R09

Code No: 54016

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B.Tech II Year II Semester Examinations, November/December - 2015

DESIGN AND ANALYSIS OF ALGORITHMS

(Common to CSE, IT)

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

Answer any five questions

All questions carry equal marks

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1. Elaborate on what are asymptotic notations with examples. [15]

2. What are connected and biconnected components. Explain. [15]

3. What is divide and conquer strategy and explain how it is applied for sorting the elements using quick sort. Derive the average case complexity of quick sort. [15]

4. What is a spanning tree? Compare and write algorithm for computing the spanning tree for a graph using Prim's and Kruskal's method. [15]

5.a) Write and explain the algorithm for all pairs shortest path problem.

b) Consider a three stage system with $r_1=0.3$, $r_2=0.5$, $r_3=0.2$ and $c_1=30$, $c_2=20$, $c_3=30$. The total cost of the system is $c=80$ and $u_1=2$, $u_2=3$, $u_3=2$. Find the reliable design of the system. [7+8]

6.a) Write an algorithm of finding all m-colorings of a graph.

b) Describe the 4-queens problem using backtracking. [7+8]

7.a) Generate FIFO branch and bound on the travelling sales man problem and find the solution space tree.

b) What is bounding. Explain the principles of bounding. [8+7]

8. State and explain Cook's theorem and also explain NP complete classes. [15]

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