Exam.Code:0916
Sub. Code: 6781

1058

B.E. (Computer Science and Engineering)
Fourth Semester
CS-401/411: Analysis and Design of Algorithms

Time allowed: 3 Hours **Max. Marks**: 50

NOTE: *Attempt five questions in all, including Question No. I which is compulsory and selecting two questions from each Unit.*

x-x-x

I. Attempt the following:-

a) Define time complexity of an algorithm.

b) Give recurrence equation for Mergesort.

c) Write the best and worst case complexity of selection sort.

d) Give the number of matrix multiplications, additions and subtractions required in Strassen Matrix Multiplication

e) State the greedy approach in Kruskal.

f) State the difference between greedy method and dynamic programming

g) Give the time complexity for all pairs shortest path problem.

h) Explain the term reducibility

i) What is chromatic number of graph?

j) What is backtracking? (10x1)

UNIT – I

II. Give the solution for recurrences with Master Method
a) $T(n)=9T(n/3)+n$
b) $T(n)=3T(n/4)+ n \lg n$ **(10)**

III. Write a non-recursive algorithm to sort numbers using Quick sort. **(10)**

IV. Find optimal solution for a Knapsack with capacity 15. There are 7 objects. The profit and weight tuple for the objects are (10,5,15,7,6,18,3) and (2,3,5,7,1,4,1) respectively. **(10)**

UNIT – II

V. Write the algorithm for Multistage graph using forward approach. (10)

VI. Write an algorithm for N Queen problem. (10)

VII. Write a short note on NP complete problems. (10)

x-x-x