Second Semester MCA Degree Examination, June/July 2016
Data Structures Using C

Time: 3 hrs.　　　　　　　　　　　　　　　　　　　　　　　Max. Marks:100

Note: *Answer any FIVE full questions.*

1　a.　What is a data structure? Describe ADT for an array in detail. (10 Marks)
　　b.　Discuss in detail about various character string operations. (10 Marks)

2　a.　Define stack. Write a 'C' program to implement PUSH and POP operations in stack.
　　　　(07 Marks)
　　b.　Convert the following infix expression to postfix expression showing the contents of the stack at each step.
　　　　　$((A - (B + C)) * D) \$ (E + F)$ (07 Marks)
　　c.　Write a program in 'C' to evaluate a postfix expression. (06 Marks)

3　a.　What is recursion? Discuss the properties of recursive definitions. List down the differences between iterative and recursive approach. (10 Marks)
　　b.　Implement binary search using recursion in C. (10 Marks)

4　a.　What is a queue? Perform 'C' implementation of Queues in detail. (10 Marks)
　　b.　Define linked list. Explain in detail about inserting and deleting nodes from a linked list.
　　　　(10 Marks)

5　a.　Explain in brief about the limitations of array implementation. (05 Marks)
　　b.　Discuss briefly about non-integer and non-homogenous lists. (05 Marks)
　　c.　What is a double linked list? Explain insertion and deletion operations of double linked list in detail. (10 Marks)

6　a.　What is selection sort? Perform selection sort for the input 23, 15, 29, 11, 1 and trace the same. (10 Marks)
　　b.　Write a program to implement quicksort in 'C'. (10 Marks)

7　a.　Discuss indexed sequential search in detail. (10 Marks)
　　b.　What is a binary search tree? Write down the procedures for inserting into a binary search tree and deleting from a binary search tree. (10 Marks)

8　a.　Write a program in 'C' to traverse a tree in inorder, preorder and postorder. (10 Marks)
　　b.　Explain AVL Trees and its operations in detail. (10 Marks)

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