CBSE
Solved Paper 2025
Informatics Practices
Class-12th
(Delhi & Outside Delhi Set)

Time : 3 Hours **Max. Marks : 70**

General Instructions :

(i) *Please check 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 case study type questions (33 & 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 MCQs, text of the correct answer should also be written.*

SECTION - A

(All Questions are compulsory.)

1. State whether the following statement is True or False : **1**

In Python, we cannot create an empty DataFrame.

2. What will be the output of the following SQL command ? **1**

```
SELECT MONTHNAME ('2024-08-02');
```

(A) 08 (B) 02

(C) February (D) August

3. Temporary data files stored by websites in our computer can be used to track our online activities and also to personalize browsing experience. These files are known as: **1**

(A) Plug-ins (B) Add-ons

(C) Cookies (D) Bookmarks

4. Which of the following is not an aggregate function in SQL? **1**

(A) `COUNT(*)` (B) `MIN ()`

(C) `LEFT ()` (D) `AVG ()`

5. Raheem created a unique computer software and wants to protect his creation from being copied or used without his permission. He is considering to apply for legal protection. Which type of intellectual property protection should Raheem apply for, to safeguard his software? **1**

(A) Copyright (B) Plagiarism

(C) Trademark (D) Lease

6. What is the default index type for a Pandas Series if not explicitly specified? **1**

(A) String (B) List

(C) Numeric (D) Boolean

7. In Python which function of **matplotlib** library is used to save a plot ? **1**

(A) **save()** (B) **saveplot()**

(C) **export()** (D) **savefig()**

8. State whether the following statement is True or False: **1**

The **MOD()** function in SQL returns the quotient of division operation between two numbers.

9. Which of the following data structures is used for storing one-dimensional labelled data in Python Pandas? **1**

(A) Integer (B) Dictionary

(C) Series (D) DataFrame

10. Priya received an email that appeared to be from her bank, asking her to update her account information by clicking on a link. She clicked the link to enter her details, but immediately after, some amount was debited from her account. What type of cybercrime did Priya fall victim to ? **1**

(A) Cyber stalking (B) Phishing

(C) Fishing (D) Cyber bullying

11. Which SQL function calculates a^b? **1**

(A) **MOD()** (B) **X POWER()**

(D) **ROUND()** (C) **RAISE()**

12. Which protocol is used while communicating through video calls on the Internet? **1**

(A) Video Over Internet Protocol (B) Voice Over Internet Protocol

(C) Internet Protocol (D) Video Audio Over Internet Protocol

13. Which of the following Python statements will be used to select a specific element having index as **points**, from a Pandas Series named **ser**?

(A) **ser.element(points)** (B) **ser.select (points)**

(C) **ser[points]** (D) **ser.show[points]**

14. Excessive screen time and poor posture can lead to: **1**

(A) Faster Internet speeds (B) Eye strain and other health issues

(C) Better vision and bone density (D) Improved physical health

15. Which of the following libraries defines an ndarray in Python ? **1**

(A) **pandas** (B) **numpy**

(C) **matplotlib** (D) **scipy**

16. With respect to SQL, match the function given in column-II with categories given in column-I: **1**

	I		II
(i)	Math function	(a)	**COUNT()**
(ii)	Aggregate function	(b)	**ROUND ()**
(iii)	Date function	(c)	**RIGHT ()**
(iv)	Text function	(d)	**YEAR ()**

Options:

(A) (i)-(c), (ii)-(d), (iii)-(a), (iv)-(b) (B) (i)-(b), (ii)-(a), (iii)-(d), (iv)-(c)

(C) (i)-(d), (ii)-(b), (iii)-(a), (iv)-(c) (D) (i)-(b), (ii)-(c), (iii)-(d), (iv)-(a)

17. Which of the following Python statements is used to change a column label in a DataFrame, **df**? **1**

(A) **df = df.rename({old_name: new_name}, axis='columns')**

(B) **df = df.rename(old_name, new_name), axis='columns'**

(C) **df = df.change_name(old_name, new_name, axis='bar')**

(D) df df.update({old_name: new_name}, axis='bar')

