Roll No. .....

B.Tech. (CO]

## SUPPLIMENTRY EXAMINATION

AUG-2018

## CO-214 ALGORITHM DESIGN AND ANALYSIS

(Old Scheme)

Time: 3:00 Hours

Max. Marks: 70

Note: Attempt any 5 questions. All questions carry equal marks.

Assume suitable missing data, if any.

Q1. (a) For each of the following recurrence sole them with the help of master theorem? [4X2=8]

(i) 
$$T(n) = T\left(\frac{3n}{4}\right) + n$$

(ii) 
$$T(n) = 4T\left(\frac{n}{2}\right) + n\log n$$

(b) Solve T (n) =  $2T(\frac{n}{2}) + n$  with the help of recursion tree method. Show each and every step involved. [6 marks]

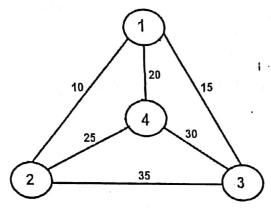
Q2. (a) Write the quick sort algorithm. Analyze its efficiency. Apply the algorithm to sort the list { 4, 1, 6, 3, 9, 2, 7, 5} [7 marks]

(b) Solve following 0/1 Knapsack problem using dynamic programming for Knapsack capacity W=5.

Item no.	weight	Value
1	2	12
2	1	10
3	3	20
4	2	15

[7 marks]

(b) Solve travelling salesman by applying branch and bound for the given graph?

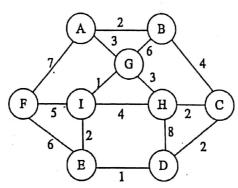


[7 marks]

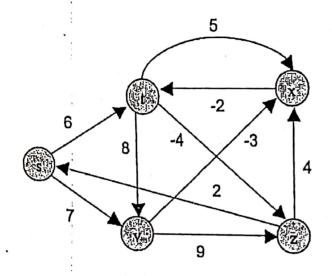
Q4. (a) Explain the different types of hashing. For the input 30,20,56,75,31,19 and hash function  $h(K) = 2K \mod 11$ , construct the open hash table. [7 marks]

(b) Explain concept of Approximation algorithms. Write approximation algorithm for NP-Hard problem. [7 marks]

Q5 (a) Write down Dijkstra algorithm. Show step by step implementation of the same algorithm on the given graph with node A as the source node.



(b) Write down Bellman ford algorithm. Show step by stem implementation of the same algorithm on the given graph using vertex z as source vertex.



[7 marks]

Q6. Write short notes on

[7x2=14]

- (i) P and NP class
- (ii) NP-Hard problems
- (iii) Reducibility
- (iv) Big-oh
- (v) Stable sorting
- (vi) Master's Theorem
- (vii) Vertex Cover Problem