

# CBSE EXAM PAPER 2024

## INFORMATICS PRACTICES

### Class-XII<sup>th</sup>

### (Solved)

Time : 3 Hours

Max. Marks : 70

#### 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. In ..... topology, the devices are arranged in the form of multiple branches in hierarchical manner. 1  
(A) Star (B) Tree (C) Mesh (D) Bus
2. Ridhima purchased a license for a copy of a software and made additional copies without the permission of the copyright owner. This act of hers is known as ..... 1  
(A) Trademark Infringement  
(B) Identity Theft  
(C) Copyright Infringement  
(D) Patent
3. What can an individual do to enhance the privacy of data stored digitally? 1  
(A) Share sensitive information on social media platforms.  
(B) Use your date of birth as your password.  
(C) Regularly update software installed on your device.  
(D) Download and install software from unknown sources.
4. What will be the output of the following query? 1  
`SELECT POWER (2, MOD (17, 3)) ;`  
(A) 8 (B) 1 (C) 0 (D) 4
5. Which of the following is not an aggregate function in MYSQL? 1  
(A) AVG () (B) MAX () (C) LCASE() (D) MIN ()
6. .... is the gaining of unauthorized access to data in a computer system. 1  
(A) Phishing (B) Plagiarism  
(C) Hacking (D) Copyright violation
7. Which of the following is NOT true with respect to CSV files? 1  
(A) Values are separated by commas.  
(B) to cvs() can be used to save a dataframe to a CSV file.  
(C) CSV file is created using a word processor.  
(D) CSV file is a type of text file.
8. Which MySQL command helps to add a primary key constraint to any table that has already been created? 1  
(A) UPDATE (B) INSERT INTO  
(C) ALTER TABLE (D) ORDER BY
9. What will be the output of the following query? 1  
`SELECT SUBSTR ("G20 2023 INDIA", 5, 4);`  
(A) G20 2 (B) 2023 (C) INDI (D) 023
10. What will be the output of the following Python code? 1  

```
import pandas as pd
dd={'One':1, 'Two':2, 'Three':3, 'Seven':7}
rr=pd.Series(dd)
rr['Four']=4
print(rr)
```

(A) One	1	(B) One	1
Two	2	Two	2
Three	3	Three	3
Seven	7	Four	4
		Seven	7
		dtype: int64	

(C) Four	4	(D) One	1
One	1	Two	2
Two	2	Three	3
Three	3	Seven	7
Seven	7	Four	4
		dtype: in64	
11. Which of the following clause cannot work with SELECT statement in MYSQL? 1  
(A) FROM (B) INSERT INTO  
(C) WHERE (D) GROUP BY
12. Which of the following command will not show first five rows from the Pandas series named S1? 1  
(A) S1 [0 : 5] (B) S1.head ()  
(C) S1.head (5) (D) S1.head [0 : 5]
13. Rama was unable to understand how the recruiters were able to know about her digital activity when she has not shared anything with them. 1

- The recruiters might have checked ..... of Rama.  
 (A) Carbon Footprint (B) Water Footprint  
 (C) Online print (D) Digital Footprint
14. Which MySQL string function is used to extract a substring from a given string based on a specified starting position and length? **1**  
 (A) SUBSTRING\_INDEX()  
 (B) LENGTH()  
 (C) MID() (D) TRIM()
15. The software that is free for anyone, and its source code is available for access, modification correction, and improvement is called ..... **1**  
 (A) Proprietary software  
 (B) Commercial software  
 (C) Free and Open source software  
 (D) Copyrighted software
16. .... help in data protection through copyrights, patents and trademarks. **1**  
 (A) Data Privacy Right  
 (B) Right to Innovation  
 (C) Intellectual Property Rights (IPR)  
 (D) Right to Data Protection
17. **Assertion (A)** : Cyber Bullying can have serious, emotional and psychological effects on victims. **1**  
**Reason (R)** : Online Bullying is not a crime while offline bullying is a crime.  
 (A) Both (A) and (R) are true and (R) is the correct explanation for (A).  
 (B) Both (A) and (R) are true and (R) is not the correct explanation for (A).  
 (C) (A) is true and (R) is false.  
 (D) (A) is false but (R) is true.
18. **Assertion (A)** : A Series is a one dimensional array and a DataFrame is a two-dimensional array containing sequence of values of any data type. (int, float, list, string, etc.) **1**  
**Reason (R)** : Both Series and DataFrames have by default numeric indexes starting from zero.  
 (A) Both (A) and (R) are true and (R) is the correct explanation for (A).  
 (B) Both (A) and (R) are true and (R) is not the correct explanation for (A).  
 (C) (A) is true and (R) is false.  
 (D) (A) is false but (R) is true.

