NKT/KS/17/5309

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

DATA STRUCTURES

Paper—II

Time : Three Hours] [Maximum Marks : 50

N.B. :— (1) **ALL** questions are compulsory and carry equal marks.

(2) Draw neat and well labelled diagrams wherever necessary.

EITHER

1. (A) What is linked list ? Explain the representation of single linked list in memory. 5

(B) Write an algorithm to insert element at the beginning of double linked list. 5

OR

(C) Write an algorithm to delete the last node of single linked list. 5

(D) Write an algorithm to add the two polynomial as linked list. 5

EITHER

2. (A) Write an algorithm to insert an element on stack. 5

(B) Write an algorithm to evaluate the postfix expression. 5

OR

(C) Explain the Tower of Hanoi problem. 5

(D) For the following recursive function

$$H(N) = \begin{cases} 3 * N & \text{if } N < 5 \\ 2 * H(N-5) + 7 & \text{otherwise} \end{cases}$$

find H(24). 5

EITHER

3. (A) Write an algorithm to insert an element in a circular queue. 5

(B) Explain insertion sort method with a suitable example. 5

OR

(C) What is hashing ? Explain any two hashing techniques. 5

(D) Write an algorithm for selection sort method. 5

EITHER

4. (A) Define binary tree. Explain the sequential representation of binary tree in memory. 5

(B) Explain BFS method of traversing a graph. 5

OR

(C) Write an algorithm to search a given element in binary search tree. 5

(D) Explain the linked list representation of graph in memory. 5

5. Attempt **all** :

(A) Explain double linked list. 2½

(B) Translate the following infix expression into prefix and postfix form :

A * (B + D) / E – F * (G + H / K) 2½

(C) Explain priority queue. 2½

(D) Explain Heap tree. 2½