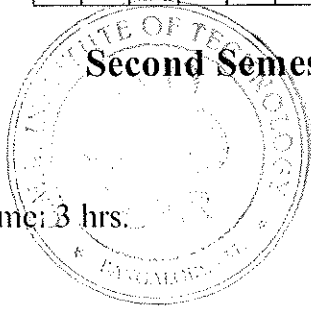


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13MCA21



**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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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and/or equations written e.g. 42-8 = 50, will be treated as malpractice.