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ASSERTION BASED QUESTION

1. Assertion (A): Logical operators can be used to join more than one relational expression
Reason (R): Logical operators are binary in nature
(a) Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A)
(b) Both Assertion (A) and Reason (R) are true and Reason (R) is not a correct explanation of Assertion (A)
(c) Assertion (A) is false and Reason (R) is true
(d) Assertion (A) is true and Reason (R) is false
2. Assertion (A): An array's size can dynamically change:
Reason (R): The size of the array has to specified in the beginning while declaring it.
(a) Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A)
(b) Both Assertion (A) and Reason (R) are true and Reason (R) is not a correct explanation of Assertion (A)
(c) Assertion (A) is false and Reason (R) is true
(d) Assertion (A) is true and Reason (R) is false
3. Assertion (A): An array variable is also known as a subscripted variable.
Reason (R) : In arrays, every element is represented with the help of its individual index.
(a) Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A)
(b) Both Assertion (A) and Reason (R) are true and Reason (R) is not a correct explanation of Assertion(A)
(c) Assertion (A) is true and Reason (R) is false
(d) Assertion (A) is false and Reason (R) is true
4. Assertion: "A tautology is a statement that is always true, regardless of the truth values of its variables."
Reason: "The negation of a tautology is always a contradiction."
a) Both Assertion and Reason are true, and Reason is the correct explanation of the Assertion.
b) Both Assertion and Reason are true, but Reason is not the correct explanation of the Assertion.
c) Assertion is true, but Reason is false.
d) Assertion is false, but Reason is true.
5. Assertion: Switch statements can only be used with integer data types in Java.
Reason: Switch statements are used to compare a single value against a list of possible values.
a) Both Assertion and Reason are true, and Reason is the correct explanation of the Assertion.

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b) Both Assertion and Reason are true, but Reason is not the correct explanation of the Assertion.

c) Assertion is true, but Reason is false.

d) Assertion is false, but Reason is true.

Explanation: While switch statements are often used with integer types, they can also be used with certain other data types like characters.

6. Assertion (A): Conditional statements allow a program to make decisions based on certain conditions.

Reason (R): They help in controlling the flow of the program by executing different code blocks depending on whether a condition is true or false.

(a) Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A)

(b) Both Assertion (A) and Reason (R) are true and Reason (R) is not a correct explanation of Assertion (A)

(c) Assertion (A) is false and Reason (R) is true

(d) Assertion (A) is true and Reason (R) is false

7. Assertion (A): $A = 0$ $B = 1$ $C = 0$ and $D = 1$ and minterm is $A'.B.C'.D$

Reason (R): The final sum term must be 0 so A and C are complemented.

(a) Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A)

(b) Both Assertion (A) and Reason (R) are true and Reason (R) is not a correct explanation of Assertion (A)

(c) Assertion (A) is false and Reason (R) is true

(d) Assertion (A) is true and Reason (R) is false

8. Assertion (A): Boolean algebra and binary number system are different from each other.

Reason (R): There are some basic operations like AND, OR and NOT which are performed only in Boolean algebra.

(a) Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A)

(b) Both Assertion (A) and Reason (R) are true and Reason (R) is not a correct explanation of Assertion (A)

(c) Assertion (A) is false and Reason (R) is true

(d) Assertion (A) is true and Reason (R) is false

9. Assertion (A): The base class and derived class are the terms used in abstraction.

Reason (R): The concept of extending a class to obtain another class is called inheritance.

(a) Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A)

(b) Both Assertion (A) and Reason (R) are true and Reason (R) is not a correct explanation of Assertion (A)