18. In Python Pandas, **DataFrame ._____ []** is used for label indexing with DataFrames. **1**

(A) **label** (B) **index**

(C) **labindex** (D) **loc**

19. Every web page on the Internet has a unique address. This address is known as: **1**

(A) Domain Name (B) Protocol

(C) Uniform Resource Locater (D) Network Topology

Q. 20 and Q. 21 are Assertion (A) and Reason (R) type questions. Choose the correct option as:

(A) Both Assertion (A) and Reason (R) are True and Reason (R) is the correct explanation for Assertion (A).

(B) Both Assertion (A) and Reason (R) are True and Reason (R) is not the correct explanation for Assertion (A).

(C) Assertion (A) is True and Reason (R) is False.

(D) Assertion (A) is False, but Reason (R) is True.

20. **Assertion (A):** The `drop()` method in Pandas can be used to delete rows and columns from a DataFrame.

Reason (R): The axis parameter in the `drop()` method specifies whether to delete rows `(axis=0)` or columns `(axis=1)`. **1**

21. **Assertion (A):** The `ROUND()` function in SQL can be used to round off a number to a specified number of decimal places.

Reason (R): The `ROUND()` function is a string function that accepts character values as input and returns numerical values as output. **1**

SECTION-B

22. (a) Mention any two main points of difference between Series and DataFrame of Python Pandas.

OR

(b) Explain how we can access elements of a series using slicing. Give an example to support your answer.

23. A small tech startup, is considering using open source software to develop their new project management tool. They are evaluating the benefits and potential challenges of adopting open source solutions.

(i) Identify one key benefit of using open source software for the development of project management tool.

(ii) Give any two examples of open source software.

24. Consider the string, `"Informatics Practices"`. Write suitable SQL queries for the following: **2**

(i) To convert the entire string to uppercase.

(ii) To display the total number of characters in the given string.

25. **(a)** Give any two points of difference between Static web page and Dynamic web page. **2**

OR

(b) Describe the role of a router in a network. **1**

26. What is a Database Management System (DBMS) ? Mention any two examples of DBMS.

27. Give any two impacts on environment that are caused when e-waste is carelessly thrown or dumped in landfills or dumping grounds.

28. **(a)** Rohit is trying to create a Pandas Series from scalar values. His code has some mistakes. Rewrite the correct code and underline the corrections made. **2**

```
import pandas
data = [50, 15, 40]
series = pd.series (data, Index=['x', 'y', 'z'])
Print(series)
```

OR

(b) Complete the given Python code to generate the following output:

```
     COLOUR   NAME     QTY
0    Red      Apple    10
1    Blue     Berry    15
2    Green    Guava    20
```

```
import _______ as pd
data=[{'COLOUR': 'Red', 'NAME': 'Apple',  'QTY':10},
{'COLOUR': 'Blue', 'NAME': ' Berry', ' QTY':15},
{_______, 'NAME' : ' Guava', 'QTY':20}]
df-pd.DataFrame (__________)
print (________)
```

SECTION - C

29. Ravi is a student studying in grade 12. He frequently uses the internet for various activities such as social networking, online shopping, and to research for school projects. Recently, he noticed that he receives targeted advertisements based on his browsing history and is concerned about his digital footprint. Additionally, Ravi has encountered instances of cyberbullying and is unsure how to handle them. Help Ravi by answering the following questions: **3**

(i) What are digital footprints, and how are they created?

(ii) Write any two net etiquettes that Ravi should follow to ensure respectful and responsible online behavior.

(iii) How can Ravi protect himself from cyberbullying? Mention any one protective measure.

