रोल नं.
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 **11** 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 candidates 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 have 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 3 Long Answer type questions carrying 5 marks each.

    (vii) Section E has 2 questions carrying 4 marks each. One internal choice is given in Q. 35 against Part E only.

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

Part – A

1. Which of the following topologies is very efficient and all nodes are connected to a central hub ?   1

    (i)   Star   (ii) Tree

    (iii) Bus   (iv) Ring

2. Ramandeep is a young woman with great aspirations and has a good team of like-minded people. She along with her team members started a company to sell handicrafts online and also designed a logo for their company. What type of intellectual property does this logo represent ?   1

    (i)   Patents   (ii) Copyright

    (iii) Design   (iv) Trademark

3.. Which of the following is a type of cybercrime where objectionable and demeaning comments are posted on social media platform about a person, such that he/she is mentally harassed ?   1

    (i)   Phishing   (ii) Hacking

    (iii) Cyber bullying   (iv) Identity Theft

4. Which of the following is the correct output of the following SQL command ? 1

    SELECT ROUND (7876.4568, 2) ;

    (i)   .7876.46   (ii) 7876.45

    (iii) 7900   (iv) 7900.4568

5. Aggregate functions are also known as :   1

    (i)   Scalar Functions   (ii) Single Row Functions

    (iii) Multiple Row Functions   (iv) Hybrid Functions

6. Primary law in India for matters related to e-commerce and cyber crime is : 1
   (i)   IT Act 1995   (ii) IT Act 2000
   (iii) IT Act 1998   (iv) IT Act 2010

7. Ravisha has stored the records of all students of her class in a MYSQL table. Suggest a suitable SQL clause that she should use to display the names of students in alphabetical order. 1
   (i)   **SORT BY**   (ii) **ALIGN BY**
   (iii) **GROUP BY**   (iv) **ORDER BY**

8. To remove the leading and trailing space from data values in a column of MySql Table, we use 1
   (i)   **Left( )**   (ii) **Right( )**
   (iii) **Trim( )**   (iv) **Ltrim( )**

9. If the substring is not present in a string, the **INSTR( )** returns : 1
   (i)   − 1   (ii) 1
   (iii) NULL   (iv) 0

10. What will be the output of the following code ? 1
    ```
    import pandas as pd
    myser = pd.Series([0, 0,0])
    print(myser)
    ```
    (i)   0   0   (ii) 0   1
          0   0   0   1
          0   0   0   2
    (iii) 0   0   (iv) 0   0
          1   0   1   1
          2   0   2   2

11. Which of the following is a two-dimensional labelled data structure of Python ? 1
    (i)   Relation   (ii) Dataframe
    (iii) Series   (iv) Square

12. To compare data values of commission earned by salesmen over a year, which of the following type of graph should preferably be used ? 1
    (i)   line   (ii) area
    (iii) bar   (iv) scatter

13. Which of the following is **not** a web browser ?   1
    (i)   Opera   (ii) Google Chrome
    (iii) Linux   (iv) Mozilla Firefox

14. Which of the following is not a valid aggregate function in MYSQL ?   1
    (i)   **COUNT ( )**   (ii) **SUM ( )**
    (iii) **MAX ( )**   (iv) **LEN ( )**

15. The digital footprint that we leave online unintentionally is called   1
    (i)   Active digital footprint   (ii) Passive digital footprint
    (iii) True digital footprint   (iv) False digital footprint

16. E-waste is responsible for the degradation of our environment if not
    properly treated or disposed of. Some of the feasible methods of e-waste
    management are reduce, _____ and recycle.   1
    (i)   reuse   (ii) recheck
    (iii) resubmit   (iv) regular
    Q. 17 and 18 are ASSERTION (A) and REASONING (R) based questions.
    Mark the correct choice as
    (i)   Both (A) and (R) are true and (R) is the correct explanation for (A).
    (ii) Both (A) and (R) are true and (R) is not the correct explanation for
          (A).
    (iii) (A) is true and (R) is false.
    (iv) (A) is false but (R) is true.

17. **Assertion (A) :** A static webpage does not change for each person visiting
    the web page.   1
    Reason (R) : When a web server receives a request for a dynamic web
    page, it locates and updates the page and sends it to the browser of
    the client.

