R13

Code No: 114CS

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B.Tech II Year II Semester Examinations, May - 2016

DESIGN AND ANALYSIS OF ALGORITHMS

(Computer Science and Engineering)

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

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A.
Part B consists of 5 Units. Answer any one full question from each unit.
Each question carries 10 marks and may have a, b, c as sub questions.

PART- A **(25 Marks)**

1.a)	List the asymptotic notations.	[2]
b)	Explain the time complexity of merge sort.	[3]
c)	Define graph.	[2]
d)	Explain the properties of strongly connected components.	[3]
e)	Give brief description on greedy method.	[2]
f)	What is multistage graph?	[3]
g)	Write the applications of Branch and Bound problem.	[2]
h)	What is sum of subsets problem?	[3]
i)	What is NP-Hard?	[2]
j)	Explain non-deterministic algorithm.	[3]

PART-B **(50 Marks)**

2.a)	What is an algorithm? Explain its characteristics.	
b)	Explain the strassen's matrix multiplication.	[5+5]
	OR	
3.a)	Discuss about space complexity in detail.	
b)	Write an algorithm for quick sort. Explain with an example.	[5+5]
4.a)	Describe Union and Find algorithms.	
b)	Explain the BFS algorithm with example.	[5+5]
	OR	
5.a)	Write a nonrecursive algorithm for preorder traversal of a binary tree T.	
b)	Explain game tree with an example.	[5+5]
6.a)	Write a greedy algorithm to the job sequencing with deadlines.	
b)	Define merging and purging rules in 0/1 knapsack problem.	[5+5]
	OR	
7.a)	Differentiate between greedy method and dynamic programming.	
b)	Explain the Kruskal's algorithm with an example.	[5+5]
8.	Draw the portion of the state space tree generated by LCBB for the following instances: n=5, m=12, $(P_1 \ldots P_5) = (10, 15, 6, 8, 4)$ $(w_1 \ldots w_5) = (4, 6, 3, 4, 2)$	[10]
	OR	
9.a)	Describe Backtracking technique to m-coloring graph.	
b)	Briefly explain n-queen problem using backtracking.	[5+5]

10.a) Explain the classes of NP-Hard and NP-Complete.

b) Explain the satisfiability problem. [5+5]

OR

11.a) Explain the strategy to prove that a problem is NP hard.

b) Explain the non-deterministic sorting problem. [5+5]

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