

ANURAG Engineering College

(An Autonomous Institution)

II B.Tech II Semester Supplementary Examinations, June/July-2024

DESIGN AND ANALYSIS OF ALGORITHMS

(COMPUTER SCIENCE ENGINEERING)

Time: 3 Hours

Max. Marks: 75

Section – A (Short Answer type questions)

(25 Marks)

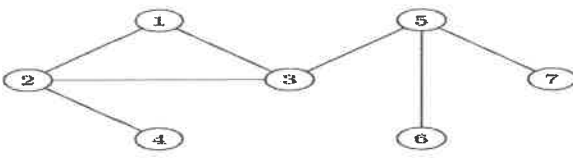
Answer All Questions

	Course Outcome	B.T Level	Marks
1. What are Disjoint set?	CO1	L1	2M
2. If $f(n)=5n^2+4n+3$ then prove that $f(n)$ is $O(n^2)$	CO1	L2	3M
3. Define minimum cost spanning tree?	CO2	L1	2M
4. Differentiate breath first search and depth first search?	CO2	L2	3M
5. Distinguish greedy method and dynamic programming?	CO3	L1	2M
6. Define 0/1 knapsack problem?	CO3	L2	3M
7. State the principle of Backtracking?	CO4	L1	2M
8. Define the state space tree.	CO4	L2	3M
9. Define NP-hard problem.	CO5	L1	2M
10. Draw comparison tree for sorting three elements.	CO5	L2	3M

Section B (Essay Questions)

Answer all questions, each question carries equal marks.

(5 X 10M = 50M)

11. A) Discuss various the asymptotic notation used for best case average case and worst case analysis of algorithms. CO1 L3 10M
- OR**
- B) Explain quick sort algorithm and simulate it for the following data: CO1 L3 10M
 20,35,10,16,54,21,26,67,75,87
12. A) List articulation points from the following graph. CO2 L3 10M
- 
- OR**
- B) Compute the optimal solution for job sequencing with deadlines using greedy method. $n=5$, $\{P1, P2, P3, P4, P5\} = \{20, 15, 10, 5, 3\}$ & $\{d1, d2, d3, d4, d5\} = \{2, 2, 1, 3, 3\}$. CO2 L3 10M
13. A) Construct OBST for $(a1,a2,a3,a4)=(do, if, int, while)$, $p(1:4)=(3,3,1,1)$ $q(0:4)=(2,3,1,1,1)$. CO3 L3 10M
- OR**
- B) Solve the solution for 0/1 knapsack problem using dynamic programming $n=3, m=6$ profit $(p1,p2,p3)=(1,2,5)$ and weights $(w1,w2,w3)=(2,3,4)$. CO3 L3 10M

14. A) Apply the backtracking algorithm to solve the following instances of sum of subset problem $S=\{5,10,12,13,15,18\}$ and $d=30$. CO4 L3 10M
- OR**
- B) Draw the portion of state space tree generated by LCBB for knapsack instance $n=4$ $(p_1,p_2,p_3,p_4)=(10, 10, 12, 18)$, $(w_1,w_2,w_3,w_4)=(2,4,6,9)$ and $m=15$. CO4 L3 10M
15. A) Distinguish NP-hard and NP-complete problems. CO5 L3 10M
- OR**
- B) Explain deterministic and non-deterministic algorithms. CO5 L3 10M