Roll No. .....

(01/22-II)

5195

B.A./B.Sc. EXAMINATION

(Third Semester)

COMPUTER SCIENCE

Paper–I

Data Structure Using 'C'

Time : Three Hours *Maximum Marks :* { B.Sc. : 30 / B.A. : 20

Note : Attempt *Five* questions in all, selecting *one* question from each Unit including Q. No. **1** which is compulsory. All questions carry equal marks.

(Compulsory Question)

1. (a) What is the difference between Array and Linked List ?

   (b) Define the terms with respect to a Graph :

   (i) In-degree

(ii) Out-degree

(iii) Closed path

(iv) Directed Graph.

(c) What do you mean by Double Ended Queue ?

(d) Define Complete Binary Tree. Give example.

(e) What is Recursion ?

(f) What is a Header Linked List ?

Unit I

2. What is a Data Structure ? What is the need of data structure ? Explain its various types.

3. What is a string ? Explain various methods to store strings in computer memory.

Unit II

4. What do you mean by Stack ? Write algorithm for PUSH operation. Also evaluate the following expression P written in Post-fix notation :

P : 5, 6, 2, +, *, 12, 4, /, –.

5. Write an algorithm to insert a node in a Linked List after a given node P.

Unit III

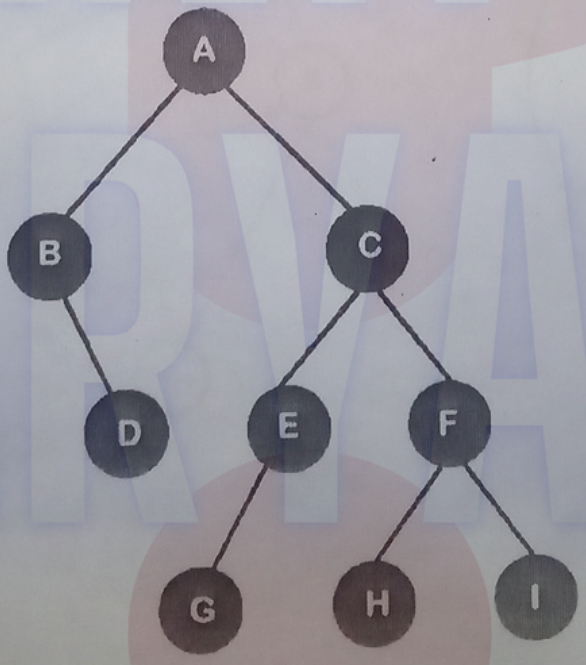
6. (a) Given that :

In-order : E A C K F H D B G

Pre-order : F A E K C D H G B

Draw the tree.

(b) Traverse the following tree in Pre-order, In-order and Post-order :



7. Write algorithms of Insert (Enqueue) and Delete (Dequeue) operations of Queue.

Unit IV

8. Write algorithm for Binary Search. Also give an example.

9. Discuss Adjacency Matrix and Adjacency List representation of the following graph :