Total No. of Questions : 5] *[Total No. of Printed Pages : 2*

Roll No .....

EI/IC - 302

B.E. III Semester

Examination, December 2016

Data Structures and Algorithms

Time : Three Hours

Maximum Marks : 70

Note: i) Answer five questions. In each question part A, B, C is compulsory and D part has internal choice.
ii) All parts of each question are to be attempted at one place.
iii) All questions carry equal marks, out of which part A and B (Max. 50 words) carry 2 marks, part C (Max. 100 words) carry 3 marks, part D (Max. 400 words) carry 7 marks.
iv) Except numericals, Derivation, Design and Drawing etc.

Unit - I

1. a) What is structural programming?
   b) What are the abstract data types?
   c) What do you mean by pointers? Explain with suitable examples.
   d) What is traversing? Write the algorithm for traversing the linear array.

   OR

   Consider a 2D array declared in "C" language A[20][30]. Element type is integer. If the base address is 1076, what will be the address of A[17][29] memory is byte oriented.

Unit - II

2. a) What is stack?
   b) Describe circular linked list.
   c) What causes underflow of stack? How it could be avoided?
   d) Define an efficient representation of two stack in a given area of memory with *n* words and explain.

   OR

   Write an algorithm to insert a node into a linked list.

Unit - III

3. a) What is binary tree?
   b) Define hasting.
   c) Define extended binary tree?
   d) Construct an expression tree for the expression.
   A + (B – C) * D + (E * F)

   OR

   Write the recessive inorder, preorder and post order tree traversal algorithm.

Unit - IV

4. a) What is complexity?
   b) What are the properties of algorithm?
   c) Differentiate between external and internal sort.
   d) Write an algorithm for selection sort.

   OR

   Sort 20, 35, 40, 100, 3, 10, 15 using quicksort.

Unit - V

5. a) Define Graph.
   b) What is meant by strongly connected in a graph?
   c) Explain different representation of graph.
   d) Compare graph traversal techniques.

   OR

   Explain the minimum spanning tree algorithms.

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