Series &RQPS/S

Set-4

Q.P. Code **90/S**

Roll No. | | | | | | | | |

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

INFORMATICS PRACTICES

Time allowed : 2 hours *Maximum Marks : 70*

	NOTE
(I)	Please check that this question paper contains **15** printed pages.
(II)	Please check that this question paper contains **35** questions.
(III)	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.
(IV)	**Please write down the serial number of the question in the answer-book before attempting it.**
(V)	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 :

(i) *This question paper contains five sections,* ***Section A*** *to* ***E****.*

(ii) ***All*** *questions are compulsory.*

(iii) ***Section A*** *has* ***18*** *questions carrying* ***1*** *mark each.*

(iv) ***Section B*** *has* ***7*** *Very Short Answer type questions carrying* ***2*** *marks each.*

(v) ***Section C*** *has* ***5*** *Short Answer type questions carrying* ***3*** *marks each.*

(vi) ***Section D*** *has* ***2*** *questions carrying* ***4*** *marks each.*

(vii) ***Section E*** *has* ***3*** *questions carrying* ***5*** *marks each.*

(viii) ***All*** *programming question are to be answered using Python language only.*

SECTION A

1. What does a modem do at the sender's end ? *1*

(A) It converts analog signals into digital data.

(B) It converts digital data into analog signals.

(C) It converts digital data into optical signals.

(D) It converts optical signals into digital data.

2. Which out of the following ***cannot*** be included in digital footprint ? *1*

(A) Submitting the form online

(B) Searching for your friend's address online

(C) Walking on the beach

(D) Online shopping

3. Emma is a student working on her research project. She finds a well-written paragraph on the Internet that perfectly explains the concept that she wants to include in her project. She copies and pastes the paragraph as it is into her research paper. Her research paper did not get selected due to plagiarism. What is the one way out of the following that Emma could have followed to avoid plagiarism in this case ? *1*

(A) Copying the content from a book in her college library.

(B) Rewriting the paragraph in her own words and citing the original source.

(C) Asking her friends for information and using it in her research paper, without mentioning her friend's input.

(D) Posting the paper on her college website.

4. What will be the output of the following query ? *1*

```
SELECT MOD (5, 15);
```

(A) 10 (B) 3

(C) 0 (D) 5

5. Which of the following aggregate function returns the average of values in a specified column of a MySQL table ? *1*

(A) `AVG(Column)` (B) `AVERAGE(Column)`

(C) `MEAN(Column)` (D) `TOTAL(Column)`

6. For how long does a patent typically protect an invention ? *1*

(A) 5 years (B) 10 years

(C) 20 years (D) 50 years

7. In Pandas library of Python, a one-dimensional array containing a sequence of values of any datatype is known as : *1*

(A) DataFrame (B) Histogram

(C) Series (D) Panel

8. `Now()` in MySQL returns _____. *1*

(A) Today's date (B) Today's date and current time

(C) System's date and time (D) Name of active database

9. What will be the output of the following query ? *1*

```
SELECT SUBSTR("Swachh Survekshan",2,4)
```

(A) `wac` (B) `wach`

(C) `shan` (D) `achh`

10. What will be the output of the following Pythan code ? *1*

```
import pandas as pd

dd={'Jan':31,'Feb':28,'Mar':31,'Apr':30}

rr=pd.Series(dd)

print(rr)
```

(A)
```
Jan 31
Feb 28
Mar 31
Apr 30
dtype: int64
```

(B)
```
Jan  Feb  Mar  Apr
31   28   31   30
dtype: int64
```

(C)
```
Jan - 31
Feb - 28
Mar - 31
Apr - 30
dtype: int64
```

(D)
```
Jan  Feb  Mar  Apr
 |    |    |    |
31   28   31   30
dtype: int64
```

11. With respect to databases, a row in a relation is also known as a/an _____. *1*

(A) Attribute (B) Tuple

(C) Field (D) Domain

12. Which of the following command is used to display first three rows of a DataFrame **'DF'** ? *1*

(A) `DF.head()`

(B) `DF.header()`

(C) `DF.head(3)`

(D) `DF.Head(3)`

13. Which of the following Internet services is used for instant messaging ? *1*

(A) Chat (B) Email

(C) WWW (D) Python

14. What is the output of the following SQL Query ? *1*

```
SELECT INSTR("KNOWLEDGE","E");
```

(A) 7 (B) 5

(C) 6 (D) – 6

15. Which of the following is ***not*** a feature of Open Source Software ? *1*

(A) It can be shared with others without any licensing burden.

