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## First Semester MCA Degree Examination, Dec.2016/Jan.2017 Data Structures Using C

Time: 3 hrs.

Max. Marks: 80

Note: Answer FIVE full questions, choosing one full question from each module.

### Module-1

- 1 a. Explain looping control structures of 'C' with syntax and examples. (08 Marks)  
b. Differentiate between call by value and call by reference functions with programming examples. (08 Marks)

OR

- 2 a. Explain various types of operators that are supported in 'C' language. (08 Marks)  
b. Explain with examples for passing array to functions and strings to functions. (08 Marks)

### Module-2

- 3 a. What is pointer? Give an account of function returning a pointer with program example. (08 Marks)  
b. Define structure. Explain how the structure variable passed as a parameter to a function with example. (08 Marks)

OR

- 4 a. What are arrays? Explain the concept of inserting an element in to an array. Write a program to implement the same. (08 Marks)  
b. What are strings? Mention any five string operation. Write a program to concatenate 2 strings without using built in functions. (08 Marks)

### Module-3

- 5 a. What are data structures? Explain the classifications of data structures. (08 Marks)  
b. Define stack. Write a 'C' program to implement stack operations using arrays. (08 Marks)

OR

- 6 a. Convert the following infix expression in to postfix using applications of stack.  
$$A + (B * C - (D / E ^ F) * G) * H$$
 (08 Marks)  
b. What is recursion? Write a program to implement towers of Hanoi problem using recursion and trace the output for 3 disks. (08 Marks)

### Module-4

- 7 a. Implement a menu driven program in 'C' for the following operations on singly linked list  
i) Perform insertion at the beginning  
ii) Perform Deletion at the beginning  
iii) Display the list  
iv) Exit (08 Marks)  
b. What are circular linked lists? Write 'C' functions to perform insertion and deletion operations at the end of circular lists. (08 Marks)

OR

- 8 a. What are Doubly linked lists? Write a program to implement stack operation using Doubly linked list. (08 Marks)
- b. What are priority queues? Write a program to simulate the working of priority Queues. (08 Marks)

Module-5

- 9 a. Construct the BST for the items 40, 60, 50, 33, 55, 11. Write and explain 'C' module to insert an element in to BST. (08 Marks)
- b. Write a C program to implement selection sort method and consider the elements to trace the output : 7, 3, 4, 1, 8, 2, 6, 5. (08 Marks)

OR

- 10 a. Write a program to implement Binary Tree Traversal methods. (08 Marks)
- b. Give an account of
- i) Hashing function
  - ii) Binary search. (08 Marks)

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