3rd SEM./CSE/IT/ 2021(W)

CST301 Data Structure

Full Marks: 80   Time- 3 Hrs

Answer any five Questions including Q No.1& 2

Figures in the right hand margin indicates marks

1.   Answer **All** questions   2 x

10

a.   State the need of a Data structure.

b.   Define queue. Write the applications of queue data structure.

c.   What are the advantages of linked list over array?

d.   Define degree of node in a graph.

e.   Define a complete binary tree

f.   Write any string function with example.

g.   What postfix expression is equivalent to the following infix expression?

$(A + B) - C * D / (E - F / G)$

h.   How 2 dimensional array is represent in memory

i.   Define sparse matrix

j.   Explain overflow and underflow condition.

2.   Answer Any Six Questions   5X6

a.   Define data structure and discuss different type operation on data structure

b.   Discuss about the best case, worst case and average case complexity

c.   Define linear array. Write an algorithm to insert an element in a linear array.

d.   Define BST. Construct a binary search tree with 45, 15, 79, 90, 10, 55, 12, 20, 50

e. Define stack. Write an algorithm for POP operation.

f. Discuss about garbage collection.

g   Define linked list .Write an algorithm for traversing a linked list.

3   Define graph .Discuss about adjacency matrix.   10
        Construct the adjacency matrix for the below undirected weighted
        graph?
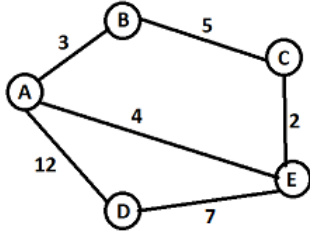
4   Define tree and discuss about different type of tree traversal with   10
        example.
5   Define queue. What are the different types of queue? Write an   10
        algorithm for inserting an element in a queue.
6   Define searching. Write an algorithm for binary search and discuss it   10
        with an example.
7   Discuss about different collision resolution technique   10