

END TERM EXAMINATION

FOURTH SEMESTER [B.TECH] MAY-JUNE 2017

Paper Code: ETCS-204

Subject: Algorithm Analysis and Design

Time: 3 Hours

Maximum Marks: 75

Note: Attempt any five questions including Q no.1 which is compulsory.

- Q1 Answer following in brief:- (5x5=25)
- (a) Illustrate the steps involved in analyzing algorithm using an example.
 - (b) Explain a sorting algorithm that use divide and conquer method.
 - (c) Write the Kruskal's algorithm for minimum spanning tree.
 - (d) Solve the recurrence relation, where $T(1)=1$ and $T(n)$ for $n \geq 2$ satisfies $T(n)=3T(n/2)+n$.
 - (e) Write a short note on string matching algorithms.

- Q2
- (a) Drive the time complexity of quick sort algorithm for Best, Average and Worst Case. Explain which case is useful and why? (6.5)
 - (b) Explain various asymptotic methods used to represent the rate of growth of running time of algorithms. (6)

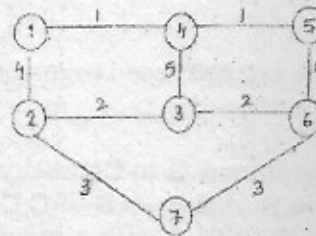
- Q3
- (a) Write an algorithm to search an item in a linear list in the minimum possible time. If there are n nodes in the list, what is the running time of your algorithm? (6.5)
 - (b) Suggest an approximation algorithm for traveling sales person problems using Minimum spanning tree algorithm. (6)

- Q4
- (a) Explain the Floyd Warshall algorithm with example. (6)
 - (b) Solve the following knapsack problem using the Dynamic Programming.

W	10	20	30	40	50
V	20	30	66	40	60

Weighting carrying capacity of the knapsack(W) is 100 and Number of object (n) is 5. (6.5)

- Q5 (a) Find the minimum spanning tree for the graph shown below using prim's algorithm. (6.5)



- (b) Explain Matrix Chain Multiplication Algorithm in detail. (6)
- Q6
- (a) Differentiate between Dynamic and Greedy methodology. (6)
 - (b) Explain characteristics of Greedy algorithm. Greedy techniques always find optimal solution. State True/False. Also justify. (6.5)
- Q7
- (a) Enlist all string matching algorithms and compare them on the basis of their storage requirement and time complexity. (6)
 - (b) Explain Rabin- karp algorithm to solve the string matching problem. (6.5)
- Q8
- (a) Define and explain P, NP, NP hard and NP complete problems. (6.5)
 - (b) What is reducibility? Explain with example. (6)