30. (a) Write a Python program to create the following DataFrame using a Dictionary of Series:

	City	State
0	Mumbai	Maharashtra
1	Dehradun	Uttarakhand
2	Bengaluru	Karnataka
3	Hyderabad	Telangana

OR

(b) Write a Python program to create a Pandas Series as shown below from an ndarray containing the numbers `10, 20, 30, 40, 50` with corresponding indices `'A', 'B', 'C', 'D', 'E'`.

A	10
B	20
C	30
D	40
E	50

31. (i) Write the SQL statement to create a table, `Customer` with the following specifications: **(2+1)=3**

Table: Customer

Column Name	Data Type	Key
`CID`	`Int`	`Primary Key`
`FName`	`Varchar(20)`	
`LName`	`Varchar(20)`	
`Age`	`Int`	

(ii) Write the SQL query to display all records in descending order of `LName` from the Table `Customer`

32. (a) Given the following tables: **3**

Table: STUDENTS

S_ID	NAME	AGE	CITY
1	Rahul	20	Delhi
2	Priya	22	Mumbai
3	David	21	Delhi
4	Neha	23	Bengaluru
5	Khurshid	22	Delhi

Table: GRADES

S_ID	SUBJECT	GRADE
1	Math	A
2	English	B
3	Math	C
4	English	A
5	Math	B

Write SQL queries for the following:

(i) To display the number of students from each city.

(ii) To find the average age of all students.

(iii) To list the names of students and their grades.

OR

(b) Consider the following tables: 3

Table 1: PRODUCTS

This table stores the basic details of the products available in a shop.

PID	PName	Category
201	Laptop	Electronics
202	Chair	Furniture
203	Desk	Furniture
204	Smartphone	NULL
205	Tablet	Electronics

Table 2: SALES

This table records the number of units sold for each product.

SaleID	PID	UnitsSold
301	201	50
302	202	100
303	203	60
304	204	80
305	205	70

Write SQL queries for the following:

(i) To delete those records from table **`SALES`** whose **`UnitsSold`** is less than 80.

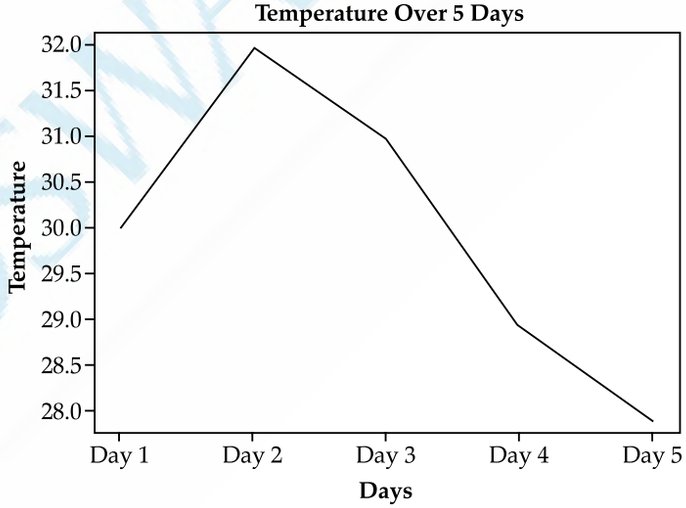
(ii) To display names of all products whose category is not known.

(iii) To display the product names along with their corresponding units sold.

SECTION-D

33. Gurkirat has to fill in the blanks in the given Python program that generates a line plot as shown below. The given line plot represents the temperature (in degree Celcius) over five days as given in the table: 4

Days	Temperature
Day 1	30
Day 2	32
Day 3	31
Day 4	29
Day 5	28



```
import _______as plt # Statement-1
days = ['Day 1', 'Day 2', 'Day 3', 'Day 4', 'Day 5']
temp = [30, 32, 31, 29, 28]
plt. ____ (days, temp) # Statement-2
plt.xlabel('_______ ') # Statement-3
plt.ylabel('Temperature')
plt.title('_______') # Statement-4
plt.show()
```

Write the missing statements according to the given specifications:

(i) Write the suitable code to import the required module in the blank space in the line marked as Statement-1.

