

**3E1652**

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

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**B. Tech. III Semester (Main/Back) Examination-2014**  
**Computer Engg. & Information Tech.**  
**3CS2A & 3IT2A Data Structures and Algorithms**

**Time : 3 Hours****Maximum Marks : 80****Min. Passing Marks : 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 suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.)*

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**Unit - I**

1. a) Is there any difference among algorithm, pseudocode and program? Explain.
- b) Compute the addresses of a 3d array in column major form.

**OR**

1. a) Is there any difference among  $Q$ ,  $O$  and  $\Omega$  notations of time complexity? Explain.
- b) Compute the addresses of a 3d array elements in row major form.

**Unit - II**

- a) Write an algorithm to insert a data item in a circular queue.
- b) How will you use arrays for multiplication of polynomials? Explain.

**OR**

- a) Write an algorithm for transposition of a Sparse matrix. Discuss its time complexity.
- b) Convert  $(a+(b*(c-d)+(e)-(f*g)))$  into postfix notation.

### Unit - III

3. a) Write an algorithm to delete a node in a doubly linked list.
- b) Apply binary search to find 123 in a list.  
49, 98, 101, 123, 149, 194, 199, 211, 240, 286, 840, 930 (12 data)

OR

3. a) Write an algorithm to dequeue an element in a queue. The queue is implemented using linked list.
- b) Is there any difference between ordered and unordered list? What is the use of a head node in a linked list? Explain.

### Unit - IV

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4. a) Write an algorithm to delete a data key from a threaded binary tree.
- b) How will you use a tree for representing a set? Explain.

OR

4. a) Is there any difference between threaded and unthreaded binary tree? What is a B tree? Explain.
- b) Insert the following data keys in an AVL tree.  
16, 23, 9, 163, 64, 29, 73, 83, 90, 96 (10 keys)

### Unit - V

5. a) Is there any difference among forest, graph and tree? Explain.
- b) Write prim's algorithm to get minimum spanning tree out of a graph.

**GR**

5. Write short notes (on any two)

a) Topological sort

b) heap sort

c) Dijkstra algorithm.

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