(c) Assertion (A) is false and Reason (R) is true

(d) Assertion (A) is true and Reason (R) is false

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10. Assertion (A): The “if-else” statement allows a program to execute different code blocks based on the evaluation of a condition.
Reason (R): It provides a way to create branching paths in the program’s execution flow.
(a) Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A)
(b) Both Assertion (A) and Reason (R) are true and Reason (R) is not a correct explanation of Assertion (A)
(c) Assertion (A) is false and Reason (R) is true
(d) Assertion (A) is true and Reason (R) is false
11. Assertion (A): A stack is a LIFO structure
Reason (R): Any new element pushed into the stack always gets positioned at the index after the last existing element in the stack.
(a) Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A)
(b) Both Assertion (A) and Reason (R) are true and Reason (R) is not a correct explanation of Assertion (A)
(c) Assertion (A) is false and Reason (R) is true
(d) Assertion (A) is true and Reason (R) is false
12. Assertion (A): JVM is a Java interpreter loaded in the computer memory as soon as Java is loaded
Reason (R): JVM is different for different platforms.
(a) Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A)
(b) Both Assertion (A) and Reason (R) are true and Reason (R) is not a correct explanation of Assertion (A)
(c) Assertion (A) is false and Reason (R) is true
(d) Assertion (A) is true and Reason (R) is false
Explanation:
Assertion (A) is true as JVM interprets the byte code and executes the Java program.
Reason (R) is true as JVM is different for different platforms such as Windows, Linux, MacOS etc. But here Reason (R) is not a correct explanation of Assertion (A).
13. Assertion (A): $A + A' = 1$ and $A \cdot A' = 0$
Reason (R): According to the complement properties sum as well as product of a variable and its complement must be 0 and 1 respectively.
(a) Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A)
(b) Both Assertion (A) and Reason (R) are true and Reason (R) is not a correct explanation of Assertion (A)
(c) Assertion (A) is false and Reason (R) is true
(d) Assertion (A) is true and Reason (R) is false
14. Assertion (A): NOR and NAND gates are referred as universal gates.

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Reason (R): Universal logic gates are used to realize other logic gates or logic circuits.

(a) Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A)

(b) Both Assertion (A) and Reason (R) are true and Reason (R) is not a correct explanation of Assertion (A)

(c) Assertion (A) is false and Reason (R) is true

(d) Assertion (A) is true and Reason (R) is false

15. Assertion (A): It is possible that a digital circuit gives the same output for different input voltages.

Reason (R): A digital circuit is also called logic circuit.

(a) Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A)

(b) Both Assertion (A) and Reason (R) are true and Reason (R) is not a correct explanation of Assertion (A)

(c) Assertion (A) is false and Reason (R) is true

(d) Assertion (A) is true and Reason (R) is false

Explanation: Due to different logical combination for different combinations of input give same output

16. Assertion (A): A queue is a FIFO data structure.

Reason (R): An ordered collection of items where insertion and deletion take place at the different end.

(a) Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A)

(b) Both Assertion (A) and Reason (R) are true and Reason (R) is not a correct explanation of Assertion (A)

(c) Assertion (A) is false and Reason (R) is true

(d) Assertion (A) is true and Reason (R) is false

17. Assertion (A): The converse of $p' \rightarrow q$ is $p \rightarrow q'$

Reason (R): The conditional statement obtained after interchanging antecedent and consequent

is called converse of the given statement

(a) Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A)

(b) Both Assertion (A) and Reason (R) are true and Reason (R) is not a correct explanation of Assertion (A)

(c) Assertion (A) is false and Reason (R) is true

(d) Assertion (A) is true and Reason (R) is false

18. Assertion (A): A Logic circuit is designed to realize a set of logical operations.

Reason (R): A Logic circuit is a circuit diagram drawn using same logic gates.

(a) Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A)

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- (b) Both Assertion (A) and Reason (R) are true and Reason (R) is not a correct explanation of Assertion (A)
- (c) Assertion (A) is false and Reason (R) is true
- (d) Assertion (A) is true and Reason (R) is false
19. Assertion (A): Using a loop is more efficient than writing repetitive code.
Reason (R): Loops help in reducing code redundancy and make maintenance easier.
(a) Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A)
- (b) Both Assertion (A) and Reason (R) are true and Reason (R) is not a correct explanation of Assertion (A)
- (c) Assertion (A) is false and Reason (R) is true
- (d) Assertion (A) is true and Reason (R) is false
20. Assertion (A): Arrays are used to store multiple values of the same data type in a single variable.
Reason (R): Arrays provide better memory utilization compared to individual variables.
(a) Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A)
- (b) Both Assertion (A) and Reason (R) are true and Reason (R) is not a correct explanation of Assertion (A)
- (c) Assertion (A) is false and Reason (R) is true
- (d) Assertion (A) is true and Reason (R) is false
- Explanation: Arrays do allow storage of multiple values, but they do not necessarily guarantee better memory utilization in all cases.
21. Assertion (A): Functions in programming help in modularizing code for better organization.
Reason (R): Functions allow code reusability by encapsulating a set of instructions that can be used multiple times.
(a) Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A)
- (b) Both Assertion (A) and Reason (R) are true and Reason (R) is not a correct explanation of Assertion (A)
- (c) Assertion (A) is false and Reason (R) is true
- (d) Assertion (A) is true and Reason (R) is false
22. Assertion (A): Object-oriented programming (OOP) promotes the concept of data encapsulation.
Reason (R): Data encapsulation in OOP ensures that data is kept private and can only be accessed through predefined methods.
(a) Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A)
- (b) Both Assertion (A) and Reason (R) are true and Reason (R) is not a correct explanation of Assertion (A)

