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5E3256

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B. Tech. (Sem. V) (Main/Back) Examination, December - 2013
Computer Science
5CS6.1 Advanced Data Structure   (Common for Computer & IT)

Time : **3** Hours]   [Total Marks : **80**
                                        [Min. Passing Marks : **24**

*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.*

Use of following supporting material is permitted during examination.
(Mentioned in form No. 205)

1. _____ **NIL** _____   2. _____ **NIL** _____

UNIT - I

1   Explain Huffman Trees in detail. Suppose we are given the
     following table of letter frequencies

a	b	c	d	e	f
1	2	3	4	5	6

Create a Huffman coding tree for this table.

                                                        16
OR
1   Describe 2-3 Trees with the help of an appropriate example.
     Explain various operations performed on the 2-3 tree.

                                                        16

UNIT - II

2   What are Binomial Trees ? Explain how we can implement
     Binomial Heaps and also explain its various operations.

                                                        16
OR
2   (a) Explain 2-3-4 Trees with the help of an example. Explain
          the function of insertion and deletion with an example.

                                                        12

     (b) Write short note on Fibonacci Heap.

                                                        4

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UNIT - III

3   Explain the following terms incorporated with graphs with the help of examples.
(a)   Circuits
(b)   Cut-sets
(c)   Cut-Vertices Planer
(d)   Dual graphs.

4+4

OR

3   (a)   Write and explain SingleMin-Cut Max-Flow theorem of Network Flows.

8

(b)   Write and explain Ford-Fulkerson Max Flow Algorithms.

8

UNIT - IV

4   What is SORTING NETWORK ? Explain zero-one principle and bitonic sorting and merging network sorter in detail.

16

OR

4   (a)   Explain various operations on Disjoint sets also describe its union-find problem.

8

(b)   Describe the concept of Priority Queues using 2-3 Trees.

8

UNIT - V

5   (a)   Explain the use of number theoretic notions in data structures.

6

(b)   Describe division theorem with the help of an appropriate example.

10

OR

5   (a)   What is Modular Arithmetic ? Also explain methods to solve Modular Linear equation.

12

(b)   Write short note on primality testing and Integer Factorization.

4

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