Code No: 114CS **R13**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B.Tech II Year II Semester Examinations, April - 2018
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) What is Amortized complexity ? [2]
b) Write down the importance of Space complexity. [3]
c) Define spanning tree. [2]
d) Mention the types of Binary tree traversal. [3]
e) Define Job sequencing with deadlines. [2]
f) What do you mean by Multistage Graphs? [3]
g) What is Hamiltonian Cycles? [2]
h) Specify the uses of Graph coloring techniques. [3]
i) Define NP hard problem. [2]
j) Write about Node cover decision problem. [3]

PART-B

(50 Marks)

2.a) Define sorting.
b) Illustrate on Strassen's Matrix Multiplication.
c) Specify how the merge sort takes place? [2+4+4]

OR

3.a) Enumerate on Asymptotic Notations in detail.
b) Explain about Probabilistic analysis of an algorithm.
c) Explain the working principles of divide and conquer method. [4+4+2]

4.a) Explain about the union and find algorithms in detail.
b) Give the algorithm of Breadth first search tree traversal.
c) List out the differences between connected components and Bi connected components. [4+4+2]

OR

5.a) Explain about AND/OR graphs in detail.
b) Define tree.
c) What do you mean by game trees? Explain. [4+2+4]

6.a) Define Graph.
b) Brief about Single source shortest path.
c) Enumerate on optimal binary search trees. [2+4+4]

OR

7.a) What do you mean by Reliability design?
b) Explain in detail about all pair shortest problem.
c) Give an algorithm of 0/1 Knapsack problem of dynamic programming. [2+4+4]

8.a) Explain the General Backtracking method in detail.
b) State and prove sum of subsets problem. [5+5]

OR

9.a) Explain about Graph coloring in detail.
b) Illustrate on FIFO Branch and Bound solution.
c) Define Recursive method. [4+4+2]

10.a) Define Non deterministic algorithm.
b) Write down the nondeterministic clique pseudocode.
c) Give six sub formulas for assertions in cook's theorem. [2+4+4]

OR

11.a) Write down the nondeterministic search algorithm.
b) How the nondeterministic algorithm supports Maximum clique? Explain.
c) How to attain satisfiability in Nondeterministic algorithms? [4+4+2]

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