II Semester B.A./B.Sc. Examination, April/May 2015
(2014-15 and Onwards) (CBCS) (Fresh)
COMPUTER SCIENCE – II
Data Structures

Time : 3 Hours

Max. Marks : 70 (F)

Instruction : *Answer **all** Sections.*

SECTION – A

I. Answer **any ten** questions. **Each** question carries **2** marks : **(2×10=20)**

1) Define data structure. Mention its types.

2) Define time complexity and space complexity.

3) Write a program to find the length of a string without using inbuilt function.

4) Write one advantage and one disadvantage of an array.

5) Mention the difference between static and dynamic memory allocation.

6) Write any 2 difference between linear search and binary search.

7) Write one advantage and one disadvantage of linked list.

8) What is dequeue ? Mention two types of dequeue.

9) Write any two applications of stack.

10) Write any two applications of linked lists.

11) Define the following terms :

a) Directed graph

b) Weighted graph.

12) Define complete binary tree and strictly binary tree.

## SECTION – B

II. Answer the following. **Each** question carries **10** marks : **(5×10=50)**

13) a) Explain memory representation of arrays. 6

b) Explain various data structure operations performed on non-primitive data structures. 4

OR

c) Explain towers of hanoi problem. 5

d) Write a program to copy one string into another string. 5

14) a) Write an algorithm to delete an element from a given array. 5

    b) Write an algorithm to implement binary search. 5

          OR

    c) Write an algorithm for selection sort and trace the algorithm for the following elements :
15, 6, 13, 22, 3, 52, 2. 10

15) a) Write an algorithm to insert a node in to the linked list. 5

    b) Compare singly linked list and doubly linked list with an example. 5

          OR

    c) Explain circular linked list with an example. 5

    d) Write an algorithm to implement bubble sort. 5

16) a) Write a program to demonstrate the working of stack using an array. 5

    b) Explain the algorithm for evaluation of postfix expression. 5

          OR

    c) Write a program to implement queue using array. 5

    d) Explain the operations performed on circular queue. 5

17) a) Write recursive algorithm for pre-order, in-order and post-order traversals of a tree. 7

    b) Write the pre-order, in-order and post-order traversals for the given binary tree. 3
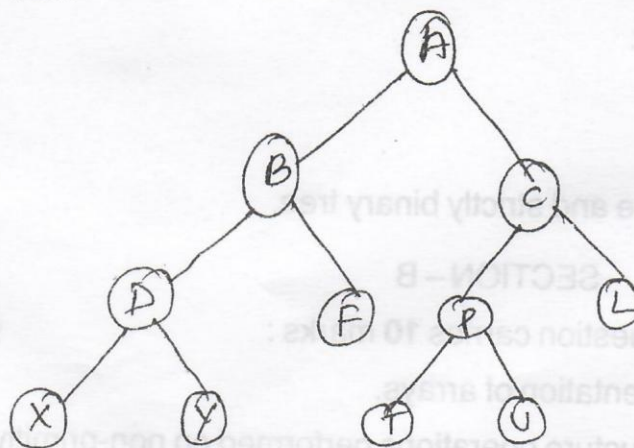
          OR

    c) Explain depth first search algorithm with an example. 5

    d) Explain the representation of graph in memory. 5