6E3113

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B. Tech. VI Semester (Main/Back) Exam. May/June 2013

ELECTRICAL ENGINEERING # 6EE5

DATA STRUCTURES IN C

Time : 3 Hours **Min. Passing Marks : 24** **Maximum Marks : 80**

Instruction to Candidates :

*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. Write an Algorithm to find largest number in a sorted list. Find its best, average and worst case complexities. **[16]**

OR

2. (*a*) What do you understand by Asymptotic notation of an Algorithm. Explain various asymptotic notations. **[8]**

   (*b*) Discuss Advantages and Disadvantages of Link list over Arrays. Also discuss various types of link lists. **[8]**

Unit–'II'

3. Define two matrix of identical size and write Algorithm for following operations

   (*a*) Element by element matrix addition **[4]**

   (*b*) Transpose of a matrix **[6]**

   (*c*) Matrix Multiplication **[6]**

OR

5. Derive and Explain formula for calculating the address of any specified member of 2D matrix if matrix is represented in memory as

   (*a*) Row major mapping **[8]**

   (*b*) Column major mapping **[8]**

Unit–'III'

5. (*a*) Discuss any two applications of stack in detail. **[8]**

   (*b*) Write and discuss Algorithm for basic operations in stack. **[8]**

OR

6. Write a C Program to implement a priority Queue using link list. **[16]**

Unit–'IV'

7. Write and discuss Algorithm for Pre, post and In-order binary tree traversal. **[16]**

OR

8. Discuss following tree with the help of suitable example

   (*a*) AVL Tree **[8]**

   (*b*) B=Tree **[8]**

Unit–'V'

9. Write short notes on following: **[8×2=16]**

   (*a*) Graph Representation Methods

   (*b*) Minimum Spanning tree

OR

10. Write short notes on following: **[4×4=16]**

    (*a*) Heap sort

    (*b*) Merge sort

    (*c*) Selection sort

    (*d*) Insertion sort