# Third Semester B. Sc. Examination

## COMPUTER SCIENCE

### Paper - I

### (Data Structures)

Time : Three Hours ] [ Max. Marks : 50

N. B. : (1) All questions are compulsory and carry equal marks.
(2) Draw neat and well labelled diagram wherever necessary.

**EITHER**

1. (A) Write an algorithm to insert a node at the end in single linked list. 5

(B) Explain the representation of a double linked list in memory. 5

**OR**

(C) What is linked list ? Write an algorithm to count the number of nodes in linked list. 5

(D) Write an algorithm to delete an element from front of the double linked list. 5

**EITHER**

2. (A) Write an algorithm to translate an infix expression to postfix expression. 5

(B) Explain quick sort method with suitable example. 5

**OR**

(C) What is recursion ? Explain tower of hanoi problem. 5

(D) Convert following expression to prefix and postfix form.

((A + B) ∧ C – (D * E)/F) . 5

**EITHER**

3. (A) What is Queue ? Write an algorithm for insertion operation on Queue. 5

(B) Explain Big–O Notations. 5

**OR**

(C) Explain collision resolution with its technique. 5

(D) Explain merge sort method with suitable example. 5

**EITHER**

4. (A) Explain BSF and DFS methods of traversal of graph. 5

(B) What is Binary tree ? Explain representation of Binary trees in memory. 5

**OR**

(C) Write an algorithm for preorder traversal of binary tree. 5

(D) Explain the representation of Graph as linked representation. 5

5. (A) What is underflow and overflow situation in linked list ? $2\frac{1}{2}$

(B) Convert infix to postfix and evaluate.

$A + (B * C) / D$

where $A = 2$, $B = 3$, $C = 4$ and $D = 6$ $2\frac{1}{2}$

(C) What is Hashing ? Explain. $2\frac{1}{2}$

(D) Explain Heap Sort Method. $2\frac{1}{2}$