Third Semester B.E. Degree Examination, June 2012
Data Structures with C

Time: 3 hrs. Max. Marks:100

Note: *Answer FIVE full questions, selecting*
at least TWO questions from each part.

PART – A

1 a. Define a pointer. Write a C function to swap two numbers using pointers. **(05 Marks)**
b. Explain the functions supported by C to carryout dynamic memory allocation. **(05 Marks)**
c. Explain performance analysis and performance measurement. **(10 Marks)**

2 a. Define structure and union with suitable example. **(08 Marks)**
b. Write a C program with an appropriate structure definition and variable declaration to store information about an employee using nested structures. Consider the following fields like Ename, Empid, DOJ (Date, Month, Year) and salary (Basic, DA, HRA). **(12 Marks)**

3 a. Write a C-program to implement the two primite operations on stack using dynamic memory allocation. **(08 Marks)**
b. Write an algorithm to convert infix to postfix expression and apply the same to convert the following expression from infix to postfix :
i) $(a * b) + c/d$
ii) $(((a/b)-c) + (d * e)) – (a * c)$. **(12 Marks)**

4 a. Define linked list. Write a C program to implement the insert and delete operation on a queue using linked list. **(10 Marks)**
b. Write a C-function to add two polynomials using linked list representation. Explain with suitable example. **(10 Marks)**

PART – B

5 a. Define binary trees. For the given tree find the following :
i) Siblings
ii) Leaf nodes
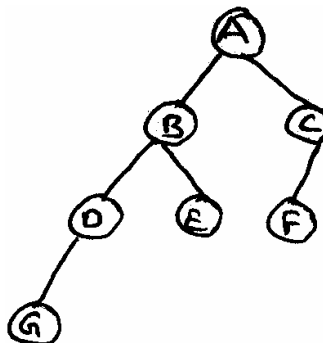iii) Non-leaf nodes
iv) Ancestors
v) Level of trees. **(08 Marks)**

Fig.Q.5(a)

b. Write the C-routines to traverse the given tree using i) inorder ; ii) pre order ; iii) post order. **(12 Marks)**

6 a. Define ADT of binary search tree. Write the iterative search function and recursive search function of BST. **(08 Marks)**

b. Construct the binary tree for the given expressions :
   i)   Pre order : $/ + * 1 \$ 2\ 3\ 4\ 5$
                 A B D G C E H I F
   ii)   In order : $1 + 2 * 3 \$ 4 - 5$
                 D G B A H E I C F. **(08 Marks)**

c. Define furest with example. **(04 Marks)**

7 a. Define leftlist trees. Explain varieties of leftlist trees. **(08 Marks)**

b. Write short notes on :
   i)   Priority queues
   ii)   Binomial heaps
   iii) Priority heaps
   iv)   Fibonacci heaps. **(12 Marks)**

8 a. Define AVL trees. Write a C-routine for
   i)   Inserting into an AVL tree
   ii)   LL and LR rotation. **(10 Marks)**

b. Explain the following with example :
   i)   Red-black trees
   ii)   Splay trees. **(10 Marks)**

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