(ii) Fill in the blank in Statement-2 with a suitable Python function name to create a line plot.

(iii) Refer to the graph shown and fill in the blank in Statement-3 to display the appropriate label for x-axis.

(iv) Refer to the graph shown and fill in the blank in Statement-4 to display the suitable chart title.

34. (a) An educational institution is maintaining a database for storing the details of courses being offered. The database includes a table COURSE with the following attributes:

C_ID: Stores the unique ID for each course.

C_NAME: Stores the course's name.

INSTRUCTOR: Stores the name of the course instructor.

DURATION: Stores the duration of the course in hours.

Table: COURSE

C_ID	C_NAME	INSTRUCTOR	DURATION
C101	Data Structures	Dr. Alok	40
C102	Machine Learning	Prof. Sunita	60
C103	Web Development	Ms. Sakshi	45
C104	Database Management	Mr. Suresh	50
C105	Python Programming	Dr. Pawan	35

Write SQL queries for the following:

(i) To add a new record with following specifications:

```
C_ID        : C106
C_NAME      : Introduction to AI
INSTRUCTOR  : Ms. Preeti
DURATION    : 55
```

(ii) To display the longest duration among all courses.

(iii) To count total number of courses run by the institution.

(iv) To display the instructors' name in lower case.

OR

(b) Ashutosh, who is a manager, has created a database to manage employee records. The database includes a table named EMPLOYEE whose attribute names are mentioned below:

EID: Stores the unique ID for each employee.

EMP_NAME: Stores the name of the employee.

DEPT: Stores the department of the employee.

SALARY: Stores the salary of the employee.

JOIN_DATE: Stores the employee's joining date.

Table: **EMPLOYEE**

EID	EMP_NAME	DEPT	SALARY	JOIN_DATE
E01	ARJUN SINGH	SALES	75000	2019-11-01
E02	PRIYA JAIN	ENGINEERING	85000	2020-05-20
E03	RAVI SHARMA	MARKETING	60000	2018-08-14
E04	AYESHA	NULL	50000	2021-01-10
E05	RAHUL VERMA	FINANCE	40000	2017-06-25

Write the output of the following SQL Queries:

(i) `Select SUBSTRING (EMP_NAME, 1, 5) from EMPLOYEE where DEPT = 'ENGINEERING';`

(ii) `Select EMP NAME from EMPLOYEE where month (JOIN_DATE) = 8;`

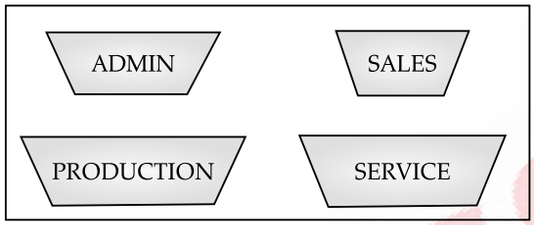
(iii) `Select EMP_NAME from EMPLOYEE where SALARY > 60000;`

(iv) `Select count (DEPT) from EMPLOYEE;`

SECTION-E

35. XYZ Technologies, Hyderabad is a company that deals with data science and AI projects. They have different divisions ADMIN, SALES, PRODUCTION and SERVICE. **5**

The layout of the Hyderabad branch is :



The management wants to connect all the divisions as well as the computers of each division (ADMIN, SALES, PRODUCTION and SERVICE).

Distance between the divisions is as follows:

ADMIN to SALES	69 m
ADMIN to PRODUCTION	84 m
ADMIN to SERVICE	60 m
SALES to PRODUCTION	110 m
SALES to SERVICE	135 m
PRODUCTION to SERVICE	90 m

Number of computers in each division:

Division	Number of Computers
ADMIN	40
SALES	75
PRODUCTION	120
SERVICE	20

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 in the Hyderabad office.

(ii) XYZ Technologies is having its head office in USA. Out of LAN, MAN and WAN, which kind of network will be created to connect Hyderabad office with USA Office? Justify your answer.

