RGPVONLINE.COM

Roll No ....

MCTA - 102

M.E./M. Tech., I Semester

Examination, June 2014

Programming System

Time : Three Hours

Max. Marks : 70

Note: i) Attempt any five questions.
    ii) All questions carry equal marks.

1. a) A binary tree has a nodes. The inorder and preorder traversals of the tree yield the following sequence of nodes. Draw the tree and explain the algorithm.
Inorder: E A C K F H D B G
Preorder: F A E K C D H G B
    7

   b) What is hashing? What are different methods of hashing? Explain with example.   7

2. a) How the polynomial is represented through liner link list? Explain with example.   7

   b) What is a priority queue? Write an algorithm to perform insertion and deletion operation on circular queue.   7

3. a) Solve the recurrence   7

   i) $T(n)=T\left(\dfrac{n}{3}\right)+T\left(\dfrac{2n}{3}\right)+O(n)+\ldots\ldots\ldots\ldots$

   ii) $T(n)=2T\left(\dfrac{n}{2}\right)+C\quad T(1)=1$

---

   b) What are Asymptotic Notations? Explain each relation with example and diagram.   7

4. a) Explain the factors which are required to compute the performance measure of any algorithm.   7

   b) Solve the following list using merge sort:
   70, 20, 30, 40, 10, 50, 60.   7

5. a) Define how knapsack problem is solved by using dynamic programming approach? Consider
$n=3, (w_1, w_2, w_3) = (2, 3, 3), (p_1, p_2, p_3) = (1, 2, 4)$ and $M=6$
Find optimal solution for the given data.   7

   b) Explain branch and bound. Differentiate between backtracking and branch and bound method. How can travelling salesman problem be solved using branch and bound?   7

6. a) Write DFS algorithm and calculate the running time of it.   7

   b) Write short note on :   7
    i) String processing algorithm
    ii) Algebraic algorithms

7. a) Explain the classes of NP hard and HP complete.   7
   b) Show that hamiltonian path problem is NP complete.   7

8. Write short notes: 14
   i) Approximation algorithm
   ii) Set Algorithm
   iii) Combinatorial algorithm

****** RGPVONLINE.COM