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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.***

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 eg, 42+8 = 50, will be treated as malpractice.

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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