

SUBJECT CODE NO:- P-297
FACULTY OF ENGINEERING AND TECHNOLOGY
T.E.(CSE/IT) Examination MAY/JUNE-2016
Design & Analysis of Algorithms
(Revised)

[Time: Three Hours]

[Max Marks:80]

“Please check whether you have got the right question paper.”

N.B

- i) Q.No.1 from section A and Q.No.6 from section B are compulsory.
 ii) Attempt any two questions from the remaining questions in each section.

Section A

- Q.1 Attempt any five. 10
 a) Write characteristics of an algorithm
 b) Explain any 2 algorithm design method
 c) How is an algorithm time efficiency measured
 d) Define feasible and optimal solution.
 e) Write any two characteristics of greedy method
 f) Write an iterative function to find sum of 'n' numbers
 g) Explain space complexity
- Q.2 a) Explain binary search method using divide & conquer technique. 08
 b) Sort the following data using quick sort = {30,20,25,10,15,35,25,40} 07
- Q.3 a) Explain heap sort with an example 08
 b) Find an optimal placement for 13 programs on three tapes T_0 , T_1 & T_2 where the programs are of lengths {12,5,8,32,7,5,18,26,4,3,11,10,6} 07
- Q.4 a) Explain optimal merge patterns 07
 b) Explain Strassen's matrix multiplications 08
- Q.5 a) Write an algorithm to find smallest & largest number in an array 08
 b) Explain Huffman coding with suitable example 07

Section B

- Q.6 Attempt any five 10
 a) Explain difference between GM & DP
 b) Define multistage graph
 c) Define implicit & explain constraints
 d) What is branch & bound method
 e) Define chromatic number of a graph
 f) State sum of subsets problem
 g) Explain least count search
- Q.7 a) Determine optimal binary search tree for $n=4$, $(a_1, a_2, a_3, a_4) = (\text{do, if, int, while})$ $P(1:4) = (3, 3, 1, 1)$ 10
 $q(0:4) = (2, 3, 1, 1, 1)$
 b) Write an algorithm for all pairs shortest path problem 05
- Q.8 a) Solve sum of subset problems using back tracking for $n = 4$ $(w_1, w_2, w_3, w_4) = (11, 13, 24, 7)$ & $m = 31$ 08
 b) Explain connected & biconnected components in a graph 07

- Q.9 a) Write an algorithm for tree traversal methods. 06
b) Solve 4-Queen's problems using FIFO branch & bound. 09
- Q.10a) Solve 1S- puzzle problem using branch & bound. Initial arrangement is: 09
- $$\begin{bmatrix} 1 & 2 & 3 & 4 \\ 5 & 6 & & 8 \\ 9 & 10 & 7 & 11 \\ 13 & 14 & 15 & 12 \end{bmatrix}$$
- b) Explain graph coloring problem and its application 06