# Sample Paper

1. If an optimal solution can be created for a problem by constructing optimal solutions for its subproblems, the problem possesses _____ property.

a) Overlapping subproblems b) Optimal substructure c) Memoization d) Greedy

Topic: DP Difficulty: 1

2. Write a C++ program to find k largest elements in a given array of integers.

Topic: ARRAY Difficulty: 5

3. Consider a complete binary tree where the left and the right subtrees of the root are max-heaps. The lower bound for the number operations to convert the tree to a heap is

Topic: HEAP Difficulty: 2

4. C++ Program to Implement Shortest Path Algorithm for DAG Using Topological Sorting

Topic: GRAPH Difficulty: 2

5. Evaluation of Postfix Expression

Topic: STACK Difficulty: 5

6. Explain how to find 100 largest numbers out of an array of 1 billion numbers

Topic: SORTING Difficulty: 3

7. Find all binary strings that can be formed from a wildcard pattern

Topic: BACKTRACKING Difficulty: 5

8. How to implement Linked List Using Stack?

Topic: LINKED LIST Difficulty: 9

9. Program for A Program to check if strings are rotations of each other or not

Topic: STRING Difficulty: 9

10. An implementation of a queue Q, using two stacks S1 and S2, is given

below: void insert(Q, x) { push (S1, x); } void delete(Q){ if(stack-empty(S2)) then if(stack-empty(S1)) then { print(Q is empty); return; } else while (!(stack-empty(S1))){ x=pop(S1); push(S2,x); } x=pop(S2); } Run on IDE Let n insert and m (<=n) delete operations be performed in an arbitrary order on an empty queue Q. Let x and y be the number of push and pop operations performed respectively in the process. Which one of the following is true for all m and n?

Topic: QUEUE Difficulty: 5