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

(iv) Suggest the placement of Switch/Hub with justification.

(v) Where will a repeater be placed in the suggested network layout ? Justify your answer.

36. Consider the DataFrame Doctor shown below: **5**

	DID	Name	Department	Fee
0	101	Dr. Joe	ENT	1500
1	102	Dr. Salma	UROLOGY	1600
2	103	Dr. Jeet	ORTHO	1550
3	104	Dr. Neha	ENT	1200
4	105	Dr. Vikram	ORTHO	1700

Write suitable Python statements for the following:

(i) To print the last three rows of the DataFrame `Doctor`.

(ii) To display the names of all doctors.
(iii) To add a new column `'Discount'` with value of `200` for all doctors.
(iv) To display rows with index `2` and `3`.
(v) To delete the column `'Department'`.

37. (a) Write SQL query for the following: **5**
(i) To display sum total of all the values of the `Score` column, from `STUDENTS` table.
(ii) To display the first five characters of the `Name` column from `STUDENTS` table.
(iii) To display the values of `Name` column from the `STUDENTS` table, after removing the trailing spaces.
(iv) To retrieve the lowest score from the `Score` column of `GRADES` table.
(v) To increase the fee of all students by `100`, in the `STUDENTS` table. (The name of the column is `FEE`)

OR

(b) Write SQL queries for the following:
(i) To calculate the square of `15`.
(ii) To round the number `456,789` to the nearest integer.
(iii) To display the position of first occurrence of `'com'` in the string `'mycommercial.com'`.
(iv) To display the name of the day for the date `'2024-11-07'`.
(v) To display the current date and time.

■■

Answers

SECTION - A

1. False

   Explanation: In Python Pandas, we can able to create an empty `DataFrame`. Syntax for creating empty DataFrame is: `DataFrame _ name = pd. DataFrame ().`

2. Option (D) is correct.

   Explanation: The `MONTHNAME()` function returns the full name of the month for the given date.

3. Option (C) is correct.

   Explanation: Cookies are small text files stored by websites on a user's device to remember preferences, login details and personalise the browsing experience.

4. Option (C) is correct.

   Explanation: `LEFT ()` function extracts a specified number of characters from the left side of a string. It is a type of string function not an aggregate function.

5. Option (A) is correct.

   Explanation: Copyright is a type of Intellectual Property which protects original works, including software, from being copied, distributed, or used without permission.

6. Option (C) is correct.

   Explanation: In Pandas, if an index is not explicitly specified, the default index type for a Series is a numeric (integer) index, starting from 0.

7. Option (D) is correct.

   Explanation: In `Matplotlib`, the `savefig()` function is used to save a plot as an image file (PNG, JPG, etc.).

8. False

   Explanation: The `MOD ()` function returns the remainder after dividing one number by another.

9. Option (C) is correct,

   Explanation: In Pandas, a Series is a one-dimensional, labelled data structure that can hold any data type (integers, floats, strings, etc.).

10. Option (B) is correct.

    Explanation: Phishing is a type of cybercrime where attackers send fraudulent emails pretending to be from legitimate organisations (like banks) to trick individuals into providing sensitive information (such as login credentials, credit card details, or bank account information).

11. Option (B) is correct.

    Explanation: The POWER (a, b) function in SQL calculates a raised to the power of b (a ^ b).

12. Option (B) is correct.

    Explanation: VoIP (Voice Over Internet Protocol) is the technology used for real-time audio and video communication over the Internet, including video calls. It enables the transmission of voice and multimedia content over IP networks.

13. Option (C) is correct.

    Explanation: In Pandas, to select a specific element from a Series using its index, we use bracket notation: `series _ name [index _ name]`.

14. Option (B) is correct.

    Explanation: Excessive screen time and poor posture can cause several health problems, including:

    - **Eye strain (Computer Vision Syndrome):** Dry eyes, headaches and blurred vision.
    - **Neck & Back Pain:** Due to poor posture while using screens.
    - **Sleep Disruptions:** Blue light exposure affects melatonin production.
    - **Increased Risk of Obesity:** Due to prolonged inactivity.

