Total No. of Questions : 8] *[Total No. of Printed Pages : 2*

Roll No .....

MCTA-102

M.E/M.Tech., I Semester

Examination, December 2016

Programming System

Time : Three Hours

Maximum Marks : 70

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

1. a) Suppose a queue is maintained by a circular array QUEUE with N = 12 memory cells. Find the number of elements and positions of FRONT and REAR in QUEUE if FRONT=9 and REAR = 5 and then four elements are deleted. Show the QUEUE? 7
   b) Simulate using stack to convert the infix expression to postfix expression. 7
   B * (A + D) / E – F * (G + H/K)

2. a) Discuss with example how to analysis a algorithms? 7
   b) Calculate time complexity of the following code 7

```
For (i = 1; i ≤ n: i ++)
    {
    For (J = 1: j ≤ n: j++
       {
          sum = sum + 1;
       }
    }
```


3. a) Explain implicit and explicit constraints. 7
   b) Explain back-tracking algorithm. Apply the same to solve the following instance of the subset-sum problem
   S = {3, 5, 6, 7} and d = 15. 7

4. a) Discuss the concept of approximation algorithms. With example? 7
   b) Explain following term : 7
      i) Algebraic algorithms
      ii) Set algorithms

5. Briefly explain the concept of P, NP, NP-Hard and NP complete problem? 14

6. a) Construct a binary tree whose inorder and postorder traversals are as follows 7
   Inorder : D, B, A, E, C, G, F, H
   Postorder : D, B, E, G, H, F, C, A
   b) What is complexity of an algorithm? How do you determine the complexity of an algorithm? 7

7. a) Explain travelling sales man problem. 7
   b) Explain Huffman codes and priority queues. 7

8. Write a short notes (any two) : 2×7=14
   a) Nondeterministic polynomial algorithm
   b) External sorting
   c) Hard problem

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