(B) It is same as free software.

(C) It can be downloaded on multiple devices.

(D) Its source code is available for free distribution.

16. What is a common symptom of extended use of digital devices these days ? *1*

(A) Improved eyesight

(B) Enhanced physical fitness

(C) Eye strain

(D) Increased muscle strength

17. Assertion (A) : Hacking is a cyber crime.

Reason (R) : To avoid hacking, one should not share the password with anyone.

(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. *1*

18. Assertion (A) : The Pandas library in Python is primarily used for creating static, animated and interactive 2D plots or figures.

Reason (R) : Data visualization can be achieved with the help of a variety of charts and plots, including static plots, animations, and interactive visualizations.

(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. *1*

SECTION B

19. (a) Write one function each for the following network devices : *2*

(i) MODEM

(ii) Router

OR

(b) Write any one advantage and any one disadvantage of BUS topology. *2*

20. The Python code written below has syntactical errors. Rewrite the correct code and underline the correction(s) made. *2*

```
import Pandas as pd

countries=[{'country';'INDIA','capital':'New Delhi'},

           {'country':'USA','capital':'New York'},

           {'country':'JAPAN','capital':'Tokyo'}

df=pd.DataFrame(country)

print(df)
```

21. Consider the string **'PAINTING'**. Write the SQL commands to display the following output : *2*

(i) **ING**

(ii) **INT**

22. Find the output of the following Python code : *2*

```
import pandas as pd

vaccine_qty=pd.Series([10,16,1],index=["Typhoid",
                                       "Tetanus","Hepatitis"])

cost=pd.Series([200,500,800],index=["Typhoid","Tetanus",
                                                  "Flu"])

print(vaccine_qty + cost)
```

23. Define the following terms : *2*

(i) Web Hosting

(ii) WWW

24. Consider the following Python code : *2*

```
import pandas as pan
customer=[{'Name':'Alisha','Age':25,'Gender':'Female',
                                    'Occupation':'Engineer'},
          {'Name':'Rozer','Age':34,'Gender':'Male',______:
                                                'Analyst'},
          {'Name':'Fazal','Age':28,'Gender':'Male',
                                  'Occupation':'Developer'}]
df= __________.DataFrame(__________)
print(__________)
```

Complete the above given Python code to display the following output :

	Name	Age	Gender	Occuptaion
0	Alisha	25	Female	Occupation
1	Rozer	34	Male	Engineer
2	Fazal	28	Male	Developer

25. Write any two differences between **DELETE** and **DROP TABLE** command of MySQL. *2*

SECTION C

26. Consider the table BIKES given below :

Table : BIKES

Bid	Bikename	Brandname	Biketype	Cost
1001	Dream Racer	Speedo	Super	1980000
1002	Splendid	Indiana	NULL	50000
1003	Silver Wing	Indiana	Touring	2300000
1004	ZZZZ	WMV	Sports	1500000
1005	CH2H	Speedo	Super	470000
1006	Astor	Victory	Normal	1700000
1007	CHANDRA	WMV	Adventure	3000000
1008	SWISS	WMV	Touring	4200000
1009	SWIFT	ROADY	Super	1900000
1010	CLOUD9	GEM	Normal	1700000

(a) Write SQL commands for the following : *3*

(i) Display Bikenames and their corresponding Brandnames in descending order of cost.

(ii) Display Brandnames of bikes whose Biketype is not known.

(iii) Consider the following query :

```
SELECT*FROM BIKES WHERE Cost BETWEEN 200000 AND
3000000;
```

Write another query, using relational and logical operators which will produce the same output.

