

(vi) Arrange the terms $n^3, \log n^3, 5n^2, 2^n$ in asymptotic order.

(vii) Construct a max heap tree with {A, L, G, O, R, I, T, H, M}

(viii) If A is an algorithm of $O(n^2)$, $n = 100000$, computer C is of speed 3.0 GHz find execution time of A in C . *3 GHz/sec*

(ix) Draw optimal tree with the weights 3, 5, 9, 2, 4, 10.

(x) What is NP hard problem.

2. (a) If $T(n) = 4T(\sqrt{n}/2) + (\log n)^2$ then find $O(T(n))$ 5

(b) Write the recursive algorithm to find max and min of n given numbers and discuss its time complexity. 5

3. (a) Discuss Graham's algorithm to find convex hull of a given set. 5

$$n^2 = (100000)^2$$
$$= 10^{10}$$
$$\frac{10^{10}}{3 \text{ GHz}} = \frac{10^{10}}{3 \times 10^9} = \frac{10}{3} = 3.33 \text{ sec}$$

(Travelling Salesperson problem)

(b) What is TVSP ? Discuss with a suitable example. 5

4. (a) Discuss Knapsack problem with $n = 5$, $m = 45$, $w = (20, 5, 10, 15, 7)$ $P = (18, 20, 30, 17, 14)$ 5

(b) Write the algorithm to solve magic square problem and test it with $n = 5$ 5

5. (a) Discuss Prim's algorithm to find spanning tree of a given graph with a suitable example. 5

(b) $X = \text{aabaababaa}$ $Y = \text{babaabab}$ find a minimum edit sequence that transfer X into Y . 5

6. (a) Discuss 8 queens problem. 5

(b) Write the algorithm to find Hamiltonian circle of a graph. 5

7. (a) Discuss dynamic programming with a suitable example. 5