15. Option (B) is correct.

    Explanation: NumPy (Numerical Python) is the library in Python that defines and provides support for N-dimensional arrays (ndarrays), which are essential for numerical computations and data analysis.

16. Option (B) is correct.

    Explanation: **`ROUND ():`** It is a math function which can be used to round a number to a specified number of decimal places. For example: SELECT ROUND (12.5678,2) returns 12.57.

    `COUNT ():` It is an aggregate function which can be used to count the number of rows in a result set. For example: Syntax: COUNT (Col_name);

    `YEAR ():` It is a date function which can be used to extract the year from a date. For example: SELECT YEAR ('2025-01-02') return 2025.

    `RIGHT ():` It is a string or text function which can be used to extract a specified number of characters from the right side of a string. For example: SELECT RIGHT ('INFORMATION', 3) return ION.

17. Option (A) is correct.

    Explanation: In Pandas, the `rename()` function is used to change column labels in a DataFrame.

    Syntax: `df = df.rename({old _ name: new _ name}, axis='columns')`

- Pass a dictionary `{old_name: new_name}` to rename specific columns.
- Set axis=`'columns'` `(or axis=1)` to specify that we are renaming columns.

18. Option (D) is correct.

Explanation: In Pandas, `DataFrame.loc[]` is used for label-based indexing, meaning we can select rows and columns using their labels. Syntax: `DataFrame.loc[row_label, column_label]`.

19. Option (C) is correct.

Explanation: Every webpage on the Internet has a unique address called a Uniform Resource Locator (URL). A URL helps users access a specific webpage by specifying its location on the web.

20. Option (A) is correct.

Explanation: In Pandas, the .drop() method is used to delete rows and columns from a DataFrame. The axis parameter determines whether rows or columns are dropped:

- axis=0 → Drops rows
- axis=1 → Drops columns

Hence, assertion and reason are true and reason correctly explains the assertion.

21. Option (C) is correct.

Explanation: The ROUND () function in SQL is used to round off a number to a specified number of decimal places. It is a mathematical function which can takes the numeric as an input and return the numeric as an output. For example: ROUND (123.567,2) returns the output as 123.57. Hence, the assertion is true but the reason is false.

SECTION - B

22. (a)

S.N.	Series	DataFrame
1.	A one-dimensional labelled array that holds data of a single type (like a column in Excel).	A two-dimensional labelled data structure with rows and columns (like a table in SQL or Excel).
2.	Contains only one column with an index.	Contains multiple columns with rows and an index.
3.	Stores homogeneous data (all elements must be of the same type).	Can store heterogeneous data (different data types in different columns).
4.	Uses a single index to access elements.	Uses row and column indices to access elements.

(Any two points can be written).

OR

(b) Slicing in a Pandas Series allows us to access a subset of elements by specifying a range of indices. It works similarly to slicing in Python lists or NumPy arrays.

Syntax: Series [start: stop: step]

- start → The starting index (inclusive)
- stop → The stopping index (exclusive)
- step → The step size (optional, default is 1)

Example:

```
import pandas as pd
# Creating a Series
ser = pd.Series([10, 20, 30, 40, 50], index=["A", "B", "C", "D", "E"])
# Accessing elements using slicing
print ("Slice from index B to D:\n", ser["B":"D"])  # Label-based slicing
print ("\nSlice using positional indices:\n", ser[1:4])  # Positional slicing
print ("\nEvery second element:\n", ser[::2])  # Step slicing
```

Output:

Slice from index B to D:

B 20
C 30
D 40
dtype: int64

Slice using positional indices:

B 20
C 30
D 40
dtype: int64

Every second element:

A 10
C 30
E 50
dtype: int64

23. (i) Key Benefits of using Open-Source software:

