

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 (10)
best, average and worst case complexity with suitable example.

OR

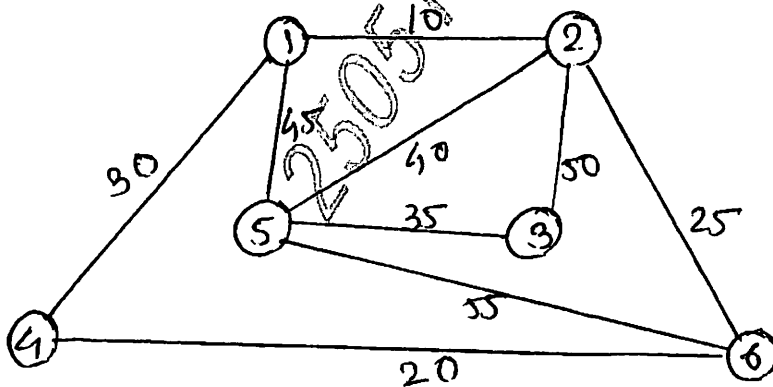
Q.1 Write 'C' function for finding factorial of a number using recursion. Analyze (10)
the same for it's time complexity.

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 (10)
insertion in Red-Black tree with the help of suitable example.

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



OR

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

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

25057977-engg@uine

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