

6E3113

Roll No. \_\_\_\_\_

Total No of Pages: **3**

**6E3113**

**B. Tech. VI-Sem. (Old Back) Exam., April/May-2016**

**Electrical Engineering**

**6EE5 (O) Data Structures in C**

**Common for EE and EX**

**Time: 3 Hours**

**Maximum Marks: 80**

**Min. Passing Marks (Old Back): 24**

**Instructions 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 may suitably be assumed and stated clearly.*

*Units of quantities used/ calculated must be stated clearly.*

*Use of following supporting material is permitted during examination.*

1. NIL \_\_\_\_\_

2. NIL \_\_\_\_\_

**UNIT-I**

Q.1 (a) What do you understand by time-space tradeoff? [8]

(b) What is rate of growth of any function? Explain all asymptotic notations in details. [8]

**OR**

Q.1 (a) What is difference between array and linked list? [6]

(b) Write an algorithm for creating and traversing a doubly linked list. [10]

## UNIT-II

- Q.2 (a) Explain row and column major mapping. [6]
- (b) There is a matrix A with 50 rows and 40 columns and the base address is 2000. Size of data type is 2 byte. Calculate the address of:
- (i) A [20] [30] in row major mapping [2.5]
- (ii) A [17] [37] in row major mapping [2.5]
- (iii) A [49] [39] in column major mapping [2.5]
- (iii) A [18] [7] in column major mapping [2.5]

### OR

- Q.2 (a) What do you understand by sparse matrix representation? How elements are stored in sparse matrix? [10]
- (b) Write steps to add two sparse matrixes. [6]

## UNIT-III

- Q.3 (a) Define stack? Explain its basic operation and implement stack using linked list. [8]
- (b) Transform each of the following infix expression into post fix expression:
- (i)  $a * (b+c) - d/e$  [4]
- (ii)  $A + (B * C - (D/E \wedge F) * G) * H$  [4]

### OR

- Q.3 (a) Write short note on Tower of Hanoi problem and also write a recursive solution for TOH problem. [10]
- (b) What are dequeue and priority queues? What are their uses? [6]

## UNIT-IV

Q.4 Write short notes on:

- (a) Strictly binary tree [4]
- (b) Complete binary tree [4]
- (c) Almost complete binary tree [4]
- (d) Binary search tree [4]

OR

Q.4 What do you understand by Height balanced tree? Explain the insertion in height balanced tree.

Insert the following keys in AVL tree -

A, Z, B, Y, C, X. [16]

## UNIT-V

Q.5 (a) Define the following terms with suitable examples -

- (i) connected graph [2]
  - (ii) non-connected graph [2]
  - (iii) complete graph [2]
  - (iv) directed graph [2]
- (b) Define BFS and write steps to explain BFS. [8]

OR

Q.5 Write quick – sort algorithm? Explain its complexity in details. [16]

-----