Subject : Design and Analysis of Algorithms

Class : III -I AIDS

Department : Artificial Intelligence & Data Science

1. The Bellmann Ford Algorithm returns \_\_\_\_\_\_\_\_\_\_  value? [ ]

1. String
2. Double
3. Boolean
4. Integer

2. Which of the following is used for solving the N Queens Problem? [ ]

1. Greedy algorithm
2. Dynamic programming
3. Backtracking
4. Sorting

3. Another name of the fractional knapsack is? [ ]

1. Non-continuous knapsack problem
2. Divisible knapsack problem
3. 0/1 knapsack problem
4. Continuous Knapsack Problem

4. Identify the approach followed in Floyd Warshall’s algorithm? [ ]

1. Linear programming
2. Dynamic Programming
3. Greedy Technique
4. Backtracking

5. What is the time complexity of the following code snippet in C++? [ ]

voidsolve() {

string s = "scaler";

int n = s.size();

for(int i = 0; i < n; i++) {

s = s + s[i];

}

cout<< s <<endl;

}

1. O(n)
2. O(n^2)
3. O(1)
4. O(log n)

6. What is the technique called in which it does not require extra memory for carrying out the sorting procedure? [ ]

1. Stable
2. Unstable
3. In-place
4. In-partition

7. Which of the following algorithms are used to find the shortest path from a source node to all other nodes in a weighted graph? [ ]

1. BFS
2. Djikstra’s Algorithm
3. Prims Algorithm
4. Kruskal’s Algorithm

8. Kruskal’s Algorithm for finding the Minimum Spanning Tree of a graph is a kind of a? [ ]

1. DP Problem
2. Greedy Algorithm
3. Adhoc Problem
4. None of the above

9. Which of the following algorithms are used for string and pattern matching problems? [ ]

1. Z Algorithm
2. Rabin Karp Algorithm
3. KMP Algorithm
4. All of the above

10. What is the best time complexity we can achieve to precompute all-pairs shortest paths in a weighted graph? [ ]

1. O(n^3)
2. O(n^2)
3. O(n)
4. O(n^4)

11. The time complexity to find the longest common subsequence of two strings of length M and N is? [ ]

1. O(N)
2. O(M \* N)
3. O(M)
4. O(log N)

12. Which of the problems cannot be solved by backtracking method? [ ]

1. n-queen problem
2. subset sum problem
3. hamiltonian circuit problem
4. travelling salesman problem

13. Backtracking algorithm is implemented by constructing a tree of choices called as? [ ]

1. State-space tree
2. State-chart tree
3. Node tree
4. Backtracking tree

14. What happens when the backtracking algorithm reaches a complete solution? [ ]

1. It backtracks to the root
2. It continues searching for other possible solutions
3. It traverses from a different route
4. Recursively traverses through the same route

15. A node is said to be \_\_\_\_\_\_\_\_\_\_\_\_ if it has a possibility of reaching a complete solution.

1. Non-promising
2. Promising
3. Succeeding
4. Preceding

16. In what manner is a state-space tree for a backtracking algorithm constructed? [ ]

1. Depth-first search
2. Breadth-first search
3. Twice around the tree
4. Nearest neighbour first

17. The leaves in a state-space tree represent only complete solutions. [ ]

1. True
2. False

18. In general, backtracking can be used to solve? [ ]

1. Numerical problems
2. Exhaustive search
3. Combinatorial problems
4. Graph coloring problems

19. Which one of the following is an application of the backtracking algorithm? [ ]

1. Finding the shortest path
2. Finding the efficient quantity to shop
3. Ludo
4. Crossword

20. Backtracking algorithm is faster than the brute force technique [ ]

1. True
2. False

21.Which of the following logical programming languages is not based on backtracking? [ ]

1. Icon
2. Prolog
3. Planner
4. Fortran

22. The problem of finding a list of integers in a given specific range that meets certain [ ]

conditions is called?