- Cost-Effective
- Customizable
- Community-Driven
- Secure
- Fast-Development

(Any one can be written)

(ii) Examples of Open Source software are:

- Linux
- Apache
- MySQL
- LibreOffice

(Any two can be written)

24. **(i)**
```
SELECT UPPER ("Informatics Practices");
```
(ii)
```
SELECT LENGTH ("Informatics Practices");
```

25. **(a)**

S.N.	Static Web Page	Dynamic Web Page
1.	A web page with fixed content that does not change unless manually updated.	A web page where content is generated dynamically based on user interaction or database data.
2.	Built using HTML, CSS and JavaScript only.	Uses server-side scripting like PHP, Python, JavaScript (Node.js), or ASP.NET along with databases (MySQL, MongoDB, etc.).
3.	Content remains the same for all users.	Content changes based on user input, login, or real-time data.
4.	Limited interactivity; mostly displays text, images and links.	Highly interactive; allows users to submit forms, log in and retrieve real-time data.
	Simple company websites, portfolios, blogs, and landing pages.	Social media sites, e-commerce platforms, and dashboards (Facebook, Amazon, Google, etc.).

(Any two can be written)

OR

(b) A router is a networking device that directs data traffic between different networks, ensuring efficient communication between devices. It connects local networks (LANs) to the internet or other networks.

26. A Database Management System (DBMS) is software that allows users to store, manage, retrieve and manipulate data in an organised manner. It provides an interface between the database and the end-users or applications to ensure efficient data handling.

Examples of DBMS:

```
MySQL
Oracle
Microsoft SQL Server
SQLite
MongoDB
PostgreSQL
```
(Any two can be written)

27. Carelessly dumping or throwing electronic waste (e-waste) in landfills or dumping grounds leads to severe environmental hazards. Some of the key impacts include:

- Soil Pollution
- Water Pollution
- Air Pollution
- Health Hazards
- Harm to Wildlife

(Any two can be written)

28. (a)
```
import pandas as pd
data = [50,15,40]
series = pd.Series (data, index = ['x', 'y', 'z'])
print (series)
```

OR

(b)
```
import pandas as pd
data=[{'COLOUR':'Red', 'NAME':'Apple', 'QTY':10},
{'COLOUR' : 'Blue', 'NAME' : 'Berry', 'QTY':15},
{'COLOUR': 'Green', 'NAME': 'Guava', 'QTY':20}]
df = pd. DataFrame (data, index = [0,1,2])
print (df)
```

SECTION - C

29. (i) A digital footprint refers to the trail of data left behind when a person uses the internet. It includes:

Active footprint → Created when a user posts, comments, or shares information online.

Passive footprint → Collected without the user's knowledge, like browsing history and cookies.

Ways of Creation of Digital Footprint:

- Visiting websites
- Using social media (likes, shares, comments)
- Online shopping and searches
- Accepting cookies on websites.

(ii)
- Think Before you Post
- Respect other's privacy

(iii) If Ravi faces cyberbullying, he should block the bully and report it to the platform or school authorities.

30. (a)
```
import pandas as pd
city _ series = pd.Series(["Mumbai", "Dehradun", "Bengaluru", "Hyderabad"])
state _ series = pd.Series(["Maharashtra", "Uttarakhand", "Karnataka", "Telangana"])
data = {"City": city _ series, "State": state _ series}
df = pd.DataFrame(data)
print(df)
```

OR

(b)
```
import pandas as pd
import numpy as np
data = np.array([10, 20, 30, 40, 50])
indices = ['A', 'B', 'C', 'D', 'E']
series = pd.Series(data,
index=indices)
print(series)
```

31. (i)
```
CREATE TABLE CUSTOMER
(
CID INT PRIMARY KEY,
FNAME VARCHAR (20),
LNAME VARCHAR (20),
AGE INT
);
```

(ii)
```
SELECT * FROM CUSTOMER ORDER BY LNAME
DESC;
```

32. (a)

