

# 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)

\* \* \* \* \*