1. Subset sum problem
2. Constraint satisfaction problem
3. Hamiltonian circuit problem
4. Travelling salesman problem

23. Who coined the term ‘backtracking’? [ ]

1. Lehmer
2. Donald
3. Ross
4. Ford

24. The problem of finding a subset of positive integers whose sum is equal to a given positive integer is called as? [ ]

1. n- queen problem
2. subset sum problem
3. knapsack problem
4. hamiltonian circuit problem

25. The problem of placing n queens in a chessboard such that no two queens attack each other is called as? [ ]

1. n-queen problem
2. eight queens puzzle
3. four queens puzzle
4. 1-queen problem

26. If an optimal solution can be created for a problem by constructing optimal solutions for its subproblems, the problem possesses \_\_\_\_\_\_\_\_\_\_\_\_ property. [ ]

1. Overlapping subproblems
2. Optimal substructure
3. Memoization
4. Greedy

27. If a problem can be broken into subproblems which are reused several times, the problem possesses \_\_\_\_\_\_\_\_\_\_\_\_ property. [ ]

1. Overlapping subproblems
2. Optimal substructure
3. Memoization
4. Greedy

28. In dynamic programming, the technique of storing the previously calculated values is called \_\_\_\_\_\_\_\_\_\_\_ [ ]

1. Saving value property
2. Storing value property
3. Memoization
4. Mapping

29. When a top-down approach of dynamic programming is applied to a problem, it usually \_\_\_\_\_\_\_\_\_\_\_\_\_ [ ]

1. Decreases both, the time complexity and the space complexity
2. Decreases the time complexity and increases the space complexity
3. Increases the time complexity and decreases the space complexity
4. Increases both, the time complexity and the space complexity

30. Which of the following problems is NOT solved using dynamic programming? [ ]

1. 0/1 knapsack problem
2. Matrix chain multiplication problem
3. Edit distance problem
4. Fractional knapsack problem

31. Which of the following methods can be used to solve the Knapsack problem? [ ]

1. Brute force algorithm
2. Recursion
3. Dynamic programming
4. Brute force, Recursion and Dynamic Programming

32. You are given a knapsack that can carry a maximum weight of 60. There are 4 items with weights {20, 30, 40, 70} and values {70, 80, 90, 200}. What is the maximum value of the items you can carry using the knapsack? [ ]

1. 160
2. 200
3. 170
4. 90

33. When was the Eight Queen Puzzle published? [ ]

1. 1846
2. 1847
3. 1848
4. 1849

 34. For how many queens was the extended version of Eight Queen Puzzle applicable for n\*n squares? [ ]

1. 5
2. 6
3. 8
4. n

35. How many solutions are there for 8 queens on 8\*8 board? [ ]

1. 12
2. 91
3. 92
4. 93

36. Who publish the bitwise operation method to solve the eight queen puzzle? [ ]

1. ZongyanQiu
2. Martin Richard
3. Max Bezzel
4. Frank Nauck

37. Which ordered board is the highest enumerated board till now? [ ]

1. 25\*25
2. 26\*26
3. 27\*27
4. 28\*28

38. Floyd Warshall’s Algorithm is used for solving \_\_\_\_\_\_\_\_\_\_\_\_ [ ]

1. All pair shortest path problems
2. Single Source shortest path problems
3. Network flow problems
4. Sorting problems

39. Floyd Warshall’s Algorithm can be applied on \_\_\_\_\_\_\_\_\_\_ [ ]

1. Undirected and unweighted graphs
2. Undirected graphs
3. Directed graphs
4. Acyclic graphs

40. What is the running time of the Floyd Warshall Algorithm? [ ]

1. Big-oh(V)
2. Theta(V2)
3. Big-Oh(VE)
4. Theta(V3)

41. What approach is being followed in Floyd Warshall Algorithm? [ ]

1. Greedy technique
2. Dynamic Programming
3. Linear Programming
4. Backtracking

42. Floyd Warshall Algorithm can be used for finding \_\_\_\_\_\_\_\_\_\_\_\_\_ [ ]

1. Single source shortest path
2. Topological sort
3. Minimum spanning tree
4. Transitive closure

43. What procedure is being followed in Floyd Warshall Algorithm? [ ]

1. Top down
2. Bottom up
3. Big bang
4. Sandwich

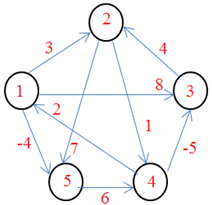
 44. Floyd- Warshall algorithm was proposed by \_\_\_\_\_\_\_\_\_\_\_\_ [ ]

