



BRAINWARE UNIVERSITY

Term End Examination 2021 - 22

Programme – Bachelor of Technology in Computer Science & Engineering

Course Name – Design and Analysis of Algorithm

Course Code - PCC-CS402

(Semester IV)

Time allotted : 1 Hrs.15 Min.

Full Marks : 60

[The figure in the margin indicates full marks.]

Group-A

(Multiple Choice Type Question)

1 x 60=60

Choose the correct alternative from the following :

- (1) Which of the following is/are property/properties of a dynamic programming problem?

a) Optimal substructure	b) Overlapping sub problems
c) Greedy approach	d) Both optimal substructure and overlapping sub problems
- (2) If a problem can be solved by combining optimal solutions to non-overlapping problems, the strategy is called _____

a) Dynamic programming	b) Greedy
c) Divide and conquer	d) Recursion
- (3) In dynamic programming, the technique of storing the previously calculated values is called _____

a) Saving value property	b) Storing value property
c) Memoization	d) Mapping
- (4) Which of the following problems is NOT solved using dynamic programming?

a) 0/1 knapsack problem	b) Matrix chain multiplication problem
c) Edit distance problem	d) Fractional knapsack problem
- (5) The 0/1 Knapsack problem is an example of _____

a) Greedy algorithm	b) 2D dynamic programming
c) 1D dynamic programming	d) Divide and conquer
- (6) Which of the following methods is efficient in solving Fractional Knapsack problem?

a) Brute force	b) Recursion
c) Dynamic programming	d) Greedy
- (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?

- a) 160
 - b) 200
 - c) 170
 - d) 90
- (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?
- a) 10 X 20
 - b) 20 X 30
 - c) 10 X 30
 - d) 10 X 20 X 30
- (9) Which of the problems cannot be solved by backtracking method?
- a) n-queen problem
 - b) Subset sum problem
 - c) Hamiltonian circuit problem
 - d) Travelling salesman problem
- (10) 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
- (11) What happens when the backtracking algorithm reaches a complete solution?
- a) It backtracks to the root
 - b) It continues searching for other possible solutions
 - c) It traverses from a different route
 - d) Recursively traverses through the same route
- (12) In what manner is a state-space tree for a backtracking algorithm constructed?
- a) Depth-first search
 - b) Breadth-first search
 - c) Twice around the tree
 - d) Nearest neighbor first
- (13) In general, backtracking can be used to solve?
- a) Numerical problems
 - b) Exhaustive search
 - c) Combinatorial problems
 - d) Graph coloring problems
- (14) Worst case complexity is equivalent to bound.
- a) upper
 - b) lower
 - c) tight
 - d) no
- (15) _____ enumerates a list of promising nodes that could be computed to give the possible solutions of a given problem.
- a) Exhaustive search
 - b) Brute force
 - c) Backtracking
 - d) Divide and conquer
- (16) 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
- (17) 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
- (18) For how many queens was the extended version of Eight Queen Puzzle applicable for n X n squares?
- a) 5
 - b) 6
 - c) 8
 - d) n

- a) 5
- b) 6
- c) 7
- d) 8

(32) How many number of moves are required to move N discs from one tower to another tower in Tower of Hanoi problem?

- a) $(2 \text{ to the power } N) - 1$
- b) $(2 \text{ to the power } N) + 1$
- c) $(2 \text{ to the power } N) / 1$
- d) $(N \text{ to the power } 2) - 1$

(33) What is the objective of tower of hanoi puzzle?

- a) To move all disks to some other rod by following rules
- b) To divide the disks equally among the three rods by following rules
- c) To move all disks to some other rod in random order
- d) To divide the disks equally among three rods in random order

(34) Recurrence equation formed for the tower of hanoi problem is given by _____

- a) $T(n) = 2T(n-1)+n$
- b) $T(n) = 2T(n/2)+c$
- c) $T(n) = 2T(n-1)+c$
- d) $T(n) = 2T(n/2)+n$

(35) Master's theorem is used for?

- a) Solving recurrences
- b) Solving iterative relations
- c) Analyzing loops
- d) Calculating the time complexity of any code

(36) How many cases are there under Master's theorem?