OR

(b) Predict the output of the following queries based on the table BIKES given above : *3*

(i)
```
SELECT UCASE(TRIM(Brandname)) FROM BIKES
WHERE Bid = 1003;
```

(ii)
```
SELECT COUNT(Biketype) FROM BIKES;
```

(iii)
```
SELECT SUM(Cost), Brandname FROM BIKES
GROUP BY Brandname
Having Brandname = "WMV" OR Brandname = "Indiana";
```

27. Sejal, a Python programmer has been given the following tasks :

(i) Create two series – one to store various product names and the other to store the corresponding price.

Each series should have appropriate row label as given below :

	Product_name	Product_price
B1001	Butterscotch	130
V3002	Vanilla	100
M4002	Mango Zap	150
M4007	Magnum	190
C6005	Cassatta	200

(ii) Create a dictionary containing 'Product_name' and 'Product_price' as keys. Add the series created in part (i) as their corresponding values.

(iii) Create a DataFrame from the above created dictionary of series.

Help her in writing the Python program to accomplish the above mentioned tasks. *3*

28. Answer the following questions based on the table Sales given below :

Table : Sales

id	Name	City	Commission
E001	Naman Batra	Chandigarh	20
E002	Rupesh Mann	Delhi	15
E005	Ravi Gautam	Mumbai	25
E006	Mukul Singh	Delhi	30
E007	Ruby Rai	Mumbai	19
E003	Raman Roy	Kolkata	16

(i) Suggest the Primary key for the given table ?

(ii) Write the SQL command to insert the following data in the table Sales :

id → E009

Name → Sukumar

City → Nagpur

Commission → 10

(iii) Is the command used in part (ii) a DDL or a DML command ? *3*

29. (a) Sarah works in a multinational IT firm. One day, she came to know that some mails were sent from her official mail account but she had not actually sent them. *3*

Based on the given information, answer the following questions :

(i) Sarah is a victim of which type of cybercrime ?

(ii) Write any two precautions that one should take to protect oneself from being the victim of cybercrime.

(iii) Should Sarah immediately change the password of her email account ?

OR

(b) At a local electronics store, a new range of smartphones has been launched, creating a buzz among technology enthusiasts. However, the introduction of these new devices has also raised concerns about the increasing generation of e-waste in the community.

Answer the following questions based on above extract : *3*

(i) Define e-waste.

(ii) Give any one environmental challenge posed by e-waste, including its impact on air, water, and soil quality.

(iii) Imagine you are a part of a local environment organization. Provide any two strategies that could be implemented to minimize the negative environmental effects of e-waste.

30. Consider the following DataFrame Cricket :

	Won	Lost	Played
A	9	11	20
B	12	5	17
C	10	6	16
D	7	7	14
E	6	6	12

Write suitable Python statements to perform the following tasks : *3*

(i) Add a new column Rating to the DataFrame having the following values : `3, 1, 2, 4, 5`

(ii) Change the row labels from `A, B, C, D, E to Team A, Team B, Team C, Team D` and `Team E`.

(iii) Change the column label of first column from `'Won'` to `'Matches won'`.

SECTION – D

31. Ms. Sridevi is a placement head in a reputed engineering institute and has created the following table to store the records of students getting placement in various companies :

Table : Placement

Compid	Company Name	Vacancies	Appeared	Department	DoJ	City
CP01	Rising Star	20	300	Networking	2020-07-02	Bengaluru
CP02	Smoke Ring	30	350	Web Development	2019-07-12	Chennai
CP03	Pilot	15	421	Cloud	2020-08-12	Bengaluru
CP04	Jingle	10	145	Servers	2019-01-23	Hyderabad
CP05	Neel Zone	17	568	Data Analytics	2018-09-02	Bengaluru
CP06	Hard Talk	12	276	Marketing	2020-07-02	Hyderabad

Based on the given table, help Ms. Sridevi to write SQL queries for performing the following tasks : *4*

(i) To list names of those companies where department is either Marketing or Networking.

(ii) To display the joining month name for Rising Star company.

