NKT/KS/17/5130

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

COMPUTER SCIENCE

(Data Structures)

Paper—I

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) Write short notes on :

(i) Garbage collection

(ii) Overflow and underflow. 5

(b) Write an algorithm to delete the first node from a linked list. 5

OR

(c) What is a header list ? Explain one way and two way circular header list. 5

(d) What is two way linked list ? Write an algorithm to insert an element at the beginning of two way linked list. 5

EITHER

2. (a) What is a Stack ? Explain push and pop operations on stack. 5

(b) Write an algorithm to convert an infix expression into postfix. 5

OR

(c) Explain quick sort with an example. 5

(d) Write an algorithm for evaluation of a postfix expression. 5

EITHER

3. (a) What is a priority queue ? Give its memory representation. 5

(b) Write an algorithm to delete an element from a linear queue. 5

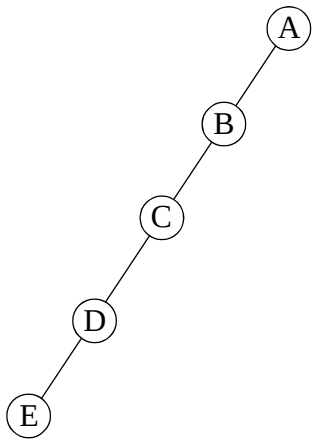
OR

(c) Write a short note on hashing techniques. 5

(d) Write an algorithm for selection sort. 5

EITHER

4. (a) Define a binary tree. Traverse the following binary tree in preorder and postorder. 5



(b) Explain the array representation of a graph. 5

OR

(c) Explain the method for breadth first search in a graph. 5

(d) What is a heap ? How will you insert an element in a heap ? 5

5. Attempt **all** :

(a) What are the advantages of double linked list over single linked list ? 2½

(b) Convert the following infix expression into prefix :

A | (B – D) / (E – F) ^ G 2½

(c) Write a short note on deque. 2½

(d) Explain binary search tree. 2½