NS – 357

III Semester B.A./B.Sc. Examination, Nov./Dec. 2016
(Semester Scheme)
(2014-15 only) (Repeaters)
COMPUTER SCIENCE – III
Data Structures and Algorithms

Time : 3 Hours Max. Marks : 70

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

SECTION – A

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

1) Define data structure. Name any two data structure.
2) Write any two operations on primitive data structure.
3) What is a string ? How is it stored in memory ?
4) What is recursion ?
5) What is searching ? Mention the techniques of searching.
6) Write two applications of stack.
7) Convert the following infix to postfix expression.
   (A + B ^ C) * (E/D)
8) What are the different types of queues ?
9) Define priority queues.
10) What is a doubly linked list ?
11) Define Binary tree.
12) What is meant by node and edges in a graph ?

SECTION – B

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

13) a) i) Explain the classification of data structures. **5**
    ii) What are the different operations performed on strings ? Give examples. **5**

OR

b) i) Write an algorithm to delete an element in an array. **5**
   ii) Write a program to find ${}^{n}C_{r}$ using recursion. **5**

P.T.O.

14) a) Explain Towers of Hanoi problem for three disks. **10**

OR

b) i) Write an algorithm to insert an element at the beginning of the linked list. **5**

ii) Define queue. What are the operations performed on queues ? **5**

15) a) i) What is stack ? Explain the operations performed on the stack. **5**

ii) Explain circular linked list. **5**

OR

b) i) Write an algorithm to evaluate postfix expression. **5**

ii) Explain various representations of graph in memory. **5**

16) a) i) Write an algorithm to search an element using linear search. **5**

ii) Mention different types of linked list with an example. **5**

OR

b) Explain bubble sort algorithm to sort the following elements. **10**

13 41 25 7 96 4

17) a) i) Explain depth first search algorithm with an example. **5**

ii) Explain pre-order traversal algorithm with an example. **5**

OR

b) i) Explain linked list representation of binary tree. **5**

ii) Write an algorithm to delete an element from circular queue. **5**