

1	<p>a) What you understand by Universal Hashing. How it is implemented in certain applications as a better data structure.</p> <p>b) Discuss the case of sparse matrices. How these are implemented using better data structure.</p>	4 4
2	<p>a) Explain the process of decrease key operation in Fibonacci heaps.</p> <p>b) Explain the process of decrease key operation in Binomial heaps.</p>	4 4
3	<p>a) Disjoint sets are a good data structures for various problems. How we represent disjoint sets using linked list representation. What improvements are made to make it more efficient?</p> <p>b) Write Bellman-Ford Algorithm for Single Source Shortest paths and explain with the help of an example.</p>	4 4
4	<p>AVL trees force certain amount of balancing in terms of retaining the maximum height of Binary search tree to a particular upper bound. What are the properties of AVL trees? How the height balancing is achieved. How rotations are performed. Discuss Insertions and deletions in an AVL tree. What are the complexities of these operations?</p>	8
5	<p>Knuth-Morris-Pratt algorithm is a linear time algorithm in terms of the length of the string from which we look for occurrence of a particular pattern. Explain the KMP strategy and write the KMP algorithm. Also workout an example with the KMP algorithm.</p>	8