### SECTION – B

19. (a) Expand URL, Identify the protocol and domain in the following URL: **2**  
**https://epathshala.nic.in/topics.php?len=en**  
**OR**  
 (b) Write any one advantage and one disadvantage of Star topology.
20. The Python code written below has syntactical errors. Rewrite the correct code and underline the correction(s) made. **2**  
 import Pandas as pd  
 stud=['Name' : 'Ramya', 'Class' : 11, 'House' : 'Red']  
 s=p. Series (s)  
 print (s)
21. What will be the output of the following SQL queries: **2**  
 (A) SELECT RIGHT ("CHANDRAYAN3", 4);  
 (B) SELECT ROUND (76345.456, 2)
22. Find the output of the following Python code: **2**  
 import pandas as pd  
 com=pd.Series([45,12,15,200],index=['mouse','printer', 'webcam', 'keyboard'])  
 print (com[1 : 3])
23. What is the primary function of a gateway in a computer network? Explain briefly. **2**
24. Consider the following Python code: **2**  
 import pandas as pd  
 S1=pd. Series ([ 'Rubina', 'Jaya', 'Vaibhav'], index=[10, 16, 18])  
 S2=pd.Series (....., index=[10, 16 18])  
 S3=pd.Series ([56, 67, 86],.....)  
 xiaa={'Name' :....., 'Subject' : S2, 'Marks' : S3}  
 df=pd.DataFrame (.....)  
 print (df)  
 Complete the above Python code to display the following output:
- |    | Name    | Subject | Marks |
|----|---------|---------|-------|
| 10 | Rubina  | IP      | 56    |
| 16 | Jaya    | HSc     | 67    |
| 18 | Vaibhav | Ip      | 86    |
25. Write any two differences between UPDATE and ALTER TABLE commands of MySQL. **2**

### SECTION – C

26. (a) Consider the given table and write the following queries in MySQL: **3**

Table : Sports

Sid	SName	Fees	DateofPlay	CoachID
1	Karate	1200	2024-08-24	S1
2	Football	1800	2024-09-13	S2
3	Cricket	1500	2024-06-14	S3
4	Lawn Tennis	2500	2024-09-25	S4
5	Badminton	1800	2024-10-20	S5

- (i) To display Sid and name of those sports which are to be played in the month of September.  
 (ii) To display all Sports names in lower case.  
 (iii) To display last two characters of all sports names whose fees is less than 1500.

**OR**

- (b) Predict the output of the following queries based on the table Sports given above:
- (i) SELECT UCASE (TRIM (SName) ) FROM Sports WHERE Sid=5;  
 (ii) SELECT LEFT (SName, 3) FROM Sports WHERE DateofPlay>"2024-09-13";  
 (iii) SELECT SUBSTR (CoachId,1) FROM Sports WHERE SName="Cricket" or Fees>=2000;
27. Kabir, a data analyst, has stored the voter's name and age in a dictionary. Now, Kabir wants to create a list of dictionaries to store data of multiple voters. He also wants to create a DataFrame from the same list of dictionaries having appropriate row labels as shown below: **3**

	Voter_Name	Voter_Age
Ar1001	Arjun	35
Ba3002	Bala	23

Go4002	Govind	25
Dh4007	Dhruv	19
Na6005	Navya	18

Help Kabir in writing a Python program to complete the task.

28. Answer the following questions based on the table Salesman given below: 3

**Table : Salesman**

salesman_id	name	city	commission
5001	Neil Bhatt	Delhi	0.15
5002	Rohan Malik	Mumbai	0.13
5005	Ravi Mohan	Delhi	0.11
5006	Mehak Rai	Delhi	0.14
5007	Pual lal	Bangalore	0.13
5003	Raman Sen	Kolkata	0.12

- (i) How many tuples does the given table have?  
(ii) Suggest the primary key for the given table.  
(iii) Write the MySQL query to display all the records in descending order of commission.
29. (a) Police officials arrested four members of an interstate gang for allegedly duping many people from different states on the pretext of providing them with holiday packages after creating fake websites of Tours and Travels. The cyber criminals sent fraudulent emails containing links to fraudulent websites created by them. 3

The victim in his complaint told police that he was offered a holiday package to Dubai for a total of 10 times in the next 10 years and was charged ₹ 1.45 lakh through his credit card.