18. **Assertion (A) :** The output of addition of two series will be NaN, if one of
    the elements or both the elements have no value(s).   1
    Reason (R) : While performing mathematical operations on a series, by
    default all missing values are filled in with 0.

PART – B
19. What is a web server ? How is it different from web browser ?   2
                                    OR

    What do you understand by the term cookies ? Give any two benefits of
    cookies.   2

20. Keshav has written the following query to find out the sum of bonus earned by the employees of WEST zone :

    SELECT zone, TOTAL (bonus) FROM employee HAVING zone = 'WEST';

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

21. Differentiate between **COUNT ( )** and **COUNT (*)** functions in **MYSQL**. Give suitable examples to support your answer. **2**

22. Write a Python program to create a series object, **country** using a list that stores the capital of each country.

    Note : Assume four countries to be used as index of the series object are India, UK, Denmark, and Thailand having their capitals as New Delhi, London, Copenhagen, and Bangkok respectively. **2**

23. Explain plagiarism with an example. **2**

    OR

    Nowadays all of us frequently use social media to connect with our friends. Give any two netiquettes that we should follow while communicating on social media. **2**

24. What will be the output of the following code : **2**

```
import pandas as pd
s1=pd.Series(data=2*(3,10))
print(s1)
```

25. Carefully observe the following code : **2**

```
import pandas as pd
dic={'pid':[101, 102, 103, 104, 105],
'pname':['Shyam','Roushan','Archit','Medha','Lalit'],
'sports':['Cricket','Tennis','Football','Cricket','Cricket'],
'points':[45000,20000,15000,53000,60000]}
player=pd.DataFrame(dic)
print(player)
```

    Write Python statements for the following :

    (i) In the dataframe player created above, set the row labels as 'Player1', 'Player2', 'Player3', 'Player4', 'Player5'.

    (ii) Rename the column 'points' to 'netpoint' in the DataFrame player.

SECTION – C

26. Consider the table Patient given below and write SQL commands.

Table : Patient

Patientid	Name	City	Phone	Dateofadm	Department
1000001	Ritvik Garg	Delhi	68476213	2021-12-10	Surgery
1000002	Rahil Arora	Mumbai	36546321	2022-01-08	Medicine
1000003	Mehak Bhatt	Delhi	68421879	2022-02-02	Cardiology
1000004	Soumik Rao	Delhi	26543266	2022-01-11	Medicine
1000005	Suresh Sood	Bangalore	65432442	2021-03-09	Surgery

(i) Display the details of all patients who were admitted in January.

(ii) Count the total number of patients from Delhi.

(iii) Display the last 2 digits of the Patientid of all patients from Surgery Department.   3

27. Kavyanjali, a chemical analyst, needs to arrange data of few elements in the form of two series containing symbols and their atomic numbers respectively. Thereafter, the data of these two series has to be arranged and displayed in the form of Data Frame as shown below :

	Symbol	Atomic Number
Hydrogen	H	1
Helium	He	2
Lithium	Li	3
Beryllium	Be	4

Help her in writing suitable Python code to complete the task.   3

28. Consider the given DataFrame 'health'.   3

	Diseasename	Agent
0	Common cold	Virus
1	Chickenpox	Virus
2	Cholera	Bacteria
3	Tuberculosis	Bacteria

Write suitable Python statements for the following :

(i) Remove the row containing details of disease named Tuberculosis.

(ii) Add a new disease named 'Malaria' caused by 'Protozoa'.

(iii) Display the last 2 rows.

29. Manohar received an email from a company, named Makemoney Pvt. Ltd., claiming that Manohar has won ₹20 lakhs in a survey done online. In order to claim the prize money, he was required to answer few security questions such as his Name, Account number, PAN card details, Phone number and OTP for verification purposes. For this, he had to click on the link provided in the email.

Answer the following questions :

(i) Should Manohar give the required details to the company ?

(ii) What is the activity depicted above ?

