Code No: 155EV **R18**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year I Semester Examinations, January/February - 2023
DESIGN AND ANALYSIS OF ALGORITHMS
(Computer Science and Engineering - IOT)

Time: 3 Hours **Max. Marks: 75**

Note: i) Question paper consists of Part A, Part B.
ii) Part A is compulsory, which carries 25 marks. In Part A, Answer all questions.
iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART – A

(25 Marks)

1.a)	Define space complexity.	[2]
b)	Define Big O notation with an example.	[3]
c)	What is set?	[2]
d)	Give the principle of backtracking algorithm.	[3]
e)	What is Dynamic programming?	[2]
f)	List out applications of Dynamic programming.	[3]
g)	Define spanning tree.	[2]
h)	What is greedy algorithm?	[3]
i)	Define dead node.	[2]
j)	What is bounding function?	[3]

PART – B

(50 Marks)

2.a)	What is Divide and Conquer algorithm and write its applications.	
b)	Write an algorithm for binary search.	[5+5]
	OR	
3.a)	Explain merge sorting technique.	
b)	Sort 23 45 12 87 48 96 4 using merge sort algorithm.	[5+5]
4.a)	Explain Union algorithm on Disjoint set.	
b)	State n queen's problem and give a solution.	[5+5]
	OR	
5.a)	Describe sum sub sets problem with an example.	
b)	Give backtracking algorithm for sum of sub sets problem.	[5+5]
6.a)	Explain all pairs shortest path problem.	
b)	Using your own example, trace all pairs shortest path problem to find the shortest distances.	[5+5]
	OR	
7.a)	Explain steps to construct Optimal Binary Search Tree.	
b)	Solve reliability design problem using dynamic programming.	[5+5]

8.a) Explain general steps to construct greedy algorithm.
b) Solve job scheduling algorithm using greedy algorithm. [5+5]

OR

9. What is Prim's algorithm? Explain with example. Write down algorithm for it and derive its time complexity. [10]

10.a) Discuss least cost searching in detail.
b) Analyze the solution for travelling salesman problem using branch and bound. [5+5]

OR

11.a) Explain solution for knapsack problem using branch and bound algorithm.
b) State and Explain Cook's theorem. [5+5]

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