

General Instructions

- (i) The test is of 1 hour duration.
- (ii) The question paper consists of 50 questions. The maximum marks are 250.
- (iii) 5 marks are awarded for every correct answer, and 1 mark is deducted for every wrong answer.

1. Which SQL command is used to remove all rows from a table without deleting the table structure?

- (A) DELETE
- (B) DROP
- (C) TRUNCATE
- (D) REMOVE

Correct Answer: (C) TRUNCATE

Solution:

Step 1: Understanding the Concept:

In SQL, there are different Data Manipulation Language (DML) and Data Definition Language (DDL) commands used to manage data and structures.

Step 2: Detailed Explanation:

- **DELETE:** This is a DML command used to remove rows. However, it is typically slower for removing all rows as it logs each deletion and can be used with a WHERE clause.
- **DROP:** This command deletes the entire table, including its data and its structure (the

schema).

- **TRUNCATE:** This is a DDL command that removes all rows from a table. It is faster than DELETE because it doesn't log individual row deletions, and it preserves the table structure for future use.

Step 3: Final Answer:

The command used to remove all rows while keeping the structure is TRUNCATE.

Quick Tip: Think of it this way: DELETE is like erasing lines in a notebook, TRUNCATE is like ripping out all the pages but keeping the cover, and DROP is like throwing the whole notebook in the trash!

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

```
a = [1, 2, 3]
print(a[::-1])
```

- (A) [1, 2, 3]
- (B) [3, 2, 1]
- (C) Error
- (D) None

Correct Answer: (B) [3, 2, 1]

Solution:

Step 1: Understanding the Concept:

This question tests your knowledge of "Slicing" in Python. Slicing allows you to access a specific range or order of elements in a sequence like a list or string.

Step 2: Detailed Explanation:

The syntax for slicing is [start:stop:step].

- In the code `a[::-1]`, the start and stop values are omitted, which means Python considers the whole list.
- The step value is `-1`. A negative step means the list is traversed backwards.

- Therefore, a `[::-1]` creates a new list starting from the last element and moving to the first.

Step 3: Final Answer:

The output will be the reversed list: `[3, 2, 1]`.

Quick Tip: The slice `[::-1]` is the "Pythonic" way to reverse a list or string. It's concise, fast, and very common in coding interviews!

3. Which protocol is used for sending e-mails?

- (A) HTTP
- (C) SMTP
- (B) FTP
- (D) TCP

Correct Answer: (C) SMTP

Solution:**Step 1: Understanding the Concept:**

Networking protocols are sets of rules that govern how data is exchanged across a network. Different tasks (web browsing, file transfer, email) use different protocols.

Step 2: Detailed Explanation:

- **HTTP (Hypertext Transfer Protocol):** Used for accessing websites.
- **FTP (File Transfer Protocol):** Used for transferring files between computers.
- **SMTP (Simple Mail Transfer Protocol):** This is the standard protocol specifically designed for sending emails from a client to a server or between servers.
- **TCP (Transmission Control Protocol):** A foundational protocol that ensures reliable delivery of data packets, but it isn't specific to email content.

Step 3: Final Answer:

The protocol used for sending emails is SMTP.

Quick Tip: To remember this, think of the "S" in SMTP as standing for "Sending" Mail. For receiving mail, we typically use POP3 or IMAP.

4. In Python, which data type is immutable?

- (A) List
- (B) Dictionary
- (C) Set
- (D) Tuple

Correct Answer: (D) Tuple

Solution:**Step 1: Understanding the Concept:**

In programming, "mutability" refers to whether an object's state or content can be changed after it is created. Immutable objects cannot be changed, while mutable objects can.

Step 2: Detailed Explanation:

- **Mutable (Can change):** Lists, Dictionaries, and Sets allow you to add, remove, or modify elements in place.
- **Immutable (Cannot change):** Tuples, Strings, and Integers do not allow modification. Once a tuple is created, you cannot change its elements or its size.

Step 3: Final Answer:

The Tuple is the immutable data type among the options.

Quick Tip: Think of a List as a pencil-written list (you can erase and change it) and a Tuple as one written in permanent ink. Use Tuples when you want to make sure your data stays constant throughout the program.

5. Which of the following is NOT a valid aggregate function in SQL?

- (A) AVG()
- (B) SUM()
- (C) COUNT()
- (D) COMPUTE()

Correct Answer: (D) COMPUTE()

Solution:

Step 1: Understanding the Concept:

Aggregate functions in SQL perform a calculation on a set of values and return a single value. They are often used with the GROUP BY clause.

Step 2: Detailed Explanation:

Standard SQL aggregate functions include:

- **AVG():** Calculates the average value.
- **SUM():** Adds up all the values.
- **COUNT():** Counts the number of rows.
- **MAX() / MIN():** Finds the highest and lowest values.

