Code: IT5T2

### III B.Tech - I Semester – Regular/Supplementary Examinations
### October 2018

# DESIGN METHODS AND ANALYSIS OF ALGORITHMS
### (INFORMATION TECHNOLOGY)

Duration: 3 hours                                   Max. Marks: 70

### PART – A
Answer *all* the questions.   All questions carry equal marks

$$11x\ 2 = 22\ M$$

1. a) Define about Theta-notation.

b) List out basic Efficiency Classes.

c) What is Brute Force String Matching?

d) Define 0/1 Knapsack problem.

e) What is general method of Divide-and-conquer?

f) Give the application of Horner's rule.

g) Define Greedy technique.

h) How is prim's minimum cost spanning tree different from krushkal cost spanning tree?

i) State Back Tracking.

j) State 8-queens problem.

k) Describe Hamiltonian cycle.

## PART – B

Answer any **THREE** questions.   All questions carry equal
marks.                                                         3 x 16 = 48 M

2. a) Explain time complexity methods with a suitable
   example.                                                    8 M

   b) Explain the steps involved in design and analysis of
   algorithms.                                                 8 M

3. a) Sort the list E, X, A, M, P, L, E in alphabetical order by
   selection sort.                                             8 M

   b) Outline an exhaustive – search algorithm for the
   Hamiltonian Circuit Problem.                                8 M

4. a) Explain the strategy for Stassen matrix multiplication with
   an example.                                                 8 M

   b) Sort the following elements using Merge Sort
   45, 22, 88, 23, 78, 46, 44, 21, 34.                         8 M

5. a) Find out the most feasible solution using dynamic
   programming method for the knapsack, Whose size n=5
   which has to be filled with 5 objects whose weights and
   profits are
   W=(23,14,36,78,3)     P=(20,40,45,12,60)   with the bag
   capacity 35  ?                                              8 M

b) Describe Krushkal's spanning tree generation with an
   example.                                                8 M

6. a) Draw and explain the portion of the state space tree for
      4-queens problem that is generated during back tracking.
                                                           8 M

   b)  i) Write short notes on NP Complete problems.
       ii) Explain Branch and Bound Technique with help of an
          algorithm.                                       8 M