Answer the following questions pertaining to the given news byte:

- (i) Identify the type of cybercrime mentioned in above case.  
(ii) Which Act deals with such crimes in India?

- (iii) Suggest any one precaution that can be taken to avoid falling prey to such criminals.

**OR**

- (b) ABC Electronics, a popular electronics retail chain, has been a prominent player in the market for years. However, recent concerns over environmental degradation and e-waste have prompted the company to rethink its strategies and practices. As the newly appointed sustainability manager, you've been asked to answer the following questions:

- (i) Considering the environmental concerns associated with e-waste, outline any one negative impact of the electronic products on the environment.  
(ii) Gopal is a college student who recently bought his new smartphone from ABC electronics. He's excited about the new features and improved performance of his new device. However, he's now left with his old smartphone, which is still functional but considered outdated. Suggest him any one action that he can take for his old smartphone.  
(iii) Provide any one recommendation on how ABC Electronics can responsibly manage its e-waste while minimizing harm to the environment.

30. Consider the given DataFrame 'password': 3

	CodeName	Category	Frequency
0	aaaaaa	alpha	6.91
1	dragon	animal	18.52
2	baseball	sport	1.29
3	football	sport	11.11
4	monkey	animal	3.72
5	qwerty	alpha	1.85
6	abcde	alpha	3.19

Write suitable Python statements for the following:

- (i) To add a new row with following values:  
CodeName – 'abc123'  
Category – alphanumeric  
Frequency – 12.8  
(ii) To delete the row with the row label 2.  
(iii) To delete the column having column label as Frequency.

## SECTION – D

31. Rupam creaed a MySQL table to store the details of Nobel prize winners. Help her to write the following MySQL queries: 4

**TABLE : NOBEL**

Winner_Id	YEAR	SUBJECT	WINNER	COUNTRY	CATEFORY
1001	1970	Physics	Hannes Alfvén	Sweden	Scientist
1002	1970	Physiology	Bernard Katz	NULL	Scientist
1003	1970	Literature	Aleksandr Solzhenitsyn	Russia	Linguist
1004	1971	Chemistry	Gerhard Herzberg	Germany	Scientist
1005	1978	Peace	Menachem Begin	Israel	Prime Minister
1006	1987	Economics	Robert Solow	USA	Economist
1007	1994	Literature	Kenzaburo Oe	Japan	Linguist

- (i) Display the names of Nobel Prize winner in 'Literature' for the year 1970.
- (ii) Display the subject and category of winners whose country is not known.
- (iii) Display the details of all Nobel Prize winners who were Scientists.
- (iv) Count total number of winners whose subject is Literature.
32. Ms. Ritika conducted an online assessment and stored the details in a DataFrame **result** as given below:

	Name	Score	Attempts	Qualify
a	Atulya	12.5	1	yes
b	Disha	9.0	3	no

c **Kavita** 16.5 2 yes

d **John** 15.0 1 no

Answer the following questions:

- (i) Predict the output of the following Python statement:  

```
print(result.loc[:, 'Attempts'] > 1)
```
- (ii) Write python statement to display the last three records.
- (iii) Write python statement to display records of 'a' and 'd' row labels.

OR

(Option for Part (iii) only)

- (iii) Write suitable Python statement to retrieve the data stored in the file, 'registration.csv' into a DataFrame, 'regis'.

## SECTION – E

33. Excellent Consultancy Pvt.Ltd. maintains two tables for all its employees.

5

Table : Employee

Employee_id	First_name	Last_name	Salary	Joining_dare	Department
E101	Monika	Das	100000	2019-01-20	Finance
E102	Mehak	Verma	600000	2019-01-15	IT
E103	Manan	Pant	890000	2019-02-05	Banking
E104	Shivam	Agarwal	200000	2019-02-25	Insurance
E105	Alisha	Singh	220000	2019-02-28	Finance
E106	Poonam	Sharma	400000	2019-05-10	IT
E107	Anshuman	Mishra	123000	2019-06-20	Banking

