Code: IT5T2

III B.Tech - I Semester – Regular/Supplementary Examinations October 2017

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) What are the fundamentals of Algorithmic problem solving?
   b) Compare exact and approximate problem solving.
   c) Write an algorithm for sequential search.
   d) How brute force technique is applied on Assignment problem.
   e) Illustrate Binary Search problem with example.
   f) Write a short notes on Josephus problem.
   g) What are the elements of Dynamic Programming?
   h) List out the types of knapsack problem with its time complexities.
   i) Draw a decision tree for 3-element insertion sort.
   j) Explain branch and bound technique.
   k) Compare decrease and conquer & transform and conquer.

PART – B

Answer any ***THREE*** questions. All questions carry equal marks.

$$3 \text{ x } 16 = 48 \text{ M}$$

2. a) Compare any 3 asymptotic techniques.   8 M

   b) Illustrate with a neat sketch the steps of algorithmic
      problem solving.   8 M

3. a) Write Brute-Force String Matching with suitable example.
                       8 M

   b) Write algorithm for Binary Search with Time Complexity
      and illustrate with an example.   8 M

4. a) What is Horner's rule? Write an algorithm for evaluating
      polynomial using horner's rule and apply horner's rule to
      evaluate the polynomial $p(x)=3x^5+2x^4-5x^3+x^2+7$ at x=3.
                       10 M

   b) Compare Merge and Quick sorting techniques.   6 M

5. a) Write an algorithm for Huffman encoding with an example.
                       8 M

   b) Write an algorithm for insertion and deletion of a node in
      a BST.   8 M

6. Write a back tracking algorithm for 8 queen's problem.
   Illustrate with an example.   16 M