**Question Bank**

1. What is software and its characteristics?
2. What are asymptotic notations explain Big O and Big Omega notation with mathematical definitions?
3. How many ways a recurrence relation could be solve, explain master method?
4. Explain the algorithm of Bubble sort and its time and space complexity.
5. What is loop invariant?
6. Write algorithm for binary search, explain its time complexity.
7. Explain the merge sort algorithm with a suitable example.
8. Solve recurrence relation by substitution method

T(n) = T(n/2) + c if n > 1

1. if n = 1
2. Solve recurrence relation by master method

T(n) = 8T(n/2) + n^2 if n > 1

1. if n = 1
2. Solve recurrence relation by Substitution Method

T(n) = T(n-1) + n if n > 0

1 if n = 0

1. Explain Huffman coding.
2. What is MST which algorithm is used to find MST, explain any one of them.
3. Given the weights and profits of N items, in the form of {profit, weight} put these items in a knapsack of capacity W. What would be the maximum total profit in the knapsack?

arr = {{60, 10}, {100, 20}, {120, 30}}, W = 50

1. Make recursive tree for Fibonacci series { exa : Fib(7) )
2. How did you solve Fibonacci series problem using Dynamic Programming?
3. Solve 0/1 knapsack problem using Dynamic programming

Capacity = 4, profit[] = {1, 2, 3}, weight[] = {4, 5, 1}

1. Given array of coins of denominations Find min coin required to make change of V

coins[] = {25, 10, 5}, V = 30

(Use dynamic programming approach)

1. Explain Dijkstra’s Algorithm?
2. Explain the prim’s algorithm
3. Do the time and space complexity analysis for Quick Sort algorithm