Table : Reward

Employee_id	Date_reward	Amount
E101	2019-05-11	1000
E102	2019-02-15	5000
E103	2019-04-22	2000
E106	2019-06-20	8000

Write suitable SQL queries to perform the following task:

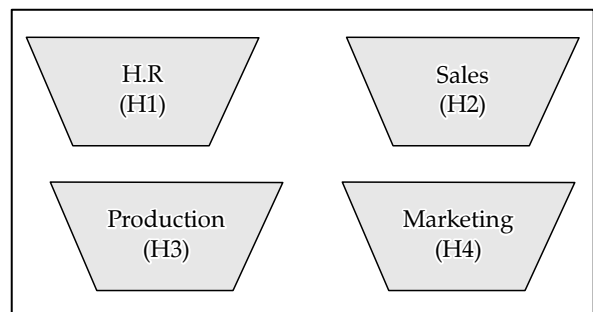
- (i) Change the Department of **Shivam** to IT in the table **Employee**.
- (ii) Remove the record of **Alisha** from the table **Employee**
- (iii) Add a new column **Experience** of integer type in the table **Employee**.
- (iv) Display the first name, last name and amount of reward for all employees from the tables **Employee** and **Reward**.
- (v) Display first name and salary of all the employees whose amount is less than 2000 from the tables **Employee** and **Reward**.

OR

Write suitable SQL queries for the following task:

- (i) Display the year of joining of all the employees from the table **Employee**.
- (ii) Display each department name and its corresponding average salary.
- (iii) Display the first name and date of reward of those employees who joined on Monday from the tables **Employee** and **Reward**.
- (iv) Display sum of salary of those employees whose reward amount is greater than 3000 from the tables **Employee** and **Reward**.
- (v) Remove the table **Reward**.

34. FULLMAN Tech, Bengaluru is a company that deals with software development. They have different divisions HR (H1), Sales (H2), Production (H3) and Marketing (H4). The layout of the Bengaluru 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:

<b>H1 to H2</b>	<b>76 m</b>
<b>H1 to H3</b>	<b>185 m</b>
<b>H1 to H4</b>	<b>88 m</b>
<b>H2 to H3</b>	<b>140 m</b>

H2 to H4	125 m
H3 to H4	160 m

Number of computers in each of the division:

Division	Number of Computers
H1	140
H2	340
H3	180
H4	260

Based on the above specifications, answer the following questions:

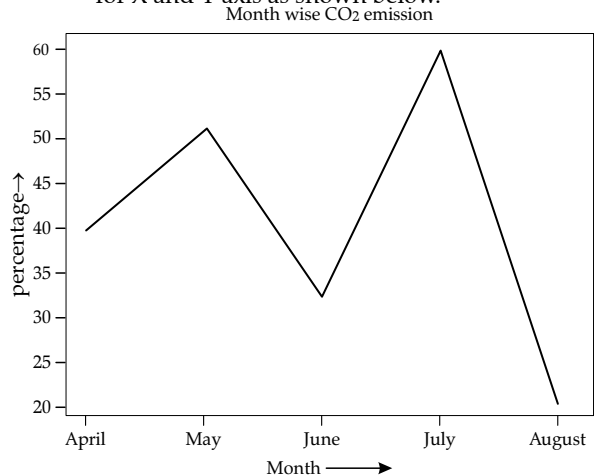
- (i) Suggest the topology and draw the most efficient cable layout for connecting all the divisions of Bengaluru branch.
- (ii) FULLMAN Tech is expanding its reach and therefore it establishes a new office in Delhi. Out of LAN, MAN, and WAN what kind of network will be created to connect Bengaluru office with Delhi Office?
- (iii) Suggest the division for the placement of server in Bengaluru branch. Explain the reason for your selection.
- (iv) Suggest the placement of the following devices in Bengaluru branch:  
(A) Repeater                      (B) Switch/Hub
- (v) The company's manager Ms. Ritu is worried as to how she can extend and modify the functionality of the web browser. Help her by giving names of any two tools.

35. (a) The inventory management software of a grocery shop stores the price of all fruits as follows: 5  
 Fruits=['Apple', 'Guava', 'Papaya', 'Grapes', 'Mango']  
 Price=[150, 40, 50, 30, 120]

Write suitable Python code to generate a Bar Chart on the given data. Also add the chart title and label for X and Y axis. Also add suitable statement to save this chart with the name **fruits . png**.

