

Design & Analysis of Algorithms

UNIT-II

Part – A (Short Answer Questions)

S.No.	Questions	BT	CO	PO
1	Describe Union operation on sets.	L3	CO1	PO2
2	Describe Find operation on sets.	L1	CO2	PO1
3	Define a spanning tree and minimal spanning tree.	L2	CO3	PO1
4	Define Graph in DAA.	L3	CO1	PO1
5	Define Tree in DAA.	L4	CO2	PO1
6	Differentiate Graph and Tree.	L5	CO2	PO2
7	What is a set? Write different types of set operations.	L3	CO3	PO1
8	Explain different types of UNION and FIND algorithms with example.	L1	CO1	PO2
9	What is a Disjoint Set? Give an example.	L3	CO1	PO1
10	Define connected and bi-connected components.	L2	CO2	PO2

Part – B (Long Answer Questions)

Q.No.	Question	BT	CO	PO
11(a)	What is Backtracking? Give the 4-Queens solution. Draw the portion of the state space tree for $n = 4$ queens using the backtracking algorithm.	L3	CO1	PO3
11(b)	What is a Hamiltonian Cycle? Explain how to find Hamiltonian path and cycle using the backtracking algorithm.	L2	CO2	PO2
12(a)	Give the statement of the Sum-of-Subsets problem. Find all subsets for $n = 4$, $(w_1, w_2, w_3, w_4) = (11, 13, 24, 7)$ and $M = 31$. Draw the portion of the state space tree using fixed-tuple size approach.	L4	CO1	PO3
12(b)	Define: (i) State Space Tree (ii) E-Node (iii) Dead Node.	L3	CO2	PO1
13(a)	Define Chromatic Number and give the state space tree for the 4-Coloring problem.	L1	CO1	PO2
13(b)	Explain the Graph Coloring problem. Draw the state space tree for $m = 3$ colors and $n = 4$ vertices graph. Discuss the time and space complexity.	L2	CO3	PO3
14(a)	Differentiate Divide and Conquer and Greedy Method.	L2	CO2	PO2
14(b)	Write an algorithm for the N-Queen's problem. Give time and space complexity for the 8-Queen's problem.	L3	CO1	PO3
15(a)	Distinguish between Dynamic Programming and Greedy Method.	L4	CO2	PO2



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15(b)	What is Graph in DAA? Give an example.	L1	CO3	PO1
16(a)	Explain the waiting rule for finding UNION of sets and the collapsing rule.	L2	CO2	PO2
16(b)	Explain with examples Find() and Union() algorithms.	L3	CO2	PO3