Rajasthan Board Class 12 Computer Science Question Paper with Solution(Memory Based)

General Instructions

1. The question paper consists of six sections — Section A to Section F.
2. Time allowed is **3 hours 15 minutes** and the maximum marks are **90**.
3. All questions are compulsory unless otherwise stated.
4. Section A contains Multiple Choice Questions (MCQs). Choose the correct answer from the given options.
5. Section B includes:
   - True/False questions
   - Fill in the blanks
   - Very short answer questions (one or two words)
6. Section C contains short answer type questions.
7. Section D contains long descriptive questions with internal choices.
8. Section E contains long answer questions. Attempt the required number as instructed.
9. Section F consists of Map Work. Mark and label the places correctly on the outline map of India.
10. Figures to the right indicate full marks for each question.
11. Write neatly and draw diagrams wherever necessary.
12. Write answers only in the space provided or as instructed.

---

1. Which of the following is an immutable data type in Python?
(A) List
(B) Dictionary
(C) Tuple
(D) Set

Correct Answer: (C) Tuple

Solution: Concept: In Python, data types are categorized as mutable or immutable based on whether their contents can be changed after creation.
Step 1: Understand immutable types. Immutable objects cannot be modified once they are created. Any change results in a new object.
Step 2: Check each option.

- **List** – Mutable (elements can be added or modified).
- **Dictionary** – Mutable (key-value pairs can be updated).

- **Tuple** – Immutable (cannot be changed after creation).
- **Set** – Mutable (elements can be added or removed).

Step 3: Identify correct option. Only tuples are immutable among the given choices.

Quick Tip

Common immutable Python types: tuple, string, int, float, frozenset. Lists, sets, and dictionaries are mutable.

---

2. Which function is used to get the current position of the file pointer?
(A) seek()
(B) tell()
(C) pos()
(D) where()

Correct Answer: (B) tell()

Solution: Concept: In Python file handling, the file pointer indicates the current position within an open file. Specific methods are used to move or retrieve this position.
Step 1: Understand relevant functions.

- **tell()** – Returns the current position of the file pointer.
- **seek()** – Moves the file pointer to a specified location.

Step 2: Check options.

- **seek()** – Used to change position, not retrieve it.
- **tell()** – Correct function to get current position.
- **pos()** – Not a valid Python file method.
- **where()** – Not a valid Python file method.

Step 3: Final answer. The function that returns the current file pointer position is **tell()**.

Quick Tip

tell() → returns current file pointer position seek(offset) → moves the file pointer

---

3. A stack follows which principle?
(A) FIFO
(B) LIFO
(C) FILO
(D) None

Correct Answer: (B) LIFO

Solution: Concept: A stack is a linear data structure that allows insertion and deletion of elements from only one end, called the top.
Step 1: Understand stack behavior. In a stack, the last element inserted is the first one to be removed.
Step 2: Principle name. This behavior is called **LIFO (Last In, First Out)**.
Step 3: Evaluate options.

- **FIFO** – Used in queues (First In, First Out).
- **LIFO** – Correct for stacks.
- **FILO** – Same meaning but not standard terminology.
- **None** – Incorrect.

Conclusion: A stack follows the LIFO principle.

Quick Tip

Stack → LIFO Queue → FIFO

---

4. Which command is used to remove a table's entire structure from a database?
(A) DELETE
(B) DROP
(C) TRUNCATE
(D) REMOVE

Correct Answer: (B) DROP

Solution: Concept: In SQL, different commands are used to remove data or database objects. Some remove only records, while others remove the entire structure.
Step 1: Understand SQL commands.

- **DELETE** – Removes rows from a table but keeps the structure.
- **TRUNCATE** – Removes all rows quickly but keeps the table structure.
- **DROP** – Removes the entire table, including its structure and data.

Step 2: Evaluate options.

- DELETE – Removes records only.
- DROP – Removes table structure and data (correct).
- TRUNCATE – Keeps structure intact.
- REMOVE – Not a valid SQL command.

Conclusion: The command used to remove a table's entire structure is **DROP**.

Quick Tip

DELETE → removes rows TRUNCATE → removes all rows, keeps structure DROP → deletes table completely

---

5. What is the full form of SMTP?

Correct Answer: Simple Mail Transfer Protocol

Solution: Concept: SMTP is a standard communication protocol used in computer networks for sending emails over the Internet.
Explanation:

- SMTP stands for **Simple Mail Transfer Protocol**.
- It is used to send emails from a client to a mail server or between mail servers.
- SMTP works along with other protocols like POP3 and IMAP (used for receiving emails).

