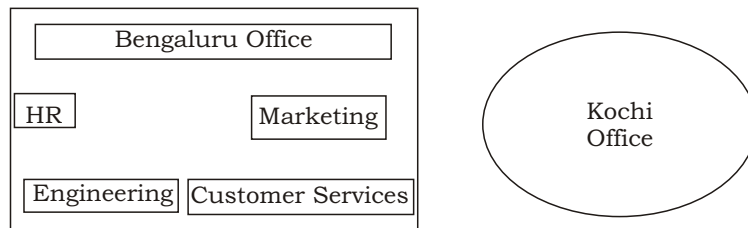
Or

(b) Write the SQL functions which will perform the following operations :

- (i) To display the name of the weekday of your date of birth.
- (ii) To convert e-mail id to lowercase.
- (iii) To count the number of characters in your name.
- (iv) To display the first character of your name.
- (v) To calculate the average marks secured by the class.

37. (a) Read the text carefully and answer the questions :

ABC Solutions Ltd. is a prominent IT services firm with its headquarters in Bengaluru and a regional office in Kochi. The Bengaluru office comprises four departments : HR, Marketing, Engineering and Customer Services.



The distances between these departments, as well as between Bengaluru and Kochi, are as follows :

HR to Marketing : 55 metres

HR to Engineering : 85 metres

HR to Customer Services : 110 metres

Marketing to Engineering : 45 metres

Marketing to Customer Services : 65 metres

Engineering to Customer Services : 40 metres

Bengaluru Office to Kochi Office : 1200 kilometres

The no. of computers in each department/office is as follows :

HR : 100

Marketing : 80

Engineering : 80

Customer Services : 30

Kochi Office : 60

(15)

As a network engineer, you have to propose solutions for various queries listed from (i) to (v).

- (i) Suggest the most suitable department in the Bengaluru Office setup to install the server. Also, give a reason to justify your suggested location.
- (ii) Draw a suitable cable layout of wired network connectivity between the departments in the Bengaluru Office setup.
- (iii) Which hardware device will you suggest to connect all the computers within each department?
- (iv) Suggest the most appropriate type of network (LAN, MAN, WAN) to connect the Bengaluru Head Office and Kochi Regional Office.
- (v) When a signal is transmitted through a wire from HR department to Customer Services department, its strength reduces. Which device would you suggest the company of use to solve the problem?

Or

- (b) Differentiate between BUS topology and STAR topology. Write any three advantages of BUS topology and three disadvantages of STAR topology. 2+3=5

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