OR

- (b) Write suitable Python code to draw the following line chart "CO<sub>2</sub> Emission" having title and label for X and Y axis as shown below.



Also give suitable Python statement to save this chart with the name, **emission.png**.

## ANSWERS

### SECTION – A

1. **Option (B) is correct.**

**Explanation:** In a tree topology nodes are arranged in a hierarchical structure resembling a tree, with a central root node at the top and multiple levels of branches extending downward.

Each branch originates from a parent node and may have multiple child nodes branching off from it.

2. **Option (C) is correct.**

**Explanation:** Copyright infringement refers to the unauthorized use, reproduction, distribution, or adaptation of copyrighted material without the permission of the copyright holder. This can include various forms of creative works such as text, images, videos, music, software, and more.

3. **Option (C) is correct.**

**Explanation:** Maintaining up-to-date software is an essential part of a comprehensive data privacy and security strategy. It helps mitigate risks, protect sensitive information, and ensure compliance with relevant privacy regulations.

4. **Option (D) is correct.**

**Explanation:** According to BODMAS rule, the inner function has to be executed first MOD(17, 3):

$$\text{MOD}(17, 3) = 17 \% 3 = 2$$

Next, we'll use this result in the POWER function:

$$\text{POWER}(2, 2) = 2^2 = 4$$

5. **Option (C) is correct.**

**Explanation:** These aggregate functions can be combined with other clauses such as WHERE, GROUP BY, HAVING, and ORDER BY to perform more complex calculations and analyses on the data in MySQL databases. Some of the aggregate functions are: COUNT(), SUM(), AVG(), MIN(), MAX(), GROUP(), CONCAT().

6. **Option (C) is correct.**

**Explanation:** In the context of data security, hacking refers to the unauthorized access, manipulation, or exploitation of computer systems, networks, or data. It involves using various techniques and tools to breach security measures and gain unauthorized access to sensitive information or resources.

7. **Option (C) is correct.**

**Explanation:** CSV stands for Comma-Separated Values. It is a simple file format used to store tabular data, such as a spreadsheet or database.

8. **Option (C) is correct.**

**Explanation:** To add a primary key in SQL, you can use the ALTER TABLE statement along with the ADD CONSTRAINT clause. Here's the syntax:

```
ALTER TABLE table_name
```

```
ADD CONSTRAINT constraint_name PRIMARY KEY (column_name);
```

**Note:** Before adding a primary key, ensure that the column(s) you're designating as the primary key do not contain duplicate or NULL values, as primary keys must be unique and not null.

**9. Option (B) is correct.**

**Explanation:** the result of the query would be '2023', which is the substring extracted from the input string. It starts from the 5th character ('2') and extracts 4 characters ('2023').

**10. Option (D) is correct.**

**Explanation:**

- The `pd.Series()` function is used to convert the dictionary `dd` into a pandas Series object `rr`.
- The `rr['Four']=4` statement adds a new key 'Four' with value 4 to the Series `rr`.
- The keys of the dictionary become the index labels of the Series.
- The values of the dictionary become the values of the Series.
- The newly added key-value pair 'Four': 4 is displayed at the end of the Series.

**11. Option (B) is correct.**

**Explanation:** The INSERT INTO command is used to insert new records into a table. It is not directly used with the SELECT command, as it is used for adding new data rather than querying existing data.

**12. Option (D) is correct.**

**Explanation:** `S1.head[0:5]`: This syntax is incorrect. The correct way to use the `head()` function is with parentheses, not square brackets. So, this command will result in a syntax error.

`S1.head()`: This command will display the default number of rows from the beginning of the Series. By default, `head()` function displays the first 5 rows. So, this will also show the first 5 rows, but explicitly specifying (5) is more clear and recommended.

**13. Option (D) is correct.**

**Explanation:** A digital footprint encompasses all the traces of an individual's online presence, including:

- Websites visited
- Social media posts and interactions
- Online purchases and transactions
- Emails sent and received
- Search engine queries
- Digital files uploaded or downloaded
- Location data from mobile devices
- Cookies and browsing history

**14. Option (C) is correct.**

**Explanation:** the syntax of the `MID()` function: `MID(string, start_position, length)`

**15. Option (C) is correct.**

**Explanation:** Free and open-source software (FOSS) refers to software that is both freely available for anyone to use and distribute, and its underlying source code is openly accessible, allowing users to view, modify, and redistribute it as they see fit. Examples of FOSS include the Linux operating system, Mozilla Firefox web browser, LibreOffice productivity suite, and Apache HTTP Server.

