# Bachelor of Computer Application (B.C.A.) Semester-III (C.B.S.) Examination DATA STRUCTURES <br> Paper-III 

Time : Three Hours]
[Maximum Marks : 50
Note :-(1) ALL questions are compulsory and carry equal marks.
(2) Draw neat and labelled diagram wherever necessary.

## EITHER

1. (a) Write an algorithm to insert the element at the end of single linked list.
(b) What is header linked list? Write an algorithm to search specific item from circular linked list.

## OR

(c) Write an algorithm to delete the last node of double linked list.
(d) Write an algorithm to insert element at the beginning of single linked list.

## EITHER

2. (a) Write an algorithm to convert Infix expression to Postfix expression.
(b) Let A and B be non-negative integers. Suppose a function GCD is recursively defined as follows :

$$
\operatorname{GCD}(\mathrm{A}, \mathrm{~B})= \begin{cases}\operatorname{GCD}(\mathrm{B}, \mathrm{~A}) & \text { if } \mathrm{A}<\mathrm{B} \\ \mathrm{~A} & \text { if } \mathrm{B}=0 \\ \operatorname{GCD}(\mathrm{~B}, \operatorname{MOD}(\mathrm{~A}, \mathrm{~B})) & \text { Otherwise }\end{cases}
$$

find GCD $(12,24)$

$$
\text { GCD }(32,8)
$$

## OR

(c) Write a recursive algorithm for Tower of Hanoi Problem.
(d) Evaluate the Postfix Notation. (Using Application of STACK)

$$
5,12,4,-, *, 8,2, \mid,+
$$

## EITHER

3. (a) Define Priority Queue. Explain Array representation of priority Queue in Memory.

5
(b) Explain Insertion Sort method with a suitable example.

OR
(c) What is hashing ? Explain different hashing functions.
(d) Write an algorithm to delete an element from Queue.

## EITHER

4. (a) Explain the representation of Graph in Memory.
(b) Write an algorithm for traversing the binary tree in inorder.

OR
(c) Write and explain BFS method of traversing graph with a suitable example.
(d) Write a procedure to Insert an element in heap.
5. Attempt ALL :
(a) What are the advantages of two way linked list?$2^{1 / 2}$
(b) What do you mean by base criteria in Recursion? $\quad 2^{1 / 2} 2$
(c) What is collision ? Explain. $2^{1 / 2}$
(d) Explain weighted graph.