Ms. Sridevi has written following queries. Write the output of each query :

(iii) `SELECT LEFT (CompanyName, INSTR(CompanyName,"R")) FROM Placement where vacancies >=20;`

(iv) `SELECT CompanyName FROM Placement WHERE Vacancies < 20 AND Appeared >300;`

32. Ms. Shambhavi, a data analyst working on a college admission project, has created the following DataFrame Sub_Details to store subjectwise details :

	Subject	Total Students	Seat Availability
1	English	50	No
2	IT	45	Yes
3	AI	40	Yes
4	CS	50	No
5	CA	47	Yes

Help her by answering the following questions : *4*

(i) Write suitable Python command to display the row having index value 3.

(ii) Predict the output of the following Python statement :

```
print(Sub_Details.loc[2:3,'Total Students'])
```

(iii) (a) Write suitable Python statement to display the list of various subjects along with their corresponding seat availability.

OR [option for part (iii) only]

(b) Ms. Shambhavi has just created a folder named Project in the E: drive of her computer to store necessary files related to the project. Write suitable Python statement to export the given DataFrame into the file stud.csv, created inside project folder in E: drive.

SECTION – E

33. Consider the tables Faculty and Batch given below :

Table : Faculty

F_Id	FacName	DoJ	Qualification	Salary
Emp01	Neeta Khanna	2013-07-01	MCA	85000
Emp02	Sonia Chawla	2023-05-05	MA	35000
Emp03	Sheetal	2015-06-28	MSc	90000
Emp04	Bindu	2016-03-30	M.Com	80000
Emp05	Sunidhi	2002-06-28	BA	100000
Emp06	Ashish	1999-07-01	B.Com	120000

Table : Batch

Batchid	BatchName	F_Id	Daysperweek	Subjects
B01	TXAlpha	Emp01	3	English
B02	TXBeta	Emp05	5	Chemistry
B03	TXGama	Emp02	4	Physics
B04	Super30	Emp03	3	Mathematics
B05	G-20	EMp04	2	Economics
B06	LXAlpha	Emp01	4	Accountancy

Write SQL queries for the following : *5*

(a) (i) Display name and salary of all faculties in alphabetical order of their names.

(ii) Display details of faculties who joined on Monday.

(iii) Display names of faculties, their salary and BatchName from both the tables.

(iv) Display the details of all faculties whose salary is more than 60000 and have joined before the year 2007.

(v) Display the name of faculty who is taking **TXAlpha Batch**.

OR

(b) (i) Display maximum days per week for each F_Id from the table Batch.

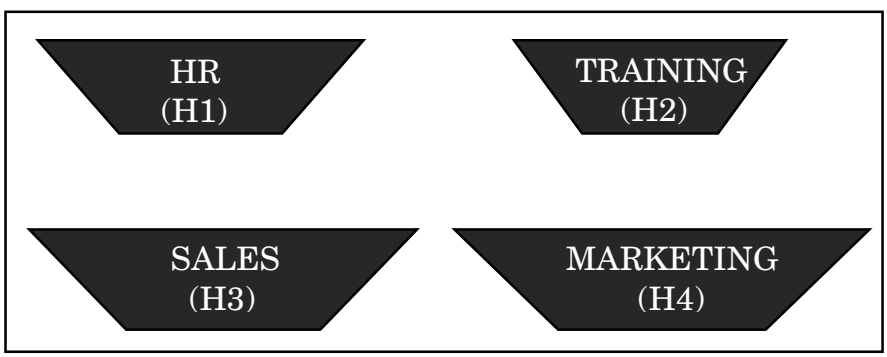
(ii) Display names of faculties after removing leading and trailing spaces.

(iii) Display total number of records in the table Faculty.

(iv) Increase the salary by 25% of those employees whose qualification is MCA.

(v) Delete the records of batches whose subject is English.

34. Classpoint Pvt. Ltd., Pune is a company that deals with development and training of software. They have different divisions HR (H1), Training (H2), Sales (H3) and Marketing (H4). The layout of the Pune branch is :



The management wants to connect all the divisions as well as all the computers of each division (H1, H2, H3 and H4).