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- (c) Assertion (A) is false and Reason (R) is true
(d) Assertion (A) is true and Reason (R) is false
23. Assertion (A): Object-oriented programming (OOP) emphasizes the concepts of inheritance and polymorphism.
Reason (R): Inheritance allows one class to inherit properties and behaviours from another, while polymorphism enables objects of different classes to be treated as objects of a common superclass.
(a) Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A)
(b) Both Assertion (A) and Reason (R) are true and Reason (R) is not a correct explanation of Assertion (A)
(c) Assertion (A) is false and Reason (R) is true
(d) Assertion (A) is true and Reason (R) is false
24. Assertion (A): Java is platform-independent due to its "Write Once, Run Anywhere" (WORA) capability.
Reason (R): Java code is compiled into bytecode, which can run on any platform with a compatible Java Virtual Machine (JVM).
(a) Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A)
(b) Both Assertion (A) and Reason (R) are true and Reason (R) is not a correct explanation of Assertion (A)
(c) Assertion (A) is false and Reason (R) is true
(d) Assertion (A) is true and Reason (R) is false
25. Assertion (A): A constructor is a special method in a class that is automatically called when an object is instantiated.
Reason (R): Constructors are used to initialize the object's state and perform setup tasks.
(a) Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A)
(b) Both Assertion (A) and Reason (R) are true and Reason (R) is not a correct explanation of Assertion (A)
(c) Assertion (A) is false and Reason (R) is true
(d) Assertion (A) is true and Reason (R) is false
26. Assertion (A): The "while" loop in Java executes a block of code repeatedly as long as the given condition is true.
Reason (R): It provides a way to implement indefinite iteration in a program.
(a) Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A)
(b) Both Assertion (A) and Reason (R) are true and Reason (R) is not a correct explanation of Assertion (A)
(c) Assertion (A) is false and Reason (R) is true
(d) Assertion (A) is true and Reason (R) is false

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27. Assertion (A): In Java, the "String" class is used to create and manipulate strings, and it is immutable.
Reason (R): Immutability ensures that once a string object is created, its value cannot be changed.
(a) Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A)
(b) Both Assertion (A) and Reason (R) are true and Reason (R) is not a correct explanation of Assertion (A)
(c) Assertion (A) is false and Reason (R) is true
(d) Assertion (A) is true and Reason (R) is false
28. Assertion (A): To call the abs () method, no object or class name is required.
Reason (R): All methods of Math class are class methods.
(a) Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A)
(b) Both Assertion (A) and Reason (R) are true and Reason (R) is not a correct explanation of Assertion (A)
(c) Assertion (A) is false and Reason (R) is true
(d) Assertion (A) is true and Reason (R) is false
29. Assertion (A): When A=1, B=0 and C=1, only gate 6 will activate and produce a high output
Reason (R): Decoder is a combinational circuit that is used to convert a number from binary form to a number in any required base.
(a) Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A)
(b) Both Assertion (A) and Reason (R) are true and Reason (R) is not a correct explanation of Assertion (A)
(c) Assertion (A) is false and Reason (R) is true
(d) Assertion (A) is true and Reason (R) is false
30. Assertion (A): The constructor defined in the super class is invoked with the help of 'super' keyword
Reason (R): The constructor of super class is not invoked implicitly while creating object for the subclass. The object of subclass will call the constructor of subclass itself.
(a) Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A)
(b) Both Assertion (A) and Reason (R) are true and Reason (R) is not a correct explanation of Assertion (A)
(c) Assertion (A) is false and Reason (R) is true
(d) Assertion (A) is true and Reason (R) is false

