B. Tech Second Year : 3rd Semester

Data Structures & Algorithms, Jan.,-2012

(FOR 3EC6 BRANCH OF ENGINEERING)

Times : 3 Hours | **Min. Passing Marks : 24** | **Total Marks : 80**

Attempt any five questions selecting one question from each unit. All questions carry equal marks. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.)

Unit–'I'

1. What is complexity of Algorithm? Explain the various type of Notation's used for time complexity of Algorithm. **[16]**

OR

1. (a) Write an algorithm to insert an element in ordered linklist. **[10]**

(b) What is circular linklist? What are the advantages of circular linklist over the singly linklist? **[6]**

Unit–'II'

2. (a) What do you understand by 2-D array? How the 2-D array is represented in memory? Explain. **[10]**

(b) Write an algorithm to delete an item from linear array. **[6]**

OR

2. (a) What are the types of representation of sparse matrix in memory? **[10]**

(b) Write an algorithm to multiply two matrices. **[6]**

Unit–'III'

3. (a) Write an algorithm to evaluate postfix expression. Explain the each steps to evaluate the following postfix expression

P : 5, 3, +, 4, –, 8, 2, l, ^. **[12]**

(b) Write the condition to find the overflow for the circular Queue. **[4]**

OR

3. Explain the push and pop operations over the stack if it is implemented through linklist. **[16]**

Unit–'IV'

4. Suppose the following sequences list the nodes of a binary tree T in preorder and inorder respectively.

Preorder: G B Q A C K F P D E R H

inorder : Q B K C F A G P E D H R

Draw the diagram of the tree T. (Explain each step). **[16]**

OR

4. Suppose the following list of numbers is inserted into empty binary search tree. Draw the resulting binary search tree

10, 18, 4, 7, 20, 5, 13, 8, 16, 1, 6, 17

also find the height of binary tree. **[16]**

Unit–'V'

5. Write short notes (any two) **[2×8]**

(a) Adjacency Matrix

(b) Minimum spanning tree

(c) Graph Traversal

OR

5. (a) Write an Algorithm to sort the given list of n data items using Bubble sort. **[8]**

(b) Explain the steps to sort the following list of numbers using selection sort.

13, 9, 4, 18, 5, 19, 2, 10 **[8]**