

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

COMPUTER SCIENCE (DATA STRUCTURES)

Paper—1

Time : Three Hours]

[Maximum Marks : 50

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

(2) Draw neat and labelled diagrams wherever necessary.

EITHER

1. (a) What is linked list ? Explain its memory representation. 5
 (b) Write an algorithm to insert a node at the beginning of linked list. 5

OR

- (c) What is a doubly linked list ? Write an algorithm to delete the last node from a doubly linked list. 5
 (d) Write an algorithm to delete the front node of a single linked list. 5

EITHER

2. (a) Explain the stack and representation of a stack. 5
 (b) Write the algorithms for push and pop operations on stack. 5

OR

- (c) Convert the following expression to prefix and postfix :
 $A + (B * D/E) * (F + G/H) * K.$ 5
 (d) Write a recursive algorithm for Tower of Hanoi problem. 5

EITHER

3. (a) Write short notes on :
 (i) Deque 5
 (ii) Priority queue. 5
 (b) Write an algorithm for inserting a node in a circular queue. 5

OR

- (c) Explain with an example the selection sort technique. 5
 (d) What is hashing ? Explain various hashing functions. 5

EITHER

4. (a) Write an algorithm for pre order traversal of a binary tree. 5
 (b) Explain the linked representation of a graph. 5

OR

- (c) Explain the steps for depth first search in a graph. 5
 (d) Explain Heap Sort method with suitable example. 5

5. Attempt **ALL** :

- (a) Differentiate between single linked list and two way linked list. 2½
 (b) Explain recursion with an example. 2½
 (c) Write a short note on complexity of algorithm. 2½
 (d) Write the adjacency matrix for the following graph. 2½

