Online Examinations (Even Sem/Part-I/Part-II Examinations 2020 - 2021

Course Name - –Design and Analysis of Algorithm
Course Code - BCSE401

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Answer all the questions. Each question carry one mark.

9. 1. Best case in inse1. Which of the following is/are property/properties of a dynamic programming problem?rtion sort occurs when

Mark only one oval.

- [ ] Optimal substructure
- [ ] Overlapping sub problems
- [ ] Both optimal substructure and overlapping sub problems
- [ ] Greedy approach

10. 2. If a problem can be solved by combining optimal solutions to non-overlapping problems, the strategy is called _____

Mark only one oval.

- Dynamic programming
- Greedy
- Divide and conquer
- Recursion

11. 3. In dynamic programming, the technique of storing the previously calculated values is called _____

Mark only one oval.

- Saving value property
- Storing value property
- Memorization
- Mapping

12. 4. When a top-down approach of dynamic programming is applied to a problem, it usually _____

Mark only one oval.

- Decreases both, the time complexity and the space complexity
- Increases the time complexity and decreases the space complexity
- Decreases the time complexity and increases the space complexity
- Increases both, the time complexity and the space complexity

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

Mark only one oval.

- Merge sort
- Binary search
- Longest common subsequence
- Quicksort

14. 6. The 0/1 Knapsack problem is an example of _____

Mark only one oval.

- Greedy algorithm
- 1D dynamic programming
- 2D dynamic programming
- Divide and conquer

15. 7. 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?

Mark only one oval.

- 200
- 170
- 160
- 90

16. 8. Consider the two matrices P and Q which are 10 x 20 and 20 x 30 matrices respectively. What is the number of multiplications required to multiply the two matrices?

Mark only one oval.

- 10 X 20
- 20 X 30
- 10 X 20 X 30
- 10 X 30

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

Mark only one oval.

- n-queen problem
- Subset sum problem
- Travelling salesman problem
- Hamiltonian circuit problem

18. 10. What happens when the backtracking algorithm reaches a complete solution?

Mark only one oval.

- It backtracks to the root
- It traverses from a different route
- It continues searching for other possible solutions
- Recursively traverses through the same route

19. 11. Recursively traverses through the same route

Mark only one oval.

- ◯ Twice around the tree
- ◯ Breadth-first search
- ◯ Depth-first search
- ◯ Nearest neighbor first

20. 12. Which one of the following is an application of the backtracking algorithm?

Mark only one oval.

- ◯ Finding the shortest path
- ◯ Finding the efficient quantity to shop
- ◯ Crossword
- ◯ Ludo

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

Mark only one oval.

- ◯ Icon
- ◯ Prolog
- ◯ Fortran
- ◯ Planner

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

Mark only one oval.

- n- queen problem
- Knapsack problem
- Subset sum problem
- Hamiltonian circuit problem

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

Mark only one oval.

- Four queens puzzle
- Eight queens puzzle
- n-queen problem
- 1-queen problem

24. 16. For how many queens was the extended version of Eight Queen Puzzle applicable for n X n squares?

Mark only one oval.

- 5
- 6
- n
- 8

25. 17. How many solutions are there for 8 queens on 8 X 8 board?

Mark only one oval.

- 12
- 91
- 92
- 93

26. 18. How many fundamental solutions are there for the eight queen puzzle?

Mark only one oval.

- 92
- 10
- 12
- 11

27. 19. Of the following given options, which one of the following does not provides an optimal solution for 8-queens problem?

Mark only one oval.

- 5,3,8,4,7,1,6,2
- 4,1,5,8,6,3,7,2
- 1,6,3,8,3,2,4,7
- 6,2,7,1,4,8,5,3

28. 20. How many possible solutions occur for a 10-queen problem?

Mark only one oval.

- 850
- 742
- 724
- 842

29. 21. Of the following given options, which one of the following is a correct option that provides an optimal solution for 4-queens problem?

Mark only one oval.

- 2,3,1,4
- 4,3,2,1
- 3,1,4,2
- 4,2,3,1

30. 22. Which of the following methods can be used to solve n-queen's problem?

Mark only one oval.

- Greedy algorithm
- Divide and conquer
- Backtracking
- Iterative improvement

31. 23. In n-queen problem, how many values of n does not provide an optimal solution?

Mark only one oval.

- 1
- 3
- 2
- 4

32. 24. In how many directions do queens attack each other?