(iii) What should he do with this email ? **3**

OR

What do you understand by the term Hacking ? Write any two measures that one should take to avoid being the victim of hacking. **3**

30. Write the output (i-iii) for the following SQL commands. **3**

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;`

OR

Find the output of the following SQL queries : **3**

(i) `SELECT SUBSTR("CLIMATE CHANGE",4,4);`

(ii) `SELECT UCASE(RIGHT("Pollution",3));`

(iii) `SELECT LENGTH("HAPPY")+3;`

SECTION – D

31. Write the SQL queries which will perform the following operations : **5**

(i) To display the year from your Date of Admission which is '2023-05-15'.

(ii) To convert your email id 'ABC@XYZ.com' to lowercase.

(iii) To remove leading spaces from a string ' my country '.

(iv) To display current date.

(v) To display the value of 10^6.

OR

Consider a table PRODUCT with the following data :

Table : PRODUCT

SNO	Itemname	Company	Stockdate	Price	Discount
1	Monitor	HP	2021-12-20	15499.739	15
2	Webcam	Logitech	2020-02-03	4890.90	5
3	Keyboard	Logitech	2022-08-19	1878.985	30
4	Mouse	HCL	2021-05-16	1200.00	7
5	Speakers	iBall	2021-10-19	NULL	25

Write SQL queries using SQL functions to perform the following operations :

(i) Display the first 3 characters of all Itemnames.

(ii) Display the names of all items whose Stockday is "Monday".

(iii) Display the total price of all the products.

(iv) Display the maximum Price.

(v) Display the average Price of all the products by the company named 'Logitech'.

5

32. XEED Private Ltd., Delhi is a company that deals with educational toys. They have different divisions HR (A1), Sales (A2), Production (A3) and Marketing (A4).

The layout of the Delhi branch is :

5
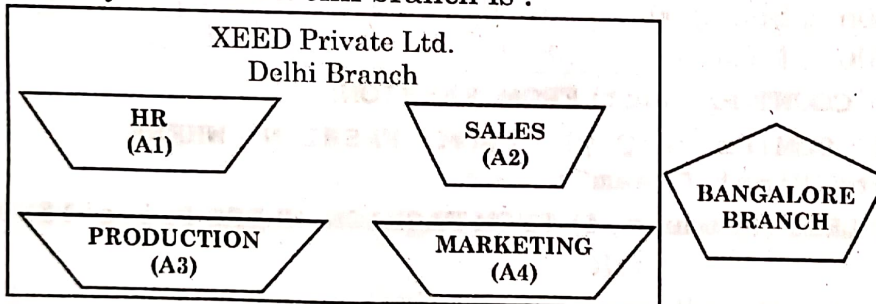
The company also has a branch in Bangalore. The management wants to connect all the divisions as well as all the computers of each division (A1, A2, A3, A4).

Distance between the wings are as follows :

A3 to A1	25 m
A1 to A2	40 m
A2 to A4	25 m
A4 to A3	20 m
A3 to A2	30 m
A1 to A4	170 m
Delhi Head Office to Bangalore Office	2154 km

Number of computers in each of the wing :

A1	50
A2	40
A3	110
A4	60

Based on the above specifications, answer the following questions :

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

(ii) Suggest the kind of network required (out of LAN, MAN, WAN) for connecting Production (A3) with the Bangalore branch.

(iii) Which device can be used to connect the network of Delhi Branch to the Internet ? This device should be able to receive data, analyse it and then transmit it to the network.

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

(v) Many employees were finding it difficult to cope up with work pressure and hence were showing stress related symptoms. In order to improve the mental health of its employees, HR planned to conduct an online session with a mental health expert from Mumbai. Out of the options given below, suggest the protocol that will help to send the voice signals over internet to conduct the session successfully.

