CBCS Scheme

USN | | | | | | | | | |

16/17MCA11

# First Semester MCA Degree Examination, Dec.2017/Jan.2018
## 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 different forms of if statements. **(08 Marks)**

b. Explain loop construct in programming. Briefly discuss the different loop constructs available in C. **(08 Marks)**

**OR**

2 a. What are arrays? How they are declared in C and explain how the initialization of arrays are done? **(06 Marks)**

b. What is the purpose of function in C programming? Write a program using function that receives 5 integers and returns the sum and average of these numbers. Call this function from main( ) and print the result in main( ). **(10 Marks)**

### Module-2

3 a. What is pointer? Explain notation with the help of an example. **(04 Marks)**

b. What do you mean by structure? How structure elements are stored? Explain with the help of an example. **(06 Marks)**

c. What is a data structure? Describe ADT for an array in detail. **(06 Marks)**

**OR**

4 a. Differentiate between structure and unions. **(04 Marks)**

b. What are the various memory allocation techniques? Explain how dynamic allocation is done using malloc( )? **(08 Marks)**

c. Describe ADT for STRING in detail. **(04 Marks)**

### Module-3

5 a. What is recursion? Discuss the properties of recursive definitions. List down the differences between iterative and recursive approach. **(08 Marks)**

b. Define stack. Write a 'C' program to implement PUSH and POP operations in stack. **(08 Marks)**

**OR**

6 a. What is a queue? Perform 'C' implementation of queues in detail. **(08 Marks)**

b. Write an algorithm to convert infix to postfix expression. **(08 Marks)**

### Module-4

7 a. Define Linked list. Write a C program to implement the insert and delete operation on queue using single linked list. **(08 Marks)**

b. What is a double linked list? Explain insertion and deletion operations of double linked list in detail. **(08 Marks)**

**OR**

8 a. Explain the different types of linked list with diagram. **(08 Marks)**

b. Write a function to search a node with value x in a list of integers. If found, then delete the node. **(08 Marks)**

## Module-5

9 a. Write C function for the following tree traversals:
i) inorder
ii) preorder
iii) postorder **(08 Marks)**

b. What are the binary trees? Mention different types of binary trees and explain any two of them clearly. **(08 Marks)**

**OR**

10 a. Write a program to implement quicksort in 'C'. **(08 Marks)**

b. What is hashing? Explain any two methods to resolve hash clashes. **(08 Marks)**

* * * * *