1. Robert Floyd and Stephen Warshall
2. Stephen Floyd and Robert Warshall
3. Bernad Floyd and Robert Warshall
4. Robert Floyd and BernadWarshall

45. What happens when the value of k is 0 in the Floyd Warshall Algorithm? [ ]

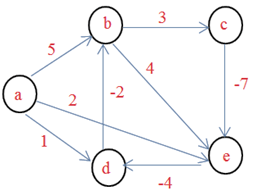
1. 1 intermediate vertex
2. 0 intermediate vertex
3. N intermediate vertices
4. N-1 intermediate vertices

46. In the given graph, what is the minimum cost to travel from vertex 1 to vertex 3? [ ]



1. 3
2. 2
3. 10
4. -3

47. In the given graph, how many intermediate vertices are required to travel from node a to node e at a minimum cost? [ ]



1. 2
2. 0
3. 1
4. 3

48. What is the formula to compute the transitive closure of a graph? [ ]

1. tij(k) = tij(k-1) AND (tik(k-1) OR tkj(k-1))
2. tij(k) = tij(k-1) OR (tik(k-1) AND tkj(k-1))
3. tij(k) = tij(k-1) AND (tik(k-1) AND tkj(k-1))
4. tij(k) = tij(k-1) OR (tik(k-1) OR tkj(k-1))

### 49. \_\_\_\_\_\_is the first step in solving the problem [ ]

### A. Understanding the Problem B. Identify the Problem

### C. Evaluate the Solution D. None of these

50. There are four algorithms A1, A2, A3, A4 to solve the given problem with the order log(n), nlog(n), log(log(n)), n/log(n), Which is the best algorithm.

A. A1 B. A2 [ ]

C. A3 D. A4

51. Which of the problems cannot be solved by backtracking method?

a) n-queen problem b) sum of subset problem [ ]

c) hamiltonian circuit problem d) travelling salesman problem

52. Backtracking algorithm is implemented by constructing a tree of choices called as?

a) State-space tree b) State-chart tree [ ]

c) Node tree d) Backtracking tree

53. A node is said to be \_\_\_\_\_\_\_\_\_\_\_\_ if it has a possibility of reaching a complete solution.

a) Non-promising b) Promising [ ]

c) Succeeding d) Preceding

54. Backtracking algorithm is faster than the brute force technique

a) true [ ]

b) false

55. The problem of finding a subset of positive integers whose sum is equal to a given positive integer is called as?

a) n- queen problem b) subset sum problem [ ]

c) knapsack problem d) hamiltonian circuit problem

56. The problem of placing n queens in a chessboard such that no two queens attack each other is called as? [ ]

a) n-queen problem b) eight queens puzzle

c) four queens puzzle d) 1-queen problem

57. How many fundamental solutions are there for the eight queen puzzle? [ ]

a) 92 b) 10

c) 11 d) 12

58. In what manner is a state-space tree for a backtracking algorithm constructed?

1. Depth-first search b. Breadth-first search [ ]

c. Twice around the tree d. Nearest neighbour first

59. Which of the following is not a type of graph in computer science?

a) undirected graph b) bar graph [ ]

c) directed graph d) weighted graph

60. Minimum number of unique colors required for vertex coloring of a graph is called?

a) vertex matching b) chromatic index [ ]

c) chromatic number d) color number

61. Which of the following statements is true for Branch - and - Bound search? [ ]

a. Underestimates of remaining distance may cause deviation from optimal path

b. Overestimates can't cause right path to be overlooked

c. Dynamic programming principle can be used to discard redundant partial paths

d. All of the above

62. Which of the following problems should be solved using dynamic programming?

a) Mergesort b) Binary search [ ]

c) Longest common subsequence d) Quicksort

63. A greedy algorithm can be used to solve all the dynamic programming problems. [ ]

a) True b) False

64. The 0-1 Knapsack problem can be solved using Greedy algorithm. [ ]

a) True b) False

65. Which of the following methods can be used to solve the Knapsack problem? [ ]

a) Brute force algorithm b) Recursion

c) Dynamic programming d) Brute force, Recursion and Dynamic Programming

66. The leaves in a state-space tree represent only complete solutions. [ ]

A.true B. false