Mark only one oval.

- 1
- 2
- 3
- 4

33. 25. Given items as {value,weight} pairs {{60,20},{50,25},{20,5}}. The capacity of knapsack=40. Find the maximum value output assuming items to be divisible and non-divisible respectively.

Mark only one oval.

- 100, 80
- 110, 70
- 110, 80
- 130, 110

34. 26. The main time taking step in fractional knapsack problem is _____

Mark only one oval.

- Breaking items into fraction
- Adding items into knapsack
- Sorting
- Looping through sorted items

35. 27. Given items as {value,weight} pairs {{40,20},{30,10},{20,5}}. The capacity of knapsack=20. Find the maximum value output assuming items to be divisible.

Mark only one oval.

- 80
- 60
- 100
- 40

36. 28. What is the objective of the knapsack problem?

Mark only one oval.

- To get minimum total value in the knapsack
- To get maximum weight in the knapsack
- To get maximum total value in the knapsack
- To get minimum weight in the knapsack

37. 29. Fractional knapsack problem is also known as _____

Mark only one oval.

- 0/1 knapsack problem
- Divisible knapsack problem
- Continuous knapsack problem
- Non continuous knapsack problem

38. 30. Which bit is reserved as a parity bit in an ASCII set?

Mark only one oval.

- First
- Seventh
- Eighth
- Tenth

39. 31. What is the running time of the Huffman encoding algorithm?

Mark only one oval.

- O(C)
- O(log C)
- O(C log C)
- O(N log C)

40. 32. Recurrence equation formed for the tower of hanoi problem is given by _____

Mark only one oval.

- T(n) = 2T(n-1)+n
- T(n) = 2T(n/2)+c
- T(n) = 2T(n-1)+c
- T(n) = 2T(n/2)+n

41. 33. Recursive solution of tower of hanoi problem is an example of which of the following algorithm?

Mark only one oval.

- Dynamic programming
- Backtracking
- Divide and conquer
- Greedy algorithm

42. 34. Under what case of Master's theorem will the recurrence relation of merge sort fall?

Mark only one oval.

- 1
- 3
- 2
- It cannot be solved using master's theorem

43. 35. What is the condition for proper coloring of a graph?

Mark only one oval.

- ◯ two vertices having a common edge should always have same color
- ◯ all vertices should have a different color
- ◯ two vertices having a common edge should not have same color
- ◯ all vertices should have same color

44. 36. The number of colors used by a proper coloring graph is called?

Mark only one oval.

- ◯ x coloring graph
- ◯ m coloring graph
- ◯ k coloring graph
- ◯ n coloring graph

45. 37. What will be the chromatic number for an empty graph having n vertices?

Mark only one oval.

- ◯ 0
- ◯ 2
- ◯ 1
- ◯ n

46. 38. What will be the chromatic number for a line graph having n vertices?

Mark only one oval.

- 0
- 1
- n
- 2

47. 39. Which algorithm is used to solve a minimum cut algorithm?

Mark only one oval.

- Gale-Shapley algorithm
- Ford-Fulkerson algorithm
- Stoer-Wagner algorithm
- Prim's algorithm

48. 40. _____ separates a particular pair of vertices in a graph.

Mark only one oval.

- line
- arc
- cut
- flow

49. 41. _____ is a data structure used to collect a system of cuts for solving min-cut problem

Mark only one oval.

- Gomory-Hu graph
- Dancing tree
- Gomory-Hu tree
- AA tree

50. 42. Which algorithm is used to solve a maximum flow problem?

Mark only one oval.

- Prim's algorithm
- Kruskal's algorithm
- Ford-Fulkerson algorithm
- Dijkstra's algorithm

51. 43. The first step in the naïve greedy algorithm is?

Mark only one oval.

- calculating the maximum flow using trial and error
- adding flows with higher values
- Analyzing the zero flow
- reversing flow if required

52. 44. A simple acyclic path between source and sink which pass through only positive weighted edges is called?

Mark only one oval.

- residual path
- critical path
- Augmenting path
- maximum path

53. 45. Dijkstra's Algorithm is used to solve _____ problems.

Mark only one oval.

- All pair shortest path
- Network flow
- Single source shortest path
- Sorting

54. 46. Which of the following is the most commonly used data structure for implementing Dijkstra's Algorithm?

Mark only one oval.

