Bachelor of Science (B.Sc.I.T.) Semester—III (C.B.S.) Examination

DATA STRUCTURES

Paper—II

Time : Three Hours] [Maximum Marks : 50

Note :— (1) **All** questions are compulsory and carry equal marks.

(2) Draw neat and labelled diagrams wherever necessary.

EITHER

1. (a) Give the memory representation of a single linked list. 5

(b) Write an algorithm to insert a note in a single linked list. 5

OR

(c) Give the dynamic representation of a double linked list. 5

(d) How will you represent a polynomial in a linked list ? 5

EITHER

2. (a) Explain the following terms :

(i) Overflow in stack

(ii) Underflow in stack. 5

(b) Write a recursive algorithm to generate the terms of Fibonacci series. 5

OR

(c) Explain Quick Sort Method with a suitable example. 5

(d) Convert the following infix expression to prefix and postfix :

$$\frac{e^{x+y} + e^{x-y}}{e^{x+y} - e^{x-y}}.$$ 5

EITHER

3. (a) Give the array and linked representation of a queue. 5

(b) Explain with an example merge sort. 5

OR

(c) Write a short note on hashing and collision resolution. 5

(d) What is priority queue ? Explain array representation of priority queue. 5

EITHER

4. (a) Write an algorithm for inorder traversal of a tree. 5

(b) Explain breadth first search with an example. 5

OR

(c) Form a heap for the following list of numbers :

25 36 49 15 9 12 16 18 5

(d) Explain the linked representation of a graph. 5

5. Attempt **ALL** :

(A) Explain header linked list. 2½

(B) Discuss tower of Hanoi problem. 2½

(C) Write a short note on deque. 2½

(D) Traverse the following binary tree in pre-order : 2½