Design and Analysis of Algorithm
DAA BT-CSE-Spz-Full Stack_AI-III_B1 H & B3 Non H (Aug-Jan 23)
Assignment -1   M.M: 50

Q1. Define Algorithm and its RAM model.   (4 Marks)

Q2. Explain the characteristics of an algorithm.   (4 Marks)

Q3. What do you understand by growth rate of functions and why asymptotic notations are important?   (4 Marks)

Q4. Find the Big(O) notation of the following functions: (3 Marks)

   (a) f(n) =$6n^3 + 2n + 6$ (b) f(n) = $2^n + 6n^2 + 3n$ (c) f(n)= $n^4 + 35n^2 + 84$

Q5. Find the Big(Ω) notation of the following functions: (3 Marks)

   (a) f(n) = $3^n + 6n^2 + 3n$ (b) f(n) =$5n^3 + n^2 + 3n + 2$ (c) f(n) $4 * 2^n + 3n$

Q6. Find the Ө - notation of the following functions: (2 Marks)

   (a) f(n)= $3 * 2^n + 4n^2 + 5n + 2$ (b) f(n) = $27n^2 + 16n$

Q7. Solve the recurrence relation using Master Theorem   (2 Marks)

   (a) T(n) = 4T(n/3) + n^2 (b) T(n)=100T(n/99)+log(n!)

Q8. Can the Master method be applied to solve recurrence T(n)=4T(n/2)+n^{2}logn ? Why or why not?   (2 Marks)

Q9. Apply the quick sort method on the following list   (5 Marks)
         A = {4,5,1,7,8,9,2,88}

Q11. Write an algorithm for merge sort and compute the complexity.   (5 Marks)

Q12. What is divide and conquer method explain with the help of an example. (4 Marks)

Q13. What is the optimal Huffman Code for the following set of frequencies based on first 8 fibonacci numbers?   (4 Marks)
      a:1 b:1 c:2 d:3 e:5 f:8 g:13 h:21

Q 14. Show how to solve fractional knapsack problem in Ө(n) time.   (4 marks)

Q15. Prove that the Algorithm GREEDY-ACTIVITY-SELECTOR produces solutions of maximum size for the activity-selection problem.   (4 Marks)