**16. Option (C) is correct.**

**Explanation:** Intellectual Property Rights (IPR) refer to the legal rights granted to individuals or entities over creations of the mind. The main types of intellectual property rights include: Patents, Copyrights, Trademarks, Trade Secrets, Industrial Designs, Plant Varieties.

**17. Option (C) is correct.**

**Explanation:** Cyberbullying is a form of harassment or bullying that occurs online or through digital communication channels such as social media, messaging apps, email, or online forums.

In many jurisdictions, both online and offline bullying can be considered criminal offenses, depending on the nature and severity of the behavior and the applicable laws.

**18. Option (B) is correct.**

**Explanation:** While the assertion correctly describes the nature of Series and DataFrame objects, the reason is inaccurate regarding the default index behavior of DataFrames.

**SECTION – B****19. (a) URL: Uniform Resource Locator**

**Scheme or Protocol:** `https:`

**Domain Name:** `epathshala`.

**Top level domain:** `nic.in` (`.in` indicates that it is a domain associated with India, and `nic` likely stands for National Informatics Centre, which is responsible for managing government websites in India.)

**Path:** `topics.php`

**Query string separator:?**

**Query string/parameter:** `len=en`

**OR**

**(b) Advantage:**

**Centralized Management:** All devices are connected to a central hub or switch. This centralized structure makes it easy to manage and troubleshoot the network. Administrators can easily monitor network activity, identify issues, and make changes from a single location.

**Disadvantage:**

**Single Point of Failure:** The central hub or switch in a star topology serves as a single point of failure. If the central device fails, it can disrupt communication between all devices connected to the network.

**20. `import Pandas as pd#` Syntactical error: 'Pandas' should be 'pandas'**

`stud=['Name': 'Ramya', 'Class': 11, 'House': 'Red'] #`  
**Syntactical error: Should use curly braces {} instead of square brackets []**

`s=p.Series(s)#` **Syntactical error: 'p.Series(s)' should be 'pd.Series(stud)'**

`print(s)`

**Correct Code**

`import pandas as pd`

`stud={'Name': 'Ramya', 'Class': 11, 'House': 'Red'}`

`s = pd.Series(stud)`

`print(s)`

**21. The output of the provided SQL queries would be:**

**(i) `SELECT RIGHT("CHANDRAYAN3", 4);`**

**Output:** "YAN3"

**Explanation:** The `RIGHT()` function returns the rightmost characters of a string. In this case, it returns the rightmost 4 characters of the string "CHANDRAYAN3", which are "YAN3".

**(ii) `SELECT ROUND(76345.456, 2);`**

**Output:** 76345.46

**Explanation:** The `ROUND()` function is used to round a number to a specified number of decimal places. In this case, the number 76345.456 is rounded to 2 decimal places, resulting in 76345.46.

**22. The output of the provided Python code would be:**

```
printer 12
webcam 15
dtype: int64
```

**Explanation:** The statement `print(com[1:3])` slices the Series from index position 1 (inclusive) to index position 3 (exclusive), so it selects elements with index labels 'printer' and 'webcam'.

The output displays these selected elements with their corresponding values.

23. The primary function of a gateway in a computer network is to serve as an entry and exit point between two different networks, facilitating communication and data exchange between them.

Gateways connect networks that use different communication protocols, architectures, or technologies. They enable seamless communication between these networks by translating data formats, protocols, or addressing schemes as necessary.

24. Here's the completed Python code to display the desired output:

```
import pandas as pd
# Create Series objects
s1 = pd.Series(['Rubina', 'Jaya', 'Vaibhav'], index=[10, 16, 18])
s2 = pd.Series(['IP', 'HSc', 'IP'], index=[10, 16, 18])
s3 = pd.Series([56, 67, 86], index=[10, 16, 18])
# Create a dictionary to hold data for DataFrame
xiia = {'Name': s1, 'Subject': s2, 'Marks': s3}
# Create DataFrame using the dictionary
df = pd.DataFrame(xiia)
print(df)
```

**Explanation:** Three Series objects s1, s2, and s3 are created to hold the names, subjects, and marks respectively.

A dictionary data is created with keys as column names and values as the respective Series objects.