(i)
```
SELECT CITY, COUNT(*)
FROM STUDENTS
GROUP BY CITY;
```

(ii)
```
SELECT AVG(AGE)
FROM STUDENTS;
```

(iii)
```
SELECT S.NAME, G.GRADE
FROM STUDENTS S
JOIN GRADES G ON S.S _ ID = G.S _ ID;
```

OR

(b)

(i)
```
DELETE FROM SALES WHERE UNITSSOLD < 80;
```

(ii)
```
SELECT PNAME FROM PRODUCTS WHERE
CATEGORY IS NULL;
```

(iii)
```
SELECT P. PNAME, S.UNITSSOLD
FROM PRODUCTS P
JOIN SALES S ON P.PID = S.PID;
```

SECTION - D

33. (i) matplotlib.pyplot
(ii) plot
(iii) Days
(iv) Temperature Over 5 Days

34. (a)

(i)
```
INSERT INTO COURSE (C _ ID, C _ NAME,
INSTRUCTOR, DURATION) VALUES ('C106',
'INTRODUCTION TO AI', 'MS. PREETI', 55);
```

(ii)
```
SELECT MAX (DURATION) FROM COURSE;
```

(iii)
```
SELECT COUNT (*) FROM COURSE;
```

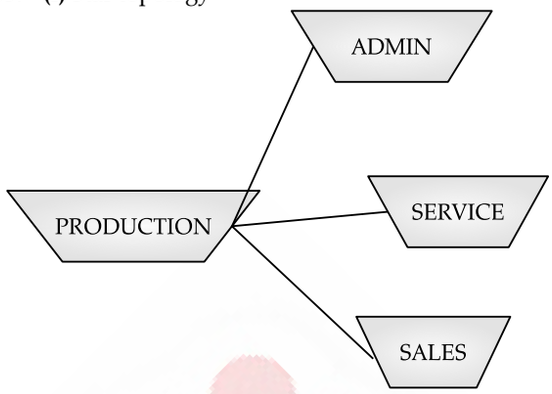
(iv)
```
SELECT LOWER (INSTRUCTOR) FROM COURSE;
```

OR

(b) 1
(i) PRIYA
(ii) RAVI SHARMA
(iii) ARJUN SINGH
PRIYA JAIN
(iv) 4

SECTION - E

35. (i) Star topology



(ii) WAN (Wide Area Network): The distance between Hyderabad and the USA necessitates a WAN, which can span across countries and continents.

(iii) Production division is the best placement for the server. Since it can have maximum number of computers.

(iv) To be placed in each block as each block has many computers that need to be connected to the network.

(v) To be placed between Sales to Production and Sales to Service, because a repeater is needed when the cable distance exceeds 100m to prevent signal degradation.

Distances to consider:

- Sales to Production = 110 m (Needs a repeater)
- Sales to Service = 135 m (Needs a repeater)

36. (i)
```
Doctor.tail(3)
```

(ii)
```
Doctor['Name']
```

(iii)
```
Doctor['Discount'] = 200
```

(iv)
```
Doctor.loc[[2, 3]]
```

(v)
```
Doctor = Doctor.
drop(columns=['Department'])
```

37. (a) (i)
```
SELECT SUM (SCORE) FROM STUDENTS;
```

(ii)
```
SELECT SUBSTR (NAME,1,5) FROM STUDENTS;
```

(iii)
```
SELECT RTRIM (NAME) FROM STUDENTS;
```

(iv)
```
SELECT MIN (SCORE) FROM GRADES;
```

(v)
```
UPDATE STUDENTS SET FEE = FEE + 100;
```

OR

(b) (i)
```
SELECT POWER (15,2);
```

(ii)
```
SELECT ROUND (456.789);
```

(iii)
```
SELECT  INSTR('mycommercial.com', 'com');
```

(iv)
```
SELECT DAYNAME ('2024-11-07');
```

(v)
```
SELECT NOW();
```

■■