



Series **ΣHEFG/C**



Set-4

Q.P. Code **90**

Roll No.

Candidates must write the Q.P. Code on the title page of the answer-book.

INFORMATICS PRACTICES

Time allowed : 3 hours

Maximum Marks : 70

- Please check that this question paper contains **13** printed pages.
- Q.P. Code given on the right hand side of the question paper should be written on the title page of the answer-book by the candidate.
- Please check that this question paper contains **35** questions.
- **Please write down the serial number of the question in the answer-book before attempting it.**
- 15 minute time has been allotted to read this question paper. The question paper will be distributed at 10.15 a.m. From 10.15 a.m. to 10.30 a.m., the students will read the question paper only and will not write any answer on the answer-book during this period.

General Instructions :

- This question paper contains five sections, **Section A to E.***
- All** questions are compulsory.*
- Section A** has **18** questions carrying **1** mark each.*
- Section B** has **7** Very Short Answer type questions carrying **2** marks each.*
- Section C** has **5** Short Answer type questions carrying **3** marks each.*
- Section D** has **3** Long Answer type questions carrying **5** marks each.*
- Section E** has **2** questions carrying **4** marks each. **One** internal choice is given in **Q. 35** against Part **E** only.*
- All** programming question are to be answered using Python language only.*



Section A

1. A _____ is a network device that can receive the data, analyse it and transmit it to other networks. 1
- (a) Modem (b) Switch
(c) Repeater (d) Router
2. We need to exhibit proper manners and etiquettes while being online. Pick up one such net etiquette from the following : 1
- (a) Do not share the expertise
(b) Respect privacy and diversity
(c) Feed the troll
(d) Copyright violation
3. A patent protects an invention for _____ years, after which it can be freely used. 1
- (a) 40 (b) 30
(c) 20 (d) 10
4. Write the output of the following SQL query : 1
- SELECT LCASE(SUBSTR("Project Management",9,6)) ;**
- (a) Manag (b) Manage
(c) MANAGE (d) manage
5. Write the output of the following SQL command : 1
- select pow(2,2*2) ;**
- (a) 16 (b) 2
(c) 4 (d) 8
6. E-waste contains _____ that causes respiratory disorders and brain damage. 1
- (a) Cadmium (b) Beryllium
(c) Lead (d) Mercury



7. In SQL, _____ returns the month name from the specified date. 1
- (a) MONTH()
 - (b) DATE()
 - (c) MONTHNAME()
 - (d) NOW()
8. Which of the following SQL function returns the number of values in the specified column ignoring the NULL values ? 1
- (a) COUNT(*)
 - (b) COUNT(columnname)
 - (c) LENGTH(*)
 - (d) LENGTH(columnname)
9. _____ helps to fetch a group of rows based on common values in a column. 1
- (a) ORDER BY
 - (b) FILTER
 - (c) GROUP BY
 - (d) SELECT BY
10. What will be the output of the Python program mentioned below ? 1
- ```
import pandas as pd
df=pd.DataFrame(['Apple', 'Banana', 'Orange', 'Grapes', 'Guava'])
print(df[2:4:2])
```
- (a) 0  
2 Banana
  - (b) 0  
2 Orange
  - (c) 0  
2 Banana  
4 Grapes
  - (d) Empty DataFrame  
Columns: [0]  
Index: [ ]



11. Which of the following is a one-dimensional array containing a sequence of values in Python ? 1
- (a) Relation (b) DataFrame  
(c) Series (d) Square
12. In Python Pandas, head(n) method returns the first n members of the series. What is the default value of n ? 1
- (a) 2 (b) 3  
(c) 4 (d) 5
13. \_\_\_\_\_ is a service that allows to put a website or a web page on the Internet. 1
- (a) Web Server  
(b) Web Browser  
(c) Web Hosting  
(d) Domain Name System
14. Find the output of the following SQL queries : 1
- Select INSTR("Data Science", "ie");**
- (a) 8 (b) - 5  
(c) True (d) False
15. Rupam created an assistive device for the blind. This device is very helpful for the blind and people with low vision. Now, she wants that no one should copy her innovation. What should she do ? 1
- (a) Get the trademark for her invention  
(b) Get the license for her invention  
(c) Get the patent for her invention  
(d) Get the copyright for her invention
16. Presenting someone else's idea or work as one's own idea or work is called : 1
- (a) Phishing (b) Stacking  
(c) Plagiarism (d) Bullying



**For Questions number 17 and 18, two statements are given — one labelled as Assertion (A) and the other labelled as Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below.**

- (a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).
- (b) Both Assertion (A) and Reason (R) are true, but Reason (R) is **not** the correct explanation of Assertion (A).
- (c) Assertion (A) is true, but Reason (R) is false.
- (d) Assertion (A) is false, but Reason (R) is true.