COMPUTE() is not a standard aggregate function in modern SQL. While some legacy systems had a COMPUTE clause for generating summary rows, it is not a standard function used in SELECT statements like the others.

Step 3: Final Answer:

COMPUTE() is not a valid aggregate function.

Quick Tip: Aggregate functions usually ignore NULL values, except for COUNT(), which counts every row regardless of content.

6. What is the full form of URL?

- (A) Uniform Resource Locator
- (B) Universal Resource Link
- (C) Uniform Reference Link
- (D) Unified Resource Locator

Correct Answer: (A) Uniform Resource Locator

Solution:

Step 1: Understanding the Concept:

A URL is the global address of documents and other resources on the World Wide Web.

Step 2: Detailed Explanation:

The acronym stands for **Uniform Resource Locator**.

- **Uniform:** It follows a standard format.
- **Resource:** It points to a file, page, or image.
- **Locator:** It provides the "location" or address of that resource on the internet.

Step 3: Final Answer:

The full form of URL is Uniform Resource Locator.

Quick Tip: A URL consists of several parts: the protocol (http://), the domain name (google.com), and the path (/search). Together, they tell your browser exactly where to find a specific resource.

7. Which keyword is used to define a function in Python?

- (A) function
- (B) define

- (C) def
(D) func

Correct Answer: (C) def

Solution:

Step 1: Understanding the Concept:

In programming, a function is a reusable block of code that performs a specific task. Every language has a specific "reserved word" or keyword to tell the interpreter that a function is being created.

Step 2: Detailed Explanation:

In Python, the keyword used is **def**, which is short for "define."

- The syntax follows the structure: `def function_name():`
- Unlike some other languages like JavaScript (which uses `function`) or C++ (which uses the return type), Python keeps it concise with three letters.

Step 3: Final Answer:

The keyword used to define a function in Python is `def`.

Quick Tip: Remember that Python is designed for readability and brevity. Most of its keywords are short (e.g., 'def', 'elif', 'pass').

8. Which topology uses a central hub/switch?

- (A) Ring Topology
(B) Bus Topology
(C) Mesh Topology
(D) Star Topology

Correct Answer: (D) Star Topology

Solution:

Step 1: Understanding the Concept:

Network topology refers to the physical or logical layout of a network—how various nodes (computers, printers) are connected to each other.

Step 2: Detailed Explanation:

- **Star Topology:** Every node is connected to a central device (a hub, switch, or router). All data passes through this central point before reaching its destination.
- **Bus Topology:** All nodes share a single main cable (the "bus").
- **Ring Topology:** Each node is connected to exactly two other nodes, forming a continuous circle.
- **Mesh Topology:** Every node is connected to every other node (or many others) for high redundancy.

Step 3: Final Answer:

The Star Topology uses a central hub or switch.

Quick Tip: Star topology is the most common layout in modern office and home networks because if one computer's cable breaks, the rest of the network keeps working!

9. What will be the output?

`x = 5`

`y = 2`

`print(x // y)`

(A) 2.5

(B) 2

(C) 3

(D) Error

Correct Answer: (B) 2

Solution:**Step 1: Understanding the Concept:**

Python provides different types of division operators: `/` for standard division and `//` for "Floor Division."

Step 2: Detailed Explanation:

1. Standard division ($5/2$) would result in 2.5. 2. Floor division ($5//2$) performs the division and then "rounds down" to the nearest whole integer. 3. Mathematically: $5 \div 2 = 2.5$. The "floor" of 2.5 is 2. Note: If the result is negative, it still rounds down (away from zero). For example, $-5//2$ would be -3 .

Step 3: Final Answer:

The output of `5 // 2` is 2.

Quick Tip: To remember the difference: `- '/'` gives you the decimal. `- '//'` gives you the integer (quotient).
- ‘

10. Which clause is used to filter records in SQL?

- (A) ORDER BY
- (B) GROUP BY
- (C) WHERE
- (D) HAVING

Correct Answer: (C) WHERE

Solution:**Step 1: Understanding the Concept:**

Filtering is the process of selecting specific rows from a table that meet a certain criteria, while hiding the rows that do not.

Step 2: Detailed Explanation:

- **ORDER BY:** Used to sort the result set in ascending or descending order.
- **GROUP BY:** Used to arrange identical data into groups, often used with aggregate functions.
- **WHERE:** This is the primary clause used to **filter records**. It acts on individual rows before any grouping occurs. For example: `SELECT FROM students WHERE age > 18;`
- **HAVING:** Also used for filtering, but it specifically filters **groups** created by the GROUP BY clause, not individual rows.

Step 3: Final Answer:

The WHERE clause is used to filter records.

Quick Tip: A common interview question is the difference between 'WHERE' and 'HAVING'. Just remember: WHERE filters the rows before they are grouped, and HAVING filters the results after they are grouped.