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31. Assertion (A): Canonical SOP form of $A+B = AB+AB'+A'B$

Reason (R): A Boolean expression is in canonical form when each sum or product term contain each of the literals

(a) Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A)

(b) Both Assertion (A) and Reason (R) are true and Reason (R) is not a correct explanation of Assertion (A)

(c) Assertion (A) is false and Reason (R) is true

(d) Assertion (A) is true and Reason (R) is false

32. Assertion (A): In an OR gate if the input is high, the output is high.

Reason (R): OR gate is the most basic gate with one input and one output.

(a) Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A)

(b) Both Assertion (A) and Reason (R) are true and Reason (R) is not a correct explanation of Assertion (A)

(c) Assertion (A) is false and Reason (R) is true

(d) Assertion (A) is true and Reason (R) is false

Explanation : An OR gate has two or more inputs with one output. NOT gate is the most basic gate with one input and one output. In an OR gate if any of the input is high the output will also be high.

33. Assertion (A): In Boolean algebra, the OR operation returns a true value if any of the input variables is true.

Reason (R): The OR operation follows the logical rule that if any of the inputs is true, the output will be true.

(a) Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A)

(b) Both Assertion (A) and Reason (R) are true and Reason (R) is not a correct explanation of Assertion (A)

(c) Assertion (A) is false and Reason (R) is true

(d) Assertion (A) is true and Reason (R) is false

34. Assertion (A): Dual of $(a'+b).C$ is $a.b'+c'$

Reason (R): To calculate dual, convert all \cdot (dot) to $+$ and vice versa, and convert all 0 to 1 and vice versa.

(a) Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A)

(b) Both Assertion (A) and Reason (R) are true and Reason (R) is not a correct explanation of Assertion (A)

(c) Assertion (A) is false and Reason (R) is true

(d) Assertion (A) is true and Reason (R) is false

35. Assertion (A): In general insertion sort takes less time than selection sort.

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Reason (R): Time complexity of both Selection sort and insertion sort is $O(n^2)$.

(a) Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A)

(b) Both Assertion (A) and Reason (R) are true and Reason (R) is not a correct explanation of Assertion (A)

(c) Assertion (A) is false and Reason (R) is true

(d) Assertion (A) is true and Reason (R) is false

36. Assertion (A): $A + A' = 1$ and $A \cdot A' = 0$

Reason (R): According to the complement properties sum as well as product of a variable and its complement must be 0 and 1 respectively.

(a) Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A)

(b) Both Assertion (A) and Reason (R) are true and Reason (R) is not a correct explanation of Assertion (A)

(c) Assertion (A) is false and Reason (R) is true

(d) Assertion (A) is true and Reason (R) is false

37. Assertion (A): In Java, statements written in lower case letter or upper-case letter are treated as same

Reason (R): Java is a case sensitive language.

(a) Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A)

(b) Both Assertion (A) and Reason (R) are true and Reason (R) is not a correct explanation of Assertion (A)

(c) Assertion (A) is false and Reason (R) is true

(d) Assertion (A) is true and Reason (R) is false

38. Assertion (A): Call by value is known as pure method

Reason (R): The original value of variable does not change as operation is performed on copied values.

(a) Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A)

(b) Both Assertion (A) and Reason (R) are true and Reason (R) is not a correct explanation of Assertion (A)

(c) Assertion (A) is false and Reason (R) is true

(d) Assertion (A) is true and Reason (R) is false

39. Assertion (A): Each of Java's eight primitive data type has a wrapper class dedicated to it.

Reason (R): Wrapper classes wrap the primitive data types into an object of that class so that they can perform the activities reserved for the objects.