**17.** *Assertion (A)* : Modem stands for ‘Modulator Demodulator’.

*Reason (R)* : The modem at the sender’s end acts as a demodulator that converts the digital data into analogue signals and at the receiver’s end acts as a modulator that converts analogue signals into digital data. 1

**18.** *Assertion (A)* : In order to be able to use Python’s data visualization library, we need to import the pyplot module from matplotlib library.

*Reason (R)* : The pyplot module houses a variety of functions required to create and customize charts or graphs. 1

### **Section B**

**19.** (a) Write any one main advantage and one main disadvantage of Star Topology. 2

**OR**

(b) With reference to browsing the websites, briefly explain the term cookie. Also mention any two points of significance of it. 2



20. Arpit wants to find the total commission earned by those departments where the number of employees in the department is more than 2 and writes the following query :

```
Select department, count(commission) from TECHNO having count(*)>2 group by department;
```

But he got an error. Identify the error(s) and rewrite the query by underlining the correction(s) done. 2

21. Ananya, a database executive, needs to display a system's current date and time. Suggest to her a suitable SQL function name. Also write the query for the same. 2

22. Shobit needs to create the following two series named 'Eng' and 'Math'. Help him to create a DataFrame 'mydata' from the given series 'Eng' and 'Math'. 2

| Eng    |       | Math   |       |
|--------|-------|--------|-------|
| Aditi  | 25    | Aditi  | 9     |
| bhavuk | 21    | bhavuk | 29    |
| chirag | 23    | chirag | 15    |
| deepak | 24    | deepak | 14    |
| Gaurav | 27    | Gaurav | 20    |
| dtype: | int64 | dtype: | int64 |

23. (a) What do you understand by Copyright Infringement ? What can be done as a user to avoid Copyright Infringement ? 2

**OR**

(b) What is meant by Trademark Infringement ? What action can the owner take against someone who infringes its registered trademark ? 2

24. What will be the output of the following code ? 2

```
import pandas as pd
S1=pd.Series(data=[1,7])
S2=pd.Series(S1+S1)
print(S2)
```



25. Carefully observe the following code : 2

```
import pandas as pd
product={'prodid':pd.Series([1,2,3,4,5]),
 'pname':pd.Series(['pen', 'pencil', 'eraser',
 'color', 'sharpener']),
 'qty':pd.Series([2,10,10,30,10]),
 'price':pd.Series([300,20,50,40,15])}
stock=pd.DataFrame(product)
print(stock)
```

Write Python statements for the following :

- (i) Display the names of products.
- (ii) Rename the column 'price' to 'newprice' in the DataFrame stock.

### Section C

26. Consider the table Customer given below and write SQL commands : 3

**TABLE : Customer**

| CustID | Name     | Country  | Emailid         | Orderdate  |
|--------|----------|----------|-----------------|------------|
| C1001  | Rajat    | India    | rajat@gmail.com | 2022-12-22 |
| C1002  | Michael  | Denmark  | mic@yahoo.com   | 2023-11-15 |
| C1003  | Riyo     | Thailand | Ri@gmail.com    | 2022-05-06 |
| C1004  | Jennifer | S. Korea | Jen@gmail.com   | 2022-08-07 |
| C1005  | Sudha    | India    | Sud@abc.com     | 2023-01-01 |
| C1006  | Vivek    | Nepal    | viv@xyz.com     | 2023-04-14 |

- (i) Display the details of all customers who have placed the order in the year 2023.
- (ii) Count the total number of customers from India.
- (iii) Display the last 9 characters of the email id of all customers of Denmark.

27. Write a program in Python Pandas to create a series "car" from the following Dictionary : 3

```
dic={
 "Model": ["Samurai", "Accord", "CR-V", "Nexon"],
 "Brand": ["Suzuki", "Honda", "Honda", "Tata"],
 "Make": [1993, 1997, 1997, 2021]}
```



28. Consider the given DataFrame 'result' :

|   | Name   | Percentile |
|---|--------|------------|
| 0 | Rohit  | 95         |
| 1 | Mohit  | 76         |
| 2 | Raman  | 98         |
| 3 | Aditya | 47         |

Write the suitable Python statements for the following :

3

- Add a new column 'Grade' to the dataframe having values A, B, A, C.
- Add a new row where Name is 'Arti' with Percentile as 92 and Grade A.
- Display the top 3 rows.

29. (a) Riti received a message that she needs to update the KYC for her Bank Account therefore she should upload her Aadhar Card, Bank Account Number and the OTP on the link given in her message.

