--Question Starting--
1. Consider the following statements regarding the Relational Database Model:
I. Update anomalies can occur when multiple copies of the same data are not updated simultaneously.
II. Relational Calculus is a procedural query language.
III. Codd's 12th rule states that the database must support online backup and recovery.
Which of the following is correct?
(1) I and II only
(2) I and III only
(3) II and III only
(4) All of the above
Answer Key: 1
Solution:
? Statement I (Correct): Update anomalies are a common issue in database systems where the same data exists in multiple places; if all copies are not updated simultaneously, inconsistencies occur.
? Statement II (Incorrect): Relational Calculus is actually a non-procedural query language, allowing users to specify what data to retrieve without having to specify how to retrieve it.
? Statement III (Incorrect): Codd's 12th rule actually refers to the requirement for non-subversion, which means that if a system provides a low-level (record-at-a-time) interface, then that interface cannot be used to subvert the system, e.g., bypassing security rules and constraints.
Hence, Option (1) is the right answer.

--Question Starting--
2. Consider the following three statements related to Assembly Language and Machine Language:
I. Assembly language uses mnemonic codes while machine language consists of binary codes.
II. An assembler converts high-level programming into machine code.
III. Subroutines in assembly language improve modularity and code reuse but do not assist in reducing program execution time.
Which of the following is correct?
(1) I and II only
(2) I and III only
(3) II and III only
(4) All of the above
Answer Key: 4
Solution:
? Statement I (Correct): Assembly language simplifies the coding process by using mnemonic codes (e.g., ADD, SUB) which are easier for humans to remember, unlike machine language that uses binary codes directly understandable by the machine.
? Statement II (Incorrect): An assembler specifically converts assembly language into machine code, not high-level programming languages, which are instead handled by compilers or interpreters.
? Statement III (Correct): While subroutines in assembly language indeed improve modularity and code reuse, they also can optimize and reduce program execution time by avoiding code duplication and allowing repeated use of code blocks efficiently.
Hence, Option (4) is the right answer.

--Question Starting--
3. Evaluate the following statements concerning Digital Logic Circuits:
I. A multiplexer can route multiple input lines into a single line.
II. Boolean algebra is used to simplify the expressions of logic circuits, not to design them.
III. Memory units in digital circuits are typically built using sequential circuits.
Which of the following is correct?
(1) I and II only
(2) I and III only
(3) II and III only

(4) All of the above
Answer Key: 4
Solution:
? Statement I (Correct): Multiplexers are designed to take several input signals and by using select lines, route one of them to a single output line. This is essential in reducing the number of data paths needed in circuit design.
? Statement II (Incorrect): Boolean algebra is both used to simplify the expressions and design of logic circuits. It provides a formal way to express and manipulate logical statements and configurations, which is fundamental in the design process.
? Statement III (Correct): Memory units are typically built using sequential circuits because these circuits use past input states to determine future outputs. This property is essential for creating storage mechanisms in digital circuits.
Hence, Option (4) is the right answer.