

1	<p>Write Short Notes/Comments on the Following statements. Explain with proper arguments/examples wherever required</p> <ul style="list-style-type: none"> a) Bad Selection of data structure may render 'any tactical technique to improve your algorithm' useless b) Choice of Better data structure depends upon the fact that how fast access and modify operations can be done on the data c) Quick Sort is more cache friendly than few other sorting algorithms d) While inserting in a full array, Doubling of array is preferred than incrementing the array size by a constant. e) Union of two binomial heaps can be done in $O(\lg n)$ time
2	<ul style="list-style-type: none"> a) Discuss the Delete Min and consolidation operation in Fibonacci Heap Data Structure. Write all the steps involved with proper diagrams and examples. b) What is a heap data structure? Why heap data structure is preferred for priority queue. What are the reasons that it gives an optimized performance?
3	<ul style="list-style-type: none"> a) Why we use stable sorting algorithm as part of the radix sort algorithm to sort individual columns. b) How the randomization helps in the Quick Sort. c) Why Merge Sort is not suitable for small lists of numbers. d) In BST We replace the element to be deleted with its successor. Give the reason that it will not alter the basic properties of BST. e) Binary Search does not have any combine step of the divide and conquer strategy. Why?
4	<ul style="list-style-type: none"> a) Make a comparative study and analysis of four different data structures that can be used for representing graphs. b) Why we generally go for (i) macro analysis, (ii) worst case analysis, (iii) Asymptotic analysis and (iv) Posterior analysis (v) Big Theta Analysis