# C:\Users\NRCM\Downloads\images.jpgNARSIMHA REDDY ENGINEERING COLLEGE (UGC AUTONOMOUS)

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III B.Tech II Semester (R20) II Midterm Examinations, JUNE 2023

# Design and analysis of algorithm – Set-1

(CSE)

## Date: 15-06-2023 Time:11:00 AM to 11:20 AM Max.Marks:10

Answer all questions. Each question carries 0.5 Mark

**\*\*\*\*\***

I. Choose the correct alternative answer for the following question

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1. | Dijkstra’s algorithm | | [ | ] |
|  | (a) Has greedy approach to find all shortest paths  (c) Has greedy approach to compute single source shortest paths to all other vertices | (b) Has both greedy and dynamic approach to find all shortest paths  (d) Has both greedy and dynamic approach to compute single source shortest paths to all other vertices |  | |
| 2. | Which of the following statements is true about Kruskal’s algorithm | | [ | ] |
|  | (a) It is inefficient algorithm, and it never gives the minimum spanning tree  (c) It is an efficient algorithm, and it does not always gives the minimum spanning tree | (b) It is an efficient algorithm, and it always gives the minimum spanning tree  (d) It is inefficient algorithm, and it always gives the minimum spanning tree |  | |
| 3. | What is the time complexity of 0/1 Knapsack problem | | [ | ] |
|  | (a) O(n)  (c) O(2n/2) | (b) O(n2)  (d) O(n3) |  | |
| 4. | Which of the following divides a set S of candidates into two or more sets such that their union covers S | | [ | ] |
|  | (a) Branching  (c) Backtracking | (b) Bounding  (d) Approximation |  | |
| 5. | Branch and bound technique is applicable for only | | [ | ] |
|  | (a) Minimization problem  (c) Reliability Design problem | (b) Maximization problem  (d) BFS Algorithm |  | |
| 6. | Which of the following technique is used to solve graph coloring problem | | [ | ] |
|  | (a) Divide and Conquer  (c) Backtracking | (b) Dynamic programming  (d) Branch and Bound |  | |
| 7. | Which of the following search technique is used in backtracking | | [ | ] |
|  | (a) Linear  (c) BFS | (b) DFS  (d) Binary |  | |
| 8. | Which method can be used when the solution to a problem can be viewed as the result of a sequence of decisions | | [ | ] |
|  | (a) Greedy method  (c) Dynamic programming | (b) Divide & conquer  (d) none |  | |
| 9. | Assuming P != NP, which of the following is true ? | | [ | ] |
|  | (a) NP-complete = NP  (c) NP-hard = NP | (b) NP-complete P  (d) P = NP-complete |  | |
| 10. | Which of the following is a generated node that cannot be expanded further? |  | [ ] | |
|  | (a) E-node (b)Dead node  (c) Live Node (d) Null node |  |  | |

**II . Fill in the Blanks**

**1.** In all pairs shortest path problem, the shortest path between\_\_\_\_\_\_\_\_ in a graph

**2.** An optimal code for a file is always represented by a\_\_\_\_\_\_ in which every non leaf node has two children

3. A tree which includes all vertices in a graph G is called\_\_\_\_\_\_\_\_\_\_\_\_

4. The Knapsack problem belongs to the domain \_\_\_\_\_\_\_\_\_\_\_\_\_problem

5.\_\_\_\_\_\_\_\_\_\_\_\_ is the time complexity for travelling sales man problem solved by dynamic programming.

6. \_\_\_\_\_\_\_\_\_\_\_\_\_rules are used to solve 0/1 knapsack

7. The travelling sales person problem which asked for a tour that has minimum cost. Then this tour is\_\_\_\_\_

8. The \_\_\_\_\_\_\_\_\_time complexity of 8-queens problem.

9. Sum of subsets is an example of\_\_\_\_\_\_\_\_\_\_ problem.

10.\_\_\_\_\_\_\_\_\_\_\_\_ is the time complexity of sum of subsets problem.

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III B.Tech II Semester (R20) II Midterm Examinations, JUNE 2023

# Design and analysis of algorithm – Set-2

(CSE )

Date: 15-06-2023 Time:11:00 AM to 11:20 AM Max.Marks:10

Answer all questions. Each question carries 0.5 Mark

**\*\*\*\*\***

1. Choose the correct alternative answer for the following question

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1. | Kruskals algorithm is used to construct | | [ | c] |
|  | (a)  binary tree (c) Minimum spanning tree | (b) BST  (d) none |  | |
| 2. | Which method can be used when the solution to a problem can be viewed as the result of a sequence of decisions | | [b | ] |
|  | (a) Greedy method  (c)  Dynamic programming | (b) Divide & conquer  (d) none |  | |
| 3. | If an NP complete problem is solvable in polynomial time | | [ | ] |
|  | (a) P=NP  (c)  P | (b) P!=NP  (d) NP |  | |
| 4. | We start at a particular node in a graph visiting all nodes exactly once and come back to initial node with minimum cost. This is known as | | [ | b] |
|  | (a) 0/1 knapsack problem  (c) Minimum cost spanning trees | (b) Optimal storage on tapes  (d) Travelling sales person problem |  | |
| 5. | If there are n nodes then possible binary search trees are | | [c | ] |
|  | (a) N  (c) (1/N+1) 2NCN | (b) N+1  (d) NC2 |  | |
| 6. | Which of the following search technique is used in backtracking | | [ | b] |
|  | (a) Linear  (c) BFS | (b) DFS  (d) Binary |  | |
| 7. | The time required by prims algorithm is | | [ | a] |
|  | (a) O(n)  (c) Ɵ (n2 ) | (b) Ɵ (n )  (d) O (n2 ) |  | |
| 8. | The recursive versions of binary search use a structure. | | [ | a] |
|  | (a) Branch and bound  (c) Divide and conquer | (b) Dynamic programming  (d) Simple recursive |  | |
| 9. | The optimization technique for particular classes of backtracking algorithms that repeatedly solve sub-problems. | | [ | a] |
|  | 1. Decrease and conquer (b) Dynamic programming   ( c) Branch and bound (d) Divide and Conquer | |  |  |
| 10. | The root node in the B-Tree technique has limit on the number of children? | | [ | b] |
|  | (a) Lower  (c) Upper | (b) Upper and Lower  (d) No |  | |

**II .Fill in the blanks**

1)\_\_ Kruskal \_\_\_\_\_\_ Algorithm technique is used in the implementation of Kruskal solution for the MST.

2)\_\_\_\_\_\_\_\_\_\_\_Property satifies the optional substructure property then a locally optimal solution is globally optimal.

3) Dynamic programming belongs \_\_\_\_\_\_\_to class.

4) \_\_\_\_\_\_\_\_is a BFS like state space tree search in which the list of live nodes is a queue.

5) The travelling sales person problem which asked for a tour that has minimum cost. Then this tour is\_\_\_\_\_\_\_

6) The time complexity of 8-queens problem\_\_\_\_\_\_\_\_

7) Sum of subsets is an example of\_\_\_\_\_\_\_\_\_\_ problem

8) For N queens problem the time complexity\_\_\_\_\_\_\_\_

9) State generation methods in which in the E-node remains the E-node until it is dead is called\_\_\_\_\_\_\_\_\_\_\_

10) If an NP hard problem can be solved in polynomial time then all\_\_\_\_\_ problems can be solved in polynomial time.