Finally, a DataFrame df is created using the dictionary data. When printed, it displays the desired output.

25. The main differences between the UPDATE and ALTER TABLE commands in MySQL are as follows:

UPDATE	ALTER TABLE
The UPDATE command is used to modify existing records or rows in a table. It changes the values of one or more columns in existing rows.	The ALTER TABLE command is used to modify the structure of a table. It allows you to add, modify, or drop columns, constraints, indexes, and other table attributes.
The UPDATE command operates at the row level within a table.	The ALTER TABLE command operates at the table level.
WHERE clause can be used with UPDATE command.	WHERE clause cannot be used with ALTER command.

### SECTION – C

26. (a) (i) `SELECT Sid, SName FROM Sports WHERE MONTH(DateofPlay)=9;`  
(ii) `SELECT LCASE(SName) FROM Sports;`  
(iii) `SELECT RIGHT(SName, 2) FROM Sports WHERE Fees < 1500;`

OR

- (b) (i) BADMINTON

**Explanation:** The provided SQL query selects the trimmed and uppercase version of the SName column from the Sports table for the record where the Sid column is equal to 5.

- (ii) Law

Bad

**Explanation:** The provided SQL query selects the first three characters from the SName column of the Sports table for records where the DateofPlay column is after September 13, 2024.

- (iii) S3

S4

**Explanation:** The provided SQL query selects the first character from the CoachId column of the Sports table for records where the SName column is equal to "Cricket" or the Fees column is greater than or equal to 2000.

27. `import pandas as pd`

# Data of multiple voters as a list of dictionaries

```
voters_data = [
{'Voter_Name': 'Arjun', 'Voter_Age': 35},
{'Voter_Name': 'Bala', 'Voter_Age': 23},
{'Voter_Name': 'Govind', 'Voter_Age': 25},
{'Voter_Name': 'Dhruv', 'Voter_Age': 19},
{'Voter_Name': 'Navya', 'Voter_Age': 18},
]
# Create a DataFrame from the list of dictionaries
df = pd.DataFrame(voters_data, index=['Ar1001', 'Ba3002', 'Go4002', 'Dh4007', 'Na6005'])
# Display the DataFrame
print(df)
```

28. (i) Tuple = 6

**Explanation:** Tuple refers to the number of records or rows present in the table.

- (ii) Primary Key- salesman\_id

**Explanation:** Primary Key must be unique and does not have null values. In this table, salesman\_id column only has unique values. Hence, it has been selected as the primary key.

- (iii) `SELECT * FROM Salesman ORDER BY commission DESC;`

29. (a) (i) Phishing

- (ii) IT Act 2000

(iii) To avoid phishing attacks, consider implementing the following precautions:

- Do not click on links or download attachments in unsolicited emails, messages, or pop-up windows.
- Avoid sharing sensitive information, such as passwords, account numbers, or Social Security numbers, in response to unsolicited requests.
- Check the URL of websites you visit to ensure they are legitimate.
- Ensure that your operating system, antivirus software, and web browsers are up to date with the latest security patches. [Write any one]

OR

- (b) (i) The improper disposal and management of electronic products contribute to environmental pollution, ecosystem degradation, and human health hazards, making e-waste a significant environmental concern.

(ii) One action that Gopal can take for his old smartphone is to donate it to a reputable organization or charity. Many organizations accept donations of used electronic devices, including smartphones, and refurbish them for reuse or recycle them responsibly. By donating his old smartphone, Gopal can help extend its lifespan and provide someone in need with access to a functional device.

Before donating his smartphone, Gopal should ensure that he removes all personal data or information stored on the device by performing a factory reset and wiping the data securely. This will help protect his privacy and ensure that the device is ready for its new owner.

(iii) One recommendation for ABC Electronics to responsibly manage its e-waste while minimizing harm to the environment is to implement an electronics recycling program.