- a) 2
- b) 3
- c) 4
- d) 5

(37) In which case of master theorem can be solved by binary search?

- a) 1
- b) 2
- c) 3
- d) It cannot be solved using master's theorem

(38) What is the definition of graph according to graph theory?

- a) visual representation of data
- b) collection of vertices and edges
- c) collection of edges
- d) collection of vertices

(39) The number of colors used by a proper coloring graph is called?

- a) k coloring graph
- b) x coloring graph
- c) m coloring graph
- d) n coloring graph

(40) What is a chromatic number?

- a) The maximum number of colors required for proper edge coloring of graph
- b) The maximum number of colors required for proper vertex coloring of graph
- c) The minimum number of colors required for proper vertex coloring of graph
- d) The minimum number of colors required for proper edge coloring of graph

(41) What will be the chromatic number for an empty graph having n vertices?

- a) 0
- b) 1
- c) 2
- d) n

(42) What will be the chromatic number for a line graph having n vertices?

- a) 0
- b) 1
- c) 2
- d) n

(43) Which algorithm is used to solve a minimum cut algorithm?

- a) Gale-Shapley algorithm
- b) Ford-Fulkerson algorithm
- c) Stoer-Wagner algorithm
- d) Prim's algorithm

- (44) _____ separates a particular pair of vertices in a graph.
- a) line b) arc
c) cut d) flow
- (45) How many edges in a spanning tree of a graph with v vertices and E edges?
- a) $V-1$ b) $V+1$
c) $E-1$ d) $E+1$
- (46) Which of the following algorithm is/are used to find minimum spanning tree?
- a) Prim b) Kruskal
c) Prim and Kruskal d) None of these
- (47) Which of the following is/are methods to solve recurrence equations?
- a) substitution b) recursion tree
c) master method d) all of these
- (48) Does Ford- Fulkerson algorithm use the idea of?
- a) Naive greedy algorithm approach b) Residual graphs
c) Minimum cut d) Minimum spanning tree
- (49) Which of the following is/are parameter to check efficiency of an algorithm?
- a) time complexity b) space complexity
c) time and space complexity d) none of these
- (50) A simple acyclic path between source and sink which pass through only positive weighted edges is called?
- a) Augmenting path b) critical path
c) residual path d) maximum path
- (51) Dijkstra's Algorithm is used to solve _____ problems.
- a) All pair shortest path b) Single source shortest path
c) Network flow d) Sorting
- (52) Dijkstra's Algorithm cannot be applied on _____
- a) Directed and weighted graphs b) Graphs having negative weight function
c) Unweighted graphs d) Undirected and unweighted graphs
- (53) Which of the following is the correct recurrence equation of finding Fibonacci series using recursion?
- a) $T(n) = T(n-1) + T(n-2)$ b) $T(n) = T(n-1) - T(n-2)$
c) $T(n) = T(n-1) + T(n-1)$ d) $T(n) = T(n-2) + T(n-2)$
- (54) Sorting the edges in increasing order to find MST is a part of algorithm.
- a) Kruskal b) Prim
c) Dijkstra d) None of these
- (55) The Bellmann Ford algorithm returns _____ value.
- a) Boolean b) Integer
c) String d) Double
- (56) How many solution/solutions are available for a graph having negative weight cycle?
- a) One solution b) Two solutions
c) No solution d) Infinite solutions
- (57) What is the basic principle behind Bellmann Ford Algorithm?

- a) Interpolation
- b) Extrapolation
- c) Regression
- d) Relaxation

(58) A graph is said to have a negative weight cycle when?

- a) The graph has 1 negative weighted edge
- b) The graph has a cycle
- c) The total weight of the graph is negative
- d) The graph has 1 or more negative weighted edges

(59) Floyd Warshall's Algorithm can be applied on _____

- a) Undirected and unweighted graphs
- b) Undirected graphs
- c) Directed graphs
- d) Acyclic graphs

(60) What approach is being followed in Floyd Warshall Algorithm?

- a) Greedy technique
- b) Dynamic Programming
- c) Linear Programming
- d) Backtracking