Conclusion: SMTP is the protocol responsible for sending electronic mail across networks.

Quick Tip

SMTP → Sending emails POP3/IMAP → Receiving emails

---

6. Differentiate between actual parameters and formal parameters with a brief example.

Solution: Concept: In programming, parameters are used to pass values between functions. They are classified into actual parameters and formal parameters based on where they are used.
Actual Parameters:

- These are the values or variables passed during a function call.
- They exist in the calling function.
- Also called *arguments*.

Formal Parameters:

- These are the variables defined in the function definition.
- They receive values from actual parameters.
- They act as placeholders inside the function.

Key Differences:

Actual Parameters	Formal Parameters
Used in function call	Used in function definition
Contain real values	Receive values
Exist outside function	Exist inside function

Example (Python):

```
def add(a, b):   # a, b are formal parameters
    return a + b

result = add(5, 3)  # 5, 3 are actual parameters
```

Explanation: Here, `a` and `b` are formal parameters defined in the function, while `5` and `3` are actual parameters passed during the function call.
Conclusion: Actual parameters are the real values passed to a function, whereas formal parameters are the variables that receive those values inside the function.

Quick Tip

Actual = arguments passed during function call
Formal = variables defined in function definition

---

7. Write a command to create a table named Student with fields RollNo (int), Name (varchar), and Marks (float).

Solution: Concept: In SQL, the `CREATE TABLE` command is used to create a new table with specified fields and data types.
Syntax:

```
CREATE TABLE table_name (
    column1 datatype,
    column2 datatype,
    ...
);
```

Required SQL Command:

```
CREATE TABLE Student (
    RollNo INT,
    Name VARCHAR(50),
    Marks FLOAT
);
```

Explanation:

- `Student` → Table name
- `RollNo INT` → Integer field for roll number
- `Name VARCHAR(50)` → Variable-length text field

- `Marks FLOAT` → Decimal values for marks

Conclusion: The `CREATE TABLE` statement defines the structure of the Student table with the given fields.

Quick Tip

CREATE TABLE is used to define table structure. Common data types: INT, VARCHAR, FLOAT, DATE.

---

8. Explain the difference between Degree and Cardinality of a table.

Solution: Concept: In relational databases, Degree and Cardinality are terms used to describe the structure and size of a table.
Degree of a Table:

- Degree refers to the number of columns (attributes) in a table.
- It defines the structure of the table.
- It remains fixed unless the table structure is altered.

Cardinality of a Table:

- Cardinality refers to the number of rows (records/tuples) in a table.
- It represents the amount of data stored.
- It changes whenever records are added or deleted.

Key Differences:

Degree	Cardinality
Number of columns	Number of rows
Defines structure	Defines size of data
Usually fixed	Changes frequently

Example: If a table `Student(RollNo, Name, Marks)` has 3 columns and 50 records:

- Degree = 3
- Cardinality = 50

Conclusion: Degree describes the number of attributes in a table, while cardinality describes the number of records stored in it.

Quick Tip

Degree = Columns (structure)
Cardinality = Rows (data count)

---

9. Explain the difference between a Hub and a Switch.

Solution: Concept: Hub and Switch are networking devices used to connect multiple computers in a local area network (LAN), but they differ in how they transmit data.
Hub:

- A hub is a basic networking device that operates at the Physical Layer (Layer 1) of the OSI model.
- It broadcasts incoming data to all connected devices.
- It does not filter or manage traffic.
- Lower performance due to collisions and congestion.

Switch:

- A switch operates at the Data Link Layer (Layer 2) of the OSI model.
- It sends data only to the intended device using MAC addresses.
- It reduces network collisions and improves efficiency.
- Provides better speed and performance than a hub.

Key Differences:

Hub	Switch
Layer 1 device	Layer 2 device
Broadcasts to all devices	Sends to specific device
No traffic control	Intelligent traffic management
More collisions	Fewer collisions
Slower performance	Faster performance

Conclusion: A hub broadcasts data to all devices without filtering, while a switch intelligently forwards data only to the intended recipient, making it more efficient.

Quick Tip

Hub = broadcast device (Layer 1)
Switch = intelligent forwarding device (Layer 2)
