Code No: 114CS **R13**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech II Year II Semester Examinations, May - 2019
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) Explain the Big oh notation. [2]
b) Explain Binary search in brief. [3]
c) What are disjoint sets? [2]
d) What is spanning tree? [3]
e) State the travelling salesman problem. [2]
f) Write the applications of Dynamic programming. [3]
g) What is Hamiltonian cycle? [2]
h) Explain 8-queen problem. [3]
i) What is NP-Complete? [2]
j) Explain non-deterministic algorithm. [3]

PART-B **(50 Marks)**

2.a) Describe the performance analysis of an algorithm in detail.
b) Briefly explain merge sort algorithm with suitable example and derive its time complexity. [5+5]

OR

3.a) Define time complexity. Describe different notations used to represent time complexities.
b) Explain divide and conquer in detail. [5+5]

4.a) Write a nonrecursive algorithm for inorder traversal of a binary tree T.
b) Explain AND/OR Graphs. [5+5]

OR

5. Explain in detail about:
a) Depth First Search
b) Breadth First Search. [5+5]

6.a) Explain Optimal binary search tree.
b) Explain the Prim's algorithm with an example. [5+5]

OR

7.a) Solve the following 0/1 Knapsack problem where P=(10, 5, 15, 7, 6, 18, 3), W=(2, 3, 5, 7, 1, 4, 1), C=15, n=7.
b) Write an algorithm of all pairs shortest path problem. [5+5]

8.a) Explain in detail about backtracking.
b) Explain the graph coloring with example. [5+5]

OR

9.a) Briefly explain the Hamiltonian cycle using backtracking.
b) Explain the FIFO Branch and Bound solution. [5+5]

10.a) Compare and contrast between NP-Hard and NP Complete.
b) Briefly explain Cooks theorem. [5+5]

OR

11.a) Explain the classes of P and NP.
b) Write a non-deterministic Knapsack algorithm. [5+5]

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