B.Tech. SEM -IV Info. Tech. 2014 Course (CBCS) : SUMMER - 2019

SUBJECT: ADVANCED DATA STRUCTURE

Day: Saturday
Date: 25/05/2019

S-2019-2618

Time: 10.00 AM TO 01.00 PM
Max. Marks: 60

N.B:

1) All questions are **COMPULSORY**.
2) Figures to the right indicate **FULL** marks.
3) Draw neat and labeled diagrams **WHEREVER** necessary.

Q.1 Describe the factors to be considered for analysis of algorithm. Elaborate best, average and worst case complexity with suitable example. **(10)**

OR

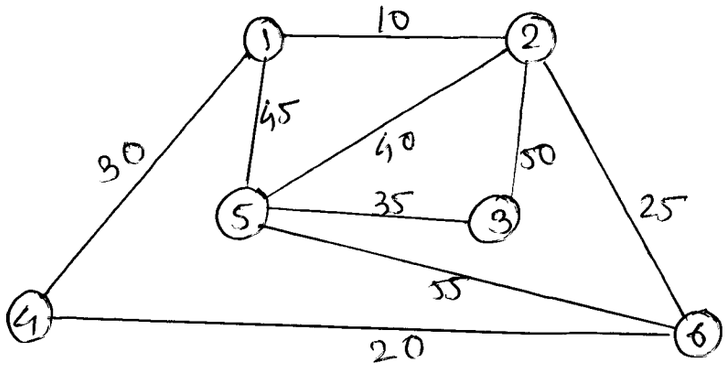
Q.1 Write 'C' function for finding factorial of a number using recursion. Analyze the same for it's time complexity. **(10)**

Q.2 State the properties of B tree. **(10)**
Construct B tree of order 3 for following data:
50, 30, 21, 90, 10, 13, 20, 70, 25, 92, 80
After complete formation of tree, delete the node 70 and 13.

OR

Q.2 Define Red-Black tree and state its properties. Explain the algorithm of insertion in Red-Black tree with the help of suitable example. **(10)**

Q.3 Construct minimum cost spanning tree using Krushkal's algorithm. Also find it's cost with all intermediate steps. **(10)**



OR

Q.3 What is Directed Acyclic graph? Write algorithm steps for topological sort with example. Also, Enlist the applications of topological sort. **(10)**

P.T.O.

Q.4 Explain Rabin-Karp algorithm. What is the hash function used to calculate values for character sequences in Rabin-Karp Algorithm? Isn't it time consuming to hash every one of the M- Character sequence in the text body? **(10)**

OR

Q.4 Explain Knuth-Morris-Pratt (KMP) string searching algorithm with graphical presentation. How it differs from Brute Force algorithm? **(10)**

Q.5 What is Heap? Explain how Priority Queue can be realized using Heap. **(10)**

OR

Q.5 What is External Sorting? Explain K-Way Merge sorting with suitable example. **(10)**

Q.6 Show that greedy strategy will not work for 0-1 knapsack problem. Give dynamic programming based solution for this problem. **(10)**

OR

Q.6 For a directed graph the edge length matrix is given below. Solve travelling salesman problem, for this 4 city graph using dynamic programming method. What will be the time complexity for n city travelling salesman problem solved using this? **(10)**

	1	2	3	4
1	0	9	8	8
2	12	0	13	6
3	10	9	0	5
4	20	15	10	0

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