Bachelor of Computer Application (B.C.A.) Semester–III Examination

DATA STRUCTURES

Paper–III

Time : Three Hours] [Maximum Marks : 50

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

(2) Draw neat and labelled diagram wherever necessary.

EITHER

1. (a) What is a single linked list ? Explain how it is represented in memory. 5

(b) Write an algorithm to traverse a circular linked list. 5

OR

(c) Write an algorithm to delete a node from the front of a linked list. 5

(d) How polynomial expression can be represented using linked list ? Explain. 5

EITHER

2. (a) Translate the following infix expression in prefix and postfix notation :

(i) a + (b – c) ∗ d / (e ∗ f)

(ii) (a + b ∗ c) / ((a + b) ∗ c) 5

(b) Explain Quick sort using example. 5

OR

(c) Create a stack for performing the following operations :

(i) Push A

(ii) Push B

(iii) Pop

(iv) Push C

(v) Pop. 5

(d) What is recursion ? How Tower of Hanoi problem can be solved using recursion ? 5

EITHER

3. (a) What is a queue ? What are the two ways in which a queue can be represented ? 5

(b) Sort the following data using selection sort :

6, 1, 4, 3, 5, 2, 7 5

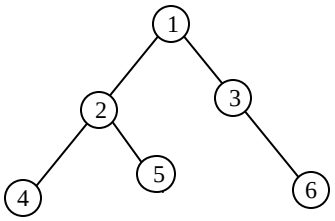
OR

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

(d) What is collision ? Explain collision resolution techniques. 5

EITHER

4. (a) Write preorder, inorder and postorder traversal of the following binary tree.



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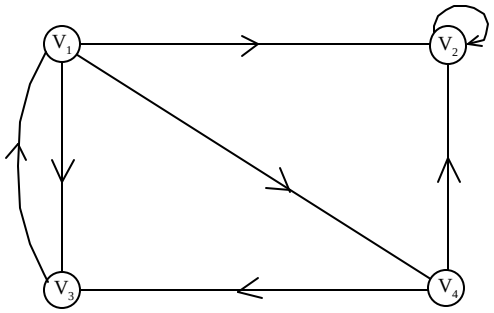
(b) Explain BFS method of graph traversal. 5

OR

(c) What is binary search tree ? Also give its sequential representation. 5

(d) Represent the following graph in adjacency matrix.



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5. (a) Differentiate between single and double linked list. 2½

(b) Write an algorithm to insert an element into stack. 2½

(c) What is hashing ? Explain any one method of hashing with example. 2½

(d) What do you mean by heap tree ? Explain with example. 2½