

Entrance Exam

Core Computer Science Section (Sample Questions)

1. Which of the following is true about the Big O notation for constant time complexity?

- a) It is denoted as $O(1)$
- b) It is denoted as $O(\log n)$
- c) It is denoted as $O(n)$
- d) It is denoted as $O(n^2)$

Answer: A

2. Which of the following state-space search methods makes the most efficient use of memory?

- A. breadth-first search
- B. depth-first search
- C. Both are equivalent

Ans: A

3. Consider the following recursive method:

```
procedure recursiveSum(n):  
    if n == 1:  
        return 1  
    else:  
        return n + recursiveSum(n - 1)
```

What does recursiveSum(4) evaluate to?

- A. 6
- B. 10
- C. 15
- D. 20
- E. 24

Answer: B

4. In a multithreading environment, what is a thread?

- A. A process in execution
- B. A program in execution
- C. A lightweight, independent unit of execution within a process
- D. A user interface element

Answer: C

5. In graph theory, what is the purpose of Dijkstra's algorithm?

- A. Finding the shortest path in a weighted graph
- B. Detecting cycles in a graph
- C. Performing topological sorting
- D. Traversing a graph in a depth-first manner

Answer: A

6. In how many ways can you arrange the letters of the word "COMPUTER"?
- a. 8!
 - b. 2×8
 - c. 88
 - d. None of the above

Ans: A

7. What is the primary advantage of dynamic programming in algorithm design?
- a) It reduces the time complexity of algorithms
 - b) It reduces the space complexity of algorithms
 - c) It breaks down a problem into smaller subproblems and solves each subproblem only once
 - d) It is particularly effective for sorting large datasets

Answer: c)

8. In terms of space complexity, which of the following statements is true for recursive algorithms?
- a) Recursive algorithms always have $O(1)$ space complexity
 - b) Recursive algorithms always have $O(n)$ space complexity
 - c) Recursive algorithms may have $O(1)$ or $O(n)$ space complexity
 - d) Recursive algorithms do not use any space

Answer: c)

9. Following sequence of operation is performed on a stack. Push(1), Push(2), Pop, Push(1), Push(2), Pop, Pop, Pop, Push(2), Pop. The sequences of popped out values are
- A. 2,2,1,2,2
 - B. 2,2,1,1,2
 - C. 2,1,2,2,2
 - D. 2,1,2,2,1

Ans: C

10. Which SQL keyword is used to retrieve only unique values
- A. Distinctive
 - B. Unique
 - C. Distinct
 - D. Different

Ans: C