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

Roll No .....

MEDC - 201

M.E./M.Tech. II Semester

Examination, December 2014

System Programming

Time : Three Hours

Maximum Marks : 70

Note: 1. Attempt any five questions out of eight questions.
2. Assume any data if required.

1. a) What are the different steps in problem solving with digital computer algorithm.
   b) Explain the terms:
      i) Impure procedure
      ii) Pure procedure

2. a) Enlist and explain the data structures used in pass - 1 and pass - 2 of direct linking loader.
   b) Explain the structure of Macro Definition Table (MDT) and Argument List Array (ALA) with the help of example.

3. a) What are the properties of a B-tree? Write a program to insert a new vertex into a 2-3 tree, Assuming that the levels are ordered. Draw the 2-3 tree the following, each insertion of the keys 20, 40, 30, 10, 25, 28, 27, 37, 32, 36 and 2, 3 in order.
   b) What is heap short strategy? Prove that heap sort requires $O(n \log n)$ time. Also explain storage compaction procedure.

4. a) Explain the linked list. Also explain the concept single linked list and doubly linked list.
   b) What do you mean by sorting? Mention the different type of sorting give some example. Compare the advantage and disadvantage of bubble, insertion, and selection sort.

5. a) Distinguish between linear and binary search methods. Also write an algorithm for non-recursive binary search method?
   b) Write down counting sort algorithm. Illustrate the operation of counting sort on the following array
   A = {7, 1, 3, 1, 2, 4, 5, 7, 2, 4, 3}

6. a) Deduce a recursive definition for finding the minimum cost of matrix-chain multiplication problem. Find the optimal parenthesization of a matrix chain product <5*10, 10*3, 3*12, 12*5, 5*50, 50*6>
   b) Explain the terms of following:
   Assembler, interpreter, compiler

7. a) Explain the different phases of compilers. Compare the assembler, Interpreter, and compiler.
   b) What kinds of source program errors would be detected during code generation. Compare global and local optimization.

8. a) Compare use of binary search organization and binary tree organization for constructing symbol table in a language processor.
   b) Write short on following
      i) Editor
      ii) AVL tree
      iii) Static and dynamic allocation
      iv) Pointer for data structure

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