5E5106

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5E5106

B.Tech. V Semester (Main/Back) Examination, Nov./Dec. - 2017

Computer Science

5CS6.1A Advanced Data Structure

CS, IT

Time : 3 Hours

Maximum Marks : 80

Min. Passing Marks : 26

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.*

Unit - I

1. Define Red-black trees. What is "big-oh" performance for the operation find Insert and Remove for a Red-black tree in best, worst & average cases. **(16)**

OR

1. a) Explain the operations on weighted balanced trees in detail. **(10)**

   b) Write short note on Dynamic order statistics. **(6)**

Unit - II

2. Explain the implementation of a binomial heap and its operations with suitable example in detail. **(16)**

OR

2. Explain Amortization analysis and potential function of fibonacci heap along with implementation of fibonacci heap. **(16)**

Unit - III

3. Explain following in contrast to Graphs

   a) Cut sets **(5)**

   b) Vertices Planar & Dual graphs **(5)**

   c) Spanning Trees **(6)**

OR

3. a) Write and explain single Min-cut Max-flow theorems in Network flows. **(8)**

b) Explain ford fulkerson max flow algorithm. **(8)**

Unit - IV

4. Explain the concept of priority queues and concatenable queues using 2-3 Trees along with suitable example. **(16)**

OR

4. a) Explain various operations on Disjoint sets and its union find problem. **(10)**

b) Write short note on zero-one example. **(6)**

Unit - V

5. a) Explain notation of elementary number theorem also explain Division theorem. **(10)**

b) Write short note on Chinese Reminder Theorem. **(6)**

OR

5. Write short notes on :

a) Primality testing & Integer factorization. **(8)**

b) Computation of Discrete logarithms. **(8)**