(a) Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A)

(b) Both Assertion (A) and Reason (R) are true and Reason (R) is not a correct explanation of Assertion (A)

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- (c) Assertion (A) is false and Reason (R) is true
(d) Assertion (A) is true and Reason (R) is false
40. Assertion (A): The infinite loop never terminates.
Reason (R): In the infinite loop, there is a condition that never returns false.
(a) Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A)
(b) Both Assertion (A) and Reason (R) are true and Reason (R) is not a correct explanation of Assertion (A)
(c) Assertion (A) is false and Reason (R) is true
(d) Assertion (A) is true and Reason (R) is false
41. Assertion (A): A variable declared within the body of a method cannot be accessed outside the method
Reason (R): The variables declared within the body of a method are called local variables
(a) Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A)
(b) Both Assertion (A) and Reason (R) are true and Reason (R) is not a correct explanation of Assertion (A)
(c) Assertion (A) is false and Reason (R) is true
(d) Assertion (A) is true and Reason (R) is false
42. Assertion (A): A static member variable can be accessed only in the static methods without associating with an object
Reason (R): Non-static member variables can be accessed in static methods by associating them with objects separated by a dot
(a) Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A)
(b) Both Assertion (A) and Reason (R) are true and Reason (R) is not a correct explanation of Assertion (A)
(c) Assertion (A) is false and Reason (R) is true
(d) Assertion (A) is true and Reason (R) is false
43. Assertion (A): The main function is the most important function in a java program
Reason (R): The main function is called by the import keyword.
(a) Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A)
(b) Both Assertion (A) and Reason (R) are true and Reason (R) is not a correct explanation of Assertion (A)
(c) Assertion (A) is false and Reason (R) is true
(d) Assertion (A) is true and Reason (R) is false
44. Assertion (A): Non-static variables are called local variables
Reason (R): Every object created from a class definition will have its own copy of the variable

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- (a) Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A)
(b) Both Assertion (A) and Reason (R) are true and Reason (R) is not a correct explanation of Assertion (A)
(c) Assertion (A) is false and Reason (R) is true
(d) Assertion (A) is true and Reason (R) is false
45. Assertion (A): In the call by reference, the changes in formal parameters will be reflected in the actual parameters
Reason (R): The formal parameters will be the reference variables when the function is called by reference
(a) Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A)
(b) Both Assertion (A) and Reason (R) are true and Reason (R) is not a correct explanation of Assertion (A)
(c) Assertion (A) is false and Reason (R) is true
(d) Assertion (A) is true and Reason (R) is false
46. Assertion (A): An integer array which stores 10 elements needs 40 bytes for storage
Reason (R): The storage for an integer array is determined by multiplying 4 bytes per element by the total number of elements
(a) Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A)
(b) Both Assertion (A) and Reason (R) are true and Reason (R) is not a correct explanation of Assertion (A)
(c) Assertion (A) is false and Reason (R) is true
(d) Assertion (A) is true and Reason (R) is false
47. Assertion (A): Linear Search can be applied even if the array is not sorted
Reason (R): In linear search the search operation begins from first element and goes till the last element
(a) Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A)
(b) Both Assertion (A) and Reason (R) are true and Reason (R) is not a correct explanation of Assertion (A)
(c) Assertion (A) is false and Reason (R) is true
(d) Assertion (A) is true and Reason (R) is false
48. Assertion (A): Binary search is faster than linear search
Reason (R): Binary search takes place on sorted array
(a) Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A)
(b) Both Assertion (A) and Reason (R) are true and Reason (R) is not a correct explanation of Assertion (A)
(c) Assertion (A) is false and Reason (R) is true

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- (d) Assertion (A) is true and Reason (R) is false
49. Assertion (A): The commutative property states that the operands on which we operate can be moved or swapped from their position without making any difference to the answer
Reason (R): This statement always holds true irrespective of the nature of the operand.
(a) Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A)
(b) Both Assertion (A) and Reason (R) are true and Reason (R) is not a correct explanation of Assertion (A)
(c) Assertion (A) is false and Reason (R) is true
(d) Assertion (A) is true and Reason (R) is false
50. Assertion (A): The index of last element of an array is equal to the number of elements in the array.
Reason (R): Index of an array begins from zero
(a) Both Assertion (A) and Reason (R) are true and Reason (R) is a correct explanation of Assertion (A)
(b) Both Assertion (A) and Reason (R) are true and Reason (R) is not a correct explanation of Assertion (A)
(c) Assertion (A) is false and Reason (R) is true
(d) Assertion (A) is true and Reason (R) is false