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Roll No. _____	Total No of Pages: 3
5E5106	5E5106
B. Tech V Sem. (Main/Back) Exam. Nov-Dec. 2015	
Computer Science & Engineering	
5CS6.1 Advance Data Structure	
Common with IT	

Time: 3 Hours

Maximum Marks: 80

Min. Passing Marks Main: 26

Min. Passing Marks 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 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) Define Red Black Tree. Explain Algorithm of Insertion in Red Black Tree with the help of suitable example. [2+8=10]

(b) Explain Dynamic Order Statistics with the help of suitable example. [6]

OR

Q.1 (a) Define Huffman Tree. Construct a Huffman tree stream of characters. "eehbcecdbeebcececddebbcececdbeeddeeececddececdbececdab eedeececdabee" [2+8=10]

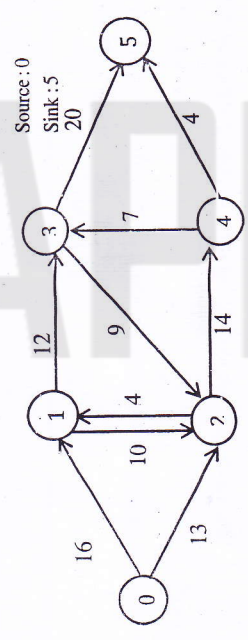
(b) Explain Interval Tree with the help of suitable example. [6]

UNIT-II

- Q.2 (a) Prove that total number of nodes in Binomial Heap at depth is kC_i for $i=0, 1, \dots, k$ [6]
 (b) Write Algorithm to explain Insertion and Union operation Binomial Heap with the help of suitable example [10]
- OR
- Q.2 (a) Write Algorithm to explain Insertion and Decreasing Key operation in Fibonacci Heap with the help of suitable example. [10]
 (b) Define Amortization Analysis with the help of suitable example. [6]

UNIT-III

- Q.3 (a) Given, a graph which represents a flow network where every edge has a capacity. Also given, two vertices source 's' and sink 't' in the graph, find the maximum possible flow from s to t with following constraints. [12]



- b) Define Cut-Vertices Planer and Dual graph with the help of example. [4]
- OR
- Q.3 (a) Explain Algorithm for connectedness with the help of suitable example [8]
 (b) Explain Strongly Connected Components. Write an Algorithm for topological sort. [3+5=8]

UNIT-IV

- Q.4 (a) Explain Zero-one principle with the help of suitable example. [8]
 (b) Explain Bitonic Sorting Network with the help of suitable explain. [8]
- OR
- Q.4 (a) Explain Priority Queue and Concatenable Queue in 2-3 tree in detail. [8]
 (b) Explain operation on Disjoint sets and its union-find problem. [8]

UNIT-V

- Q.5 (a) Explain Fermat Primality and Miller-Rabin Primality test in detail. [6]
 (b) State and Prove Chinese Remainder Theorem. [10]
- OR
- Q.5 (a) Explain Pollard's RHO Algorithm in detail. [8]
 (b) Explain Modular Arithmetic with the help of suitable example. [8]