30. (i) `new_row = {'CodeName': 'abc123', 'Category': 'alphanumeric', 'Frequency': 12.8}`  
`password.loc[len(password)] = ['abc123', 'alphanumeric', 12.8]`  
 (ii) `password = password.drop(2)`  
 (iii) `password = password.drop('Frequency', axis=1)`

#### SECTION – D

31. (i) `SELECT WINNER FROM NOBEL WHERE YEAR=1970 AND SUBJECT='Literature';`  
 (ii) `SELECT SUBJECT, CATEGORY FROM NOBEL WHERE COUNTRY IS NULL;`  
 (iii) `SELECT * FROM NOBEL WHERE CATEGORY='Scientist';`  
 (iv) `SELECT COUNT(*) FROM NOBEL WHERE SUBJECT='Literature';`
32. (i) the output will be:  
 0 False  
 1 True  
 2 True  
 3 False

#### Explanation:

For the first entry (index 0), the value is 1, which is not greater than 1, so the result is False.

For the second entry (index 1), the value is 3, which is greater than 1, so the result is True.

For the third entry (index 2), the value is 2, which is greater than 1, so the result is True.

For the fourth entry (index 3), the value is 1, which is not greater than 1, so the result is False.

(ii) You can use any one of the following statement:

```
result.tail(3)
result.loc['b:']
result.iloc[-3:]
result.loc[['b', 'c', 'd']]
result.loc['b': 'd']
```

(iii) We can use the `.loc[]` method with a list containing the desired row labels.

```
result.loc[['a', 'd']]
```

#### OR (Option for Part (iii) only)

Assuming 'registration.csv' is in the current directory  
`regis = pd.read_csv('registration.csv')`

This will read the data from the CSV file 'registration.csv' and store it in a DataFrame named 'regis'.

#### SECTION – E

33. (i) `UPDATE Employee SET Department='IT' WHERE First_name='Shivam';`  
 (ii) `DELETE FROM Employee WHERE First_name='Alisha';`  
 (iii) `ALTER TABLE Employee ADD Experience int;`  
 (iv) `SELECT First_name, Last_name, Amount FROM Employee E, Reward R WHERE E.Employee_id=R.Employee_id;`  
 (v) `SELECT First_name, Salary FROM Employee E, Reward R WHERE E.Employee_id=R.Employee_id AND Amount<2000;`

#### OR

- (i) `SELECT YEAR(Joining_date) FROM Employee;`

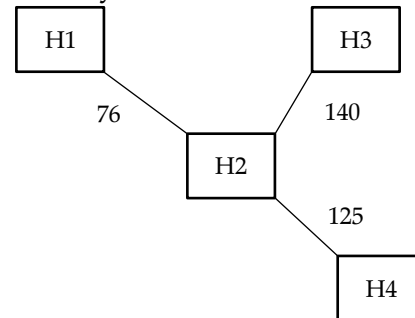
(ii) `SELECT Department, AVG(Salary) FROM Employee GROUP BY Department;`

(iii) `SELECT First_name, Date_reward FROM Employee E, Reward R WHERE E.Employee_id=R.Employee_id AND DAYNAME(Joining_date)='MONDAY';`

(iv) `SELECT SUM(Salary) FROM Employee E, Reward R WHERE E.Employee_id=R.Employee_id AND Amount>3000;`

(v) `DROP TABLE Reward;`

34. (i) **Cable Layout**



We will use Star topology.

(ii) WAN (Wide Area Network). It spans across the world wide. Hence, it will be used to connect the office in two different states.

(iii) H2 for placement of server because it has maximum number of computers.

(iv) (a) Repeater will be used between H2 and H3.

(b) Switch/Hub will be used in each and every division.

(v) Plugins and Add-ons

35. (a) `import matplotlib.pyplot as plt`

```
# Data
fruits = ['Apple', 'Guava', 'Papaya', 'Grapes', 'Mango']
price = [150, 70, 50, 30, 120]
# Create bar chart
plt.bar(fruits, price, color='orange')
# Add title and labels
plt.title('Prices of Fruits')
plt.xlabel('Fruits')
plt.ylabel('Price (in Rs)')
# Save the chart as fruits.png
plt.savefig('fruits.png')
# Show the chart
plt.show()
```

- (b) `import matplotlib.pyplot as plt`

```
# Data
list1 = ['April', 'May', 'June', 'July', 'August']
list2 = [40, 50, 30, 60, 20]
# Create line chart
plt.plot(list1, list2)
# Add title and labels
plt.title('Month Wise CO2 emission')
plt.xlabel('Month')
plt.ylabel('Percentage')
# Save the chart as fruits.png
plt.savefig('emission.png')
# Show the chart
plt.show()
```