

1	<p>Write short notes on the following</p> <ul style="list-style-type: none"> <li>a) Big Omega Notation</li> <li>b) Dynamic Programming</li> <li>c) Counting Sort</li> <li>d) Circular Doubly Linked Lists</li> </ul>
2	<ul style="list-style-type: none"> <li>a) What you understand by Fibonacci Heaps. How they are a better data structure than other counterparts. What is the amortized time complexity of various operations? Explain any two operations by taking an example.</li> <li>b) Write a program for heap sort using a binary tree and min heap structure.</li> </ul>
3	<ul style="list-style-type: none"> <li>a) Write an algorithm for the Knight Tour problem. You have an 8X8 chessboard and a knight which always moves two and a half move. Half move has to be in the 90 degree of the two moves direction. The knight is supposed to cover the whole board without repeating any of the position. The result should either show sequence of moves or should say that no such tour exists.</li> <li>b) Imagine four railroad cars positioned on the input side of the track numbered 1,2,3,4 respectively. Suppose we perform the following operations: move car 1 into stack, move 2 into stack, move 2 out, move 3 into stack, move 4 into stack, move 4 out, move 3 out, move 1 out. As a result the original order has been changed from 1234 to 2431. What permutations of the number 1,2,3,4 are possible that can be get using the above method? Input that permutation &amp; get the output as yes or no indicating it is possible or not.</li> </ul>
4	<ul style="list-style-type: none"> <li>a) Write an algorithm for checking that whether a given word is an anagram of another word. The word should have same length and same frequency of each letter occurring in the original word.</li> <li>b) Write a minimum spanning tree algorithm using kruskal approach for a given undirected graph.</li> </ul>
5	<p>Explain the following</p> <ul style="list-style-type: none"> <li>a) Knuth-Morris-Pratt Algorithm (KMP)</li> <li>b) All Pair Shortest Path Algorithm</li> <li>c) Union in Binomial Heaps</li> <li>d) Properties of Red-Black Tree</li> </ul>