Code No. : **5275/O**

FACULTY OF INFORMATICS
B.E. 2/4 (IT) I Sem. (Old) Examination, December 2011
DATA STRUCTURES

Time: 3 Hours]

[Max. Marks: 75

Note : *Answer all questions of Part A. Answer five questions from Part B.*

PART – A   **(25 Marks)**

1. Define Big-Oh notation. Express the function $f(x) = 100x^2 + 4x + 2$ in Big-Oh notation and find values of C and no.   3

2. Convert the infix expresison to postfix and prefix form $a + (b - c) * (b + c) + d/(e - f)$.   2

3. Create a binary search tree with the following keys and perform inorder, preorder and postorder traversals on it 30, 20, 25, 40, 35, 36, 32, 45, 42.   4

4. Give the representation of weighted graphs.   2

5. Define a priority queue.   2

6. Define performance of a program. What are the components of space complexity ?   3

7. Define a Red-Black Tree with an example.   3

8. List down applications of queues.   2

9. Define a double linked list with an example.   2

10. List down applications of linked lists.   2

PART – B   **(5×10=50 Marks)**

11. a) Write a C++ program for bubble sort.   4

    b) Write short notes on :   (3+3)
       i) Asymptotic Notations
       ii) Time complexity.

12. a) Write a function for evaluation of postfix expression. Find the value of the expression $95 - 84/*$ using the function. Show complete tracing.   8

    b) List down applications of stacks.   2

13. Define a B-tree. Write algorithm for insertion into a B-Tree with an example. 10

14. a) Differentiate between linked lists and linear lists. 2

   b) Write procedure for insertion and deletion of an element from a double linked list. 8

15. Define a heap. Write algorithm for heap sort. Trace heap sort for following keys :
3, 1, 4, 1, 5, 9, 2, 6, 5, 4.
Find its timing complexity. 10

16. Define a graph. Write algorithms for graph search methods and explain them with example. 10

17. Write short notes on the following :

   a) AVL trees. 5

   b) Radix sort. 5