Distance between the divisions are as follows :

H1 to H2	**90m**
H1 to H3	**145m**
H1 to H4	**88m**
H2 to H3	**110m**
H2 to H4	**80m**
H3 to H4	**160m**

Number of computers in each division :

Division	Number of Computers
H1	**100**
H2	**220**
H3	**160**
H4	**140**

Based on the above specifications, answer the following questions : *5*

(i) Suggest the topology and draw the most suitable cable layout for connecting all the divisions.

(ii) Classpoint Pvt. Ltd. plans to establish a new office in Dubai. Out of LAN, MAN and WAN, what kind of network will be created to connect Pune office with Dubai office ?

(iii) Suggest the division for the placement of server in Pune office. Explain the reason for your selection.

(iv) Suggest the placement of switch/hub with justification.

(v) Ms. Abhilasha, working in Dubai office, is creating a software for conducting program for the employees of Pune branch. Which protocol would help her in voice transmission over a computer network ?

35. (a) Akriti keeps the calorie count of different food items as follows :

```
Food=['Apple','Banana','Rice','Wheat','Carrot']

Calorie=[72,105,204,455,52]
```

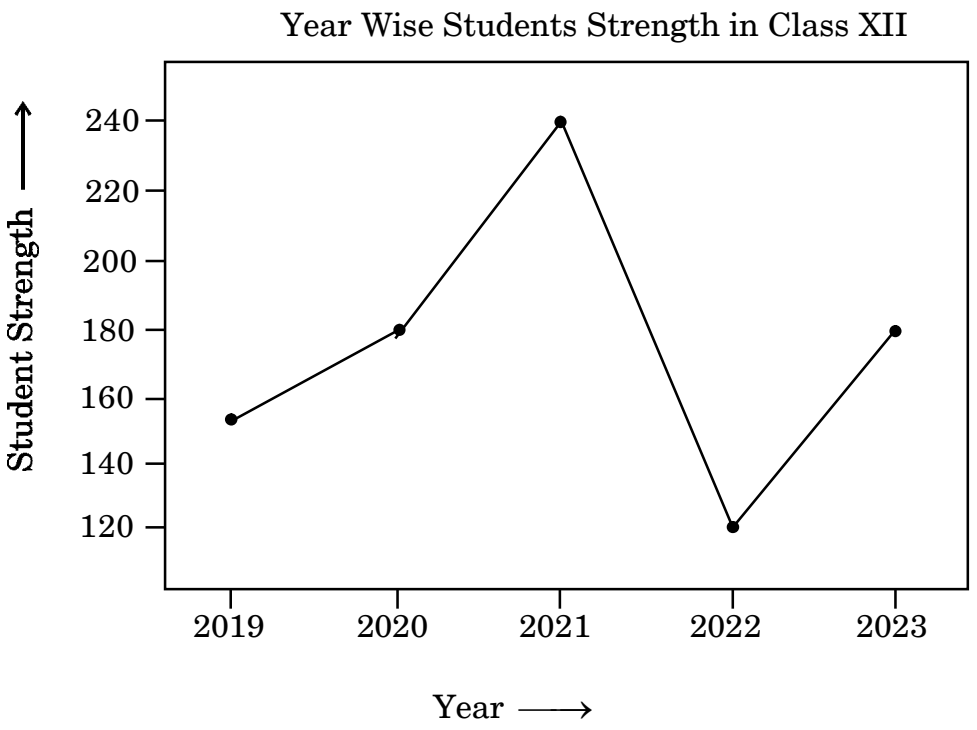
Write a Python code to generate a Bar Chart on the given data, having suitable Chart Title and labels for X and Y axis. Also add suitable statement to save this chart with the name **`calorie.png`**. *5*

OR

(b) Consider the following data :

Year	Student Strength
2019	150
2020	180
2021	240
2022	120
2023	180

Write a Python code to draw the following line chart having title and labels for x and y axis as shown below : *5*



Also give suitable Python statement to save this chart with name, **`stud.png`**.