Code No: A5801 **NR**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
M.Tech I Semester Examinations, April/May 2012
DESIGN AND ANALYSIS OF ALGORITHMS
(COMPUTER SCIENCE AND ENGINEERING)

Time: 3hours **Max. Marks: 60**

Answer any five questions
All questions carry equal marks
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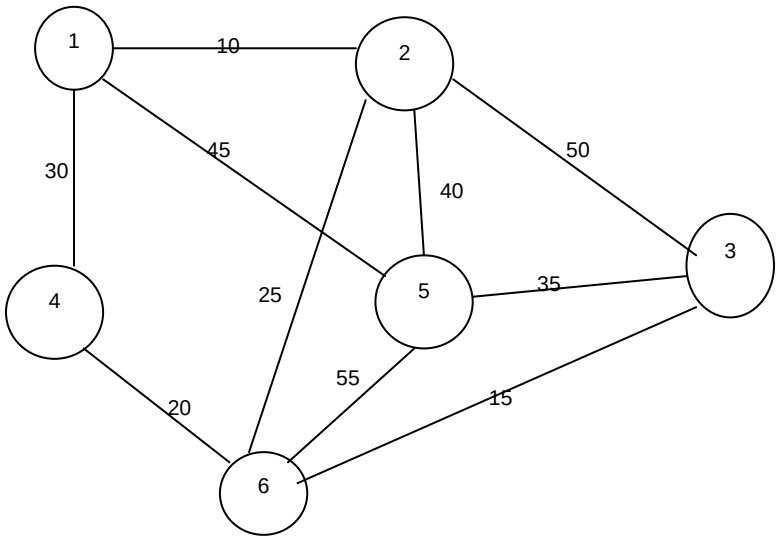
1.a) Briefly explain about function overloading with example.
b) Define exception. Briefly explain about Exception handling mechanism with example.

2.a) Define the terms "Time complexity" and "Space complexity" of algorithms. Give a notation for expressing such a complexity and explain the features of such a notation.
b) Explain the usefulness of the following functional operations on sets.
I. MIN II. DELETE III. FIND IV. UNION V. INSERT

3. Briefly explain the Quick Sort Algorithm with suitable example and derive its worst case, best case and average case time complexities.

4. Write and explain the Prim's algorithm. Applying the algorithm construct a minimal spanning tree for graph given bellow.



5.a) Define Optimal Binary Search Tree. Briefly explain the functions of OBST.
b) Use function OBST to compute w(i,j),r(i,j) and c(i,j), 0<=i<j<=4, for the identifier set (a1, a2, a3, a4)=(count, float, if, while) with p(1)=1/20, p(2)=1/5 p(3)=1/10, p(4)=1/20, q(0)=1/5, q(1)=1/10, q(2)=1/5, q(3)=1/20, and q(4)=1/20. Using the r(i,j)'s, construct the Optimal Binary Search Tree.

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6. Briefly explain about
   a) Game Trees
   b) AVL Trees

7.a) Explain the method of reduction to solve TSP problem using Branch and Bound.
  b) Explain the principles of FIFO Branch and Bound.

8.a) Explain about Cook's theorem.
  b) Write a nondeterministic Knapsack algorithm.

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