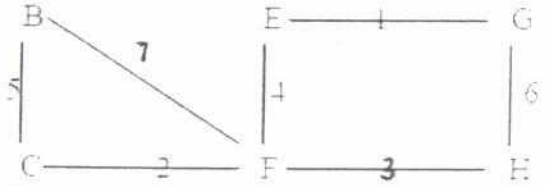
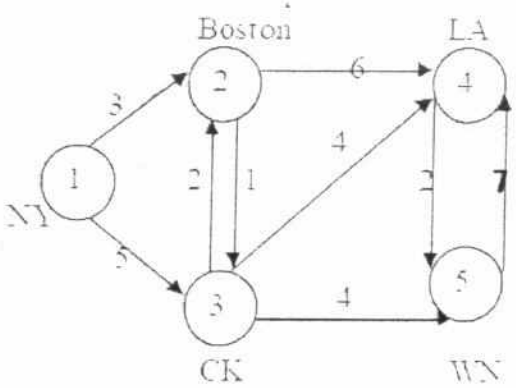
Roll Number:_____

Thapar University, Patiala

Department of Computer Science and Engineering

Special Auxiliary Exam B. E. COE (Second Year): Semester-IV	Course Code: UCS406 Course Name: Data Structures and ALgorithms
August 23, 2017	Time: 17.30 – 20.30 Hrs
Time: 3 Hours, M. Marks: 100	Name of Faculty: Tarunpreet Bhatia

Note: ***All questions are compulsory and attempt all parts of a question at one place. Assume missing data, if any, suitably.***

Q.1	Explain Binary Search Tree and various operations for BST.	(15)
Q.2	Explain divide and conquer approach and discuss it with the Merge sort on a given array with 9 elements as 77,33,44,11,88,22,66,55,99	(10)
Q.3	Consider a hash table of size M = 10. If items with keys k = 89; 18; 49; 58; 69; 64; 70; 45;4 are inserted in that order, draw the resulting hash table if we resolve collisions using Linear probing with h(k) = k mod 10.	(10)
Q.4	Explain with example how will you add an element Q and delete an element Q, assuming the queue is represented as circular queue.	(10)
Q.5	Indicate the order in which Kruskal's algorithm would include edges in constructing a minimum spanning tree for the following graph: 	(10)
Q.6	Apply Dijkstra's algorithm on the following weighted graph to find shortest path of all the nodes from source node 'NY'. 	(15)
Q.7	You are given n=9. The execution time of each job is one unit of time. We can execute one job at a time. (i) Each job Ji has profit Pi and deadline Di (ii) You will get Pi if you complete Ji with Deadline Di	(10)

Jobs	J1	J2	J3	J4	J5	J6	J7	J8	J9
Profit	15	20	30	18	18	10	23	16	25
Deadline	7	2	5	3	4	5	2	7	3

Find out the jobs which are left out and What is maximum profit we are getting?

Q.8	Differentiate between: (i) DFS and BFS (ii) Stack and Queue (iii) Graph and Tree (iv) Greedy and Dynamic Programming	(4*5=20)