Answer the following questions :

3

- Should Riti upload the documents and give the OTP on the link ?
- Should Riti call her bank immediately to recheck the validity of the message received ?
- What is the act mentioned in the message known as ?

**OR**

(b) Briefly explain the term FOSS. Give examples of any 2 Operating Systems that are FOSS.

3

30. (a) Write the output (i-iii) for the following SQL commands :

3

Table : CLUB

| SNo | Activity | Fee   | Days  |
|-----|----------|-------|-------|
| 1   | Swimming | 10000 | M, W  |
| 2   | Singing  | 8000  | Th, S |
| 3   | Dance    | 12000 | M, W  |
| 4   | Drawing  | 7000  | T, Th |
| 5   | Craft    | 8000  | F, S  |
| 6   | Cooking  | 9000  | T, F  |





- (i) `SELECT COUNT(*) FROM CLUB;`
- (ii) `SELECT SUM(Fee) FROM CLUB;`
- (iii) `SELECT LEFT(Activity,2) FROM CLUB WHERE Days='M,W';`

**OR**

- (b) Find the output of the following SQL queries : 3
- (i) `SELECT MID("Exam",1,2);`
  - (ii) `SELECT MONTHNAME("2023-05-30");`
  - (iii) `SELECT MONTH("2023-03-05");`

### Section D

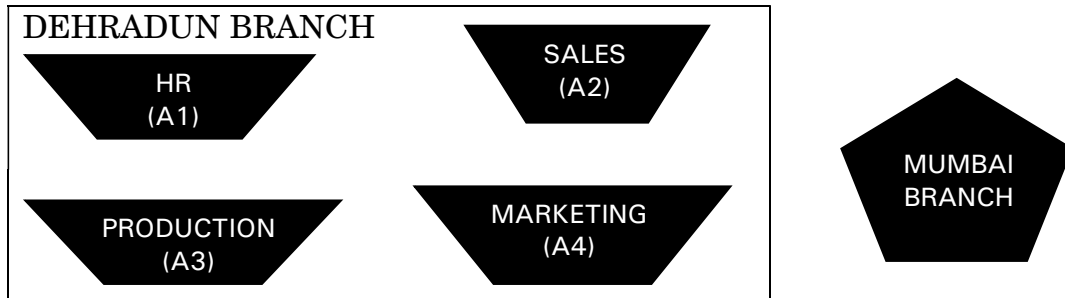
31. (a) Write the SQL queries which will perform the following operations : 5
- (i) To display the day part from your date of admission, which is '2023-12-13'.
  - (ii) To convert your father's email id 'xyz@abc.com' to uppercase.
  - (iii) To count the number of characters in the string 'India'.
  - (iv) To display today's day name i.e., Sunday or Monday ...
  - (v) To display your height 5.41 after rounding off to 1 decimal place.

**OR**

- (b) Explain the following SQL functions using suitable examples : 5
- (i) `LTRIM()`
  - (ii) `RTRIM()`
  - (iii) `INSTR()`
  - (iv) `MOD()`
  - (v) `TRIM()`



32. AWESOME Private Ltd, Dehradun is a company that deals with hardware components. They have different divisions HR (A1), Sales (A2), Production (A3) and Marketing (A4). The layout of the Dehradun branch is :



The company also has a branch in Mumbai. The management wants to connect all the divisions as well as the computers of each division (A1, A2, A3, A4).

Distance between the wings are as follows :

|                                       |         |
|---------------------------------------|---------|
| A3 to A1                              | 32m     |
| A1 to A2                              | 53m     |
| A2 to A4                              | 29m     |
| A4 to A3                              | 110m    |
| A3 to A2                              | 750m    |
| A1 to A4                              | 200m    |
| Dehradun Head Office to Mumbai Office | 1656 KM |

Number of computers in each wing :

|    |     |
|----|-----|
| A1 | 70  |
| A2 | 140 |
| A3 | 55  |
| A4 | 70  |

Based on the above specifications, answer the following questions :

5

- Suggest the topology and draw the most efficient cable layout for connecting all the divisions of the Dehradun branch.
- Suggest the kind of network required (out of LAN, MAN, WAN) for connecting Production (A3) with Sales (A2).