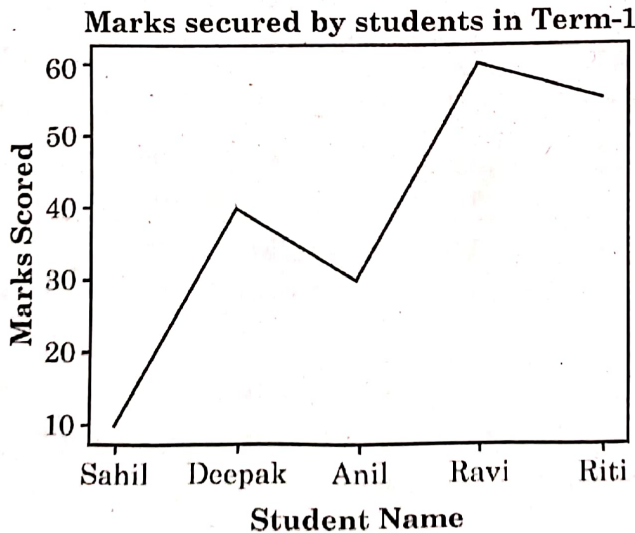   (a) FTP   (b) SMTP   (c) VOIP   (d) POP

33. Consider the following graph. Write the Python code to plot it. Also add the Title, label for X and Y axis.   **5**

Use the following data for plotting the graph

smarks=[10,40,30,60,55]

sname=["Sahil", "Deepak", "Anil", "Ravi","Riti"]

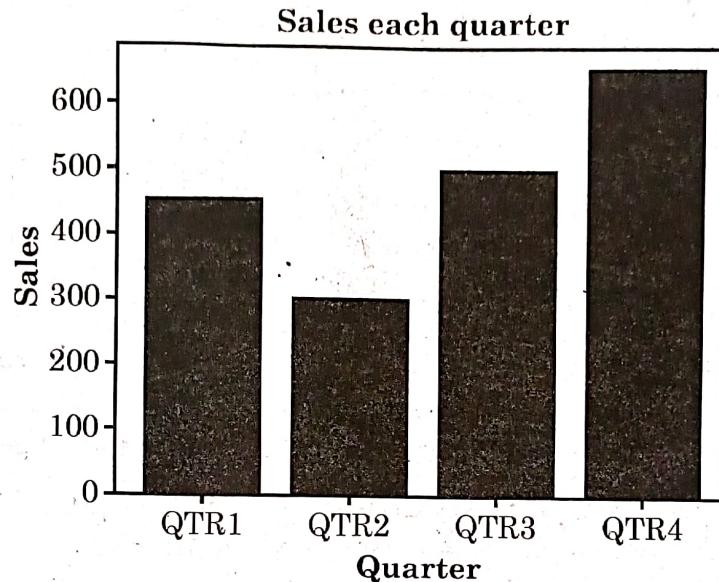**Marks secured by students in Term-1**

OR

Write Python code to draw the following bar graph representing the total sales in each quarter. Add the Title, Label for X-axis and Y-axis.

Use the following data for plotting the graph :   5

sales=[450,300,500,650]

qtr=["QTR1", "QTR2", "QTR3", "QTR4"]

Sales each quarter

SECTION – E

34. Consider the following table **Schooldata**:   1+1+2

Table: Schooldata

Admno	Name	Grade	Club	Marks	Gender
20150001	Sargam Singh	12	STEM	86	Male
20140212	Alok Kumar	10	SPACE	75	Male
20090234	Mohit Gaur	11	SPACE	84	Male
20130216	Romil Malik	10	READER	91	Male
20190227	Tanvi Batra	11	STEM	70	Female
20120200	Nomita Ranjan	12	STEM	64	Female

Write SQL queries for the following :

(i)   Display the average Marks secured by each Gender.

(ii) Display the minimum Marks secured by the students of Grade 10.

(iii) Display the total number of students in each Club where number of students are more than 1.

OR

(iii) Display the maximum and minimum marks secured by each gender. **2**

35. Consider the following DataFrame 'mdf'. **1 + 1 + 2**

	Rollno	Name	English	Hindi	Maths
0	1	Aditya	23	20	28
1	2	Balwant	18	1	25
2	3	Chirag	27	23	30
3	4	Deepak	11	3	7
4	5	Eva	17	21	24

(A) Write Python statements for the DataFrame 'mdf' :

(i) To display the records of the students having roll numbers 2 and 3.

(ii) To increase the marks of subject Math by 4, for all students.

(B) Write Python statement to display the Rollno and Name of all students who secured less than 10 marks in Maths.

OR

(Option for Part B only)

Write Python statement to display the total marks i.e., sum of marks secured in English, Hindi and Maths for all students. **2**