- Max priority queue
- Stack
- Min priority queue
- Circular queue

55. 47. How many priority queue operations are involved in Dijkstra's Algorithm?

Mark only one oval.

- 1
- 2
- 3
- 4

56. 48. The maximum number of times the decrease key operation performed in Dijkstra's algorithm will be equal to _____

Mark only one oval.

- Total number of vertices
- Number of vertices – 1
- Total number of edges
- Number of edges – 1

57. 49. What is running time of Dijkstra's algorithm using Binary min- heap method?

Mark only one oval.

- O(V)
- O(VlogV)
- O(ElogV)
- O(E)

58. 50. Bellmann ford algorithm provides solution for _____ problems.

Mark only one oval.

- All pair shortest path
- Sorting
- Network flow
- quick sort

59. 51. What is the basic principle behind Bellmann Ford Algorithm?

Mark only one oval.

- Interpolation
- Extrapolation
- Relaxation
- Regression

60. 52. Bellmann Ford Algorithm is an example for _____

Mark only one oval.

- Greedy Algorithms
- Linear Programming
- Dynamic Programming
- Branch and Bound

61. 53. Floyd Warshall's Algorithm can be applied on _____

Mark only one oval.

- Undirected and unweighted graphs
- Undirected graphs
- Directed graphs
- Acyclic graphs

62. 54. Floyd Warshall Algorithm can be used for finding _____

Mark only one oval.

- Single source shortest path
- Topological sort
- Transitive closure
- Minimum spanning tree

63. 55. What procedure is being followed in Floyd Warshall Algorithm?

Mark only one oval.

- Top down
- Big bang
- Bottom up
- Sandwich

64. 56. The travelling salesman problem can be solved using _____

Mark only one oval.

- A spanning tree
- Bellman – Ford algorithm
- A minimum spanning tree
- DFS traversal

65. 57. Kruskal's algorithm is used to _____

Mark only one oval.

- find single source shortest path
- find all pair shortest path algorithm
- find minimum spanning tree
- traverse the graph

66. 58. When dynamic programming is applied to a problem, it takes far less time as compared to other methods that don't take advantage of overlapping sub problems.

Mark only one oval.

- True
- False
- All of these
- None of these

67. 59. Time Complexity of DFS is? (V – number of vertices, E – number of edges)

Mark only one oval.

- O(V + E)
- O(V)
- O(E)
- None of the mentioned

68. 60. A person wants to visit some places. He starts from a vertex and then wants to visit every vertex till it finishes from one vertex, backtracks and then explore other vertex from same vertex. What algorithm he should use?

Mark only one oval.

- Breadth First Search
- Trim's algorithm
- Depth First Search
- None of the mentioned

69. 61. Branch and bound is a _____

Mark only one oval.

- Data structure
- Sorting algorithm
- Problem solving technique
- Type of tree

70. 62. What will be the number of passes to sort the elements using insertion sort? 14, 12,16, 6, 3, 10

Mark only one oval.

- 6
- 7
- 5
- 1

71. 63. What is an in-place sorting algorithm?

Mark only one oval.

- The input is already sorted and in-place
- It requires additional storage
- It needs O(1) or O(logn) memory to create auxiliary locations
- None of the mentioned

72. 64. What is an external sorting algorithm?

Mark only one oval.

- Algorithm that uses main memory during the sort
- Algorithm that involves swapping
- Algorithm that uses tape or disk during the sort
- Algorithm that are considered ‘in place

73. 65. What is the time complexity of Dijikastra's algorithm

Mark only one oval.

- O(N)
- O(N)^3
- O(N)^2
- O(logN)

74. 66. What is the time complexity of the above dynamic programming implementation of the matrix chain problem?

Mark only one oval.

- O(1)
- O(n)
- O(n)^2
- O(n)^3

75. 67. Time complexity of fractional knapsack problem is _____

Mark only one oval.

- O(n log n)
- O(n)
- O(nW)
- O(n)^2

76. 68. How many bits are needed for standard encoding if the size of the character set is X?

Mark only one oval.

- log X
- X+1
- 2X
- X^2

77. 69. What is the running time of Bellmann Ford Algorithm?

Mark only one oval.

- O(V)
- O(V)^2
- O(ElogV)
- o(VE)

78. 70. How many passes does an insertion sort algorithm consist of?

Mark only one oval.

- N
- N+1
- N-1
- N^2