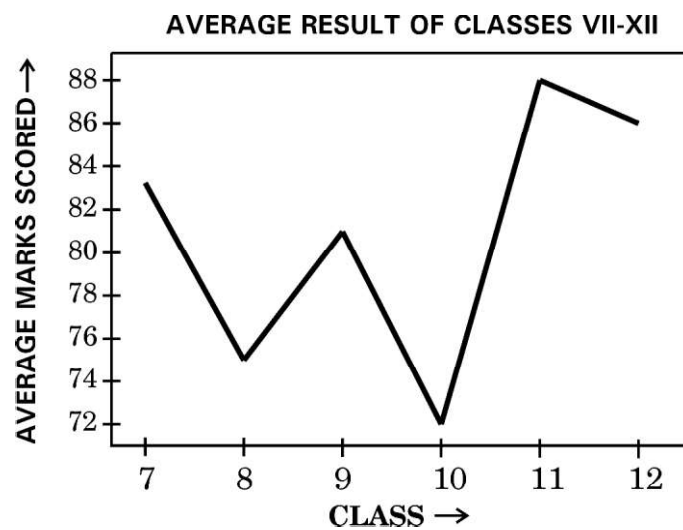


- (c) Suggest the placement of the server. Explain the reasons for your selection.
- (d) Suggest the placement of the Switch/Hub device with justification.
- (e) The company wants to do a collaborative project where the employees of Dehradun and Mumbai would collaborate and do the project. Therefore, the HR planned a series of webinars that employees could attend from their devices being online. Suggest the protocol that helped to send the voice signals over the Internet. Also, give an example of a video conferencing software that helps to connect all the employees.

**33.** (a) Consider the following graph. Write the Python code to plot it. Also add the Title and Label for X and Y axis.  
Use the following data to draw the graph.

5

| Class | Marks |
|-------|-------|
| 7     | 83    |
| 8     | 75    |
| 9     | 81    |
| 10    | 72    |
| 11    | 88    |
| 12    | 86    |



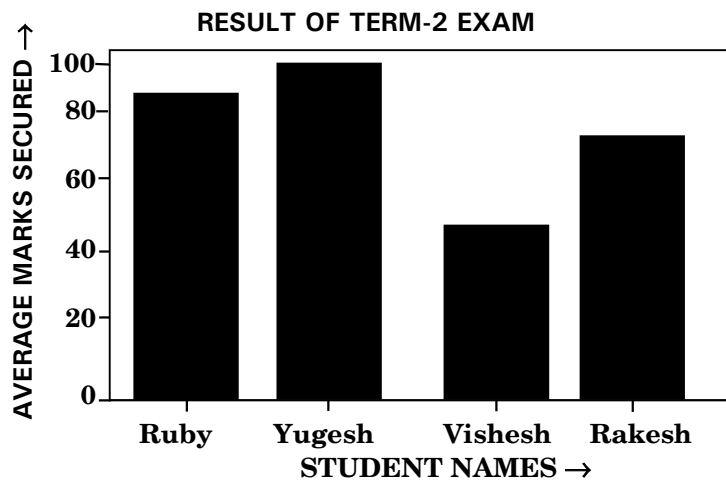
**OR**



- (b) Write a Python code to draw the following bar graph representing the average marks secured by each student in Term-2 Exam. Add the Title and Label for X-axis and Y-axis. Use the following data to draw the graph :

5

| Names   | Average Marks |
|---------|---------------|
| Ruby    | 84            |
| Yugesh  | 92            |
| Vishesh | 45            |
| Rakesh  | 72            |



### Section E

34. Consider the following table Student :

Table : STUDENT

| Admn | Name  | Class | Optional | Marks |
|------|-------|-------|----------|-------|
| 1001 | Tony  | 10    | AI       | 90    |
| 1002 | Ivana | 11    | IP       | 95    |
| 1003 | Nick  | 10    | IT       | 85    |
| 1004 | Sandy | 11    | IP       | 80    |
| 1005 | Kavya | 11    | IP       | 92    |



Write SQL queries for the following :

- (a) Display the Total Marks secured by students of each class. 1
- (b) Display the Average Marks secured by the students of IP optional subject. 1
- (c) Display the total number of students in each Class where the number of students are more than 2. 2

**OR**

- (c) Display the maximum and minimum marks secured in each optional subject. 2

**35.** Consider the following DataFrame 'employee':

| EID | EName   | Department | Salary |
|-----|---------|------------|--------|
| 1   | John    | IT         | 50000  |
| 2   | Ria     | MKT        | 45000  |
| 3   | Shobhit | IT         | 55000  |
| 4   | Aditya  | MKT        | 60000  |
| 5   | Rashi   | ADMIN      | 52000  |

- (a) Write Python statements for the DataFrame 'employee':
  - (i) To remove the column 'Salary'. 1
  - (ii) To remove the row having index 4. 1
- (b) Write Python statement to save the DataFrame 'employee' to a CSV file data.csv stored in D:drive of the computer. 2

**OR**

- (b) Write a Python statement to display the new salary i.e., salary increased by 5000 for all employees. 2