

PRAGATI ENGINEERING COLLEGE: SURAMPALEM
(AUTONOMOUS)
III B.Tech II Semester Regular/Supplementary Examinations, April - 2024

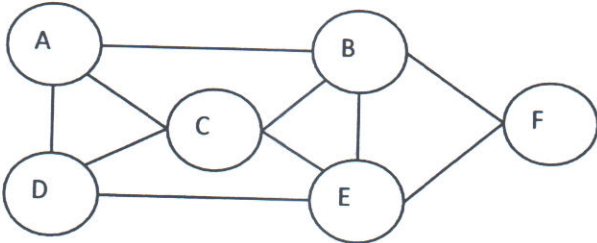
DESIGN AND ANALYSIS OF ALGORITHMS
(Common to CSE (AI&ML), CSE (DS) and CSE(AI))

Time: 3 hours

Max. Marks: 70 M

Answer ONE Question from each Unit
 All Questions Carry Equal Marks

Q. No.	Questions	BTL	CO	Marks
UNIT – I				
1.	a) Write an Algorithm using recursion that determines the LCM of two numbers. Determine the time and space complexity.	K4	CO1	7M
	b) Explain Towers of Hanoi problem using Recursion	K4	CO1	7M
OR				
2.	a) Show that the following equalities are incorrect i) $10n^2 + 9 = O(n)$ ii) $n^2 \log(n) = \theta(n^2)$	K4	CO1	7M
	b) Find the Time complexity of Iterative sum algorithm?	K4	CO1	7M
UNIT – II				
3.	a) Write an algorithm to Recursive Binary search	K3	CO2	7M
	b) Explain Quick sort algorithm and simulate it for the following data: 20, 35, 10, 16, 54, 21, 25	K3	CO2	7M
OR				
4.	a) Write an algorithm to generate Kruskal algorithm.	K3	CO2	7M
	b) Explain Kruskal algorithm with an example	K3	CO2	7M
UNIT – III				
5.	a) Write the multistage graph pseudocode corresponding to backward approach using Dynamic Programming.	K4	CO3	7M
	b) Calculate the shortest distance using all pairs shortest path algorithm	K4	CO3	7M

OR					
6.	a)	Show that the computing time of function Optimal Binary Search Tree is $O(n^2)$	K4	CO3	7M
	b)	Explain about Travelling Salesman problem	K4	CO3	7M
UNIT – IV					
7.	a)	Write an algorithm for N-Queens problem using Backtracking	K4	CO4	7M
	b)	Explain Recursive back tracking algorithm for sum of sub sets problem	K4	CO4	7M
OR					
8.	a)	Write the algorithm for finding all m-colorings of a graph	K3	CO4	7M
	b)	Find the Hamiltonian cycle in the following Graph		CO4	7M
UNIT – V					
9.	a)	Explain class P problems	K2	CO5	7M
	b)	Write about Fractional Knapsack Problem in P	K2	CO5	7M
OR					
10.	a)	Differentiate NP complete and NP hard	K2	CO5	7M
	b)	Explain Cook's Theorem	K2	CO5	7M