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B. Sc
MSIT 1202

2nd Semester Examination (2012 Syllabus): MAY 2016

DATA STRUCTURE USING 'C'

Full Marks: 60

Time: 3 Hrs.

Answer Question No.1 which is compulsory and any Five from the rest.

The figure in the right hand margin indicates marks.

PART – A

[10x1.5=15]

1. Answer the following:-

- a) Define abstract data type and list its advantages.
- b) What are the four basic operations of data structures?
- c) Find the maximum number of nodes in a binary tree of depth 5.
- d) How many edges a spanning tree of a connected graph with 10 vertices can contain?
- e) What are the advantages of linked list over an array?
- f) What is a Hash table?
- g) Mention the ways of representing a graph.
- h) What do you mean by in-degree and out-degree of a graph?
- i) What is self-referential structure?
- j) Find the postfix form of the infix expression $A*B+C/D$.

PART – B

[5x9=45]

2. a) Write program or an algorithm to insert an element in an array of integers. [5]
b) Define a sparse matrix. Explain how you can store elements in a sparse matrix efficiently. [4]
3. a) Write a C program to implement operations of a Stack using array. [5]
b) Write an algorithm to convert an infix expression to an equivalent postfix expression. [4]
4. a) Write 'C' functions for insertion and deletion operations of a linear queue using linked list. [5]
b) Write C functions to insert a node at the beginning and end of a singly linked list. [4]
5. a) Construct a Binary Search Tree (BST) for the following sequence of numbers and traverse it in appropriate order to show that the tree correctly constructed. 45,32,90,34,68,72,15,24 [5]
b) Construct a binary tree from the traversal order given below:
PREORDER: A B D E F C G H L J K
INORDER: D B F E A G C L J H K [4]