Course Code: **V20CST06** **V20** HTNO

SRI VASAVI ENGINEERING COLLEGE(Autonomous)

B.Tech IV SemesterRegular Examinations – July– 2022

DESIGN AND ANALYSIS OF ALGORITHMS

(Common to CSE, CST)

Time: 3:00 Hrs Max. Marks: 70Marks

Answer All the Questions.
Each Questions Carry Equal Marks

1.				**14 M**
	A.	i.	Define Algorithm. Explain Space complexity and Time complexity.	CO1-K2-(7M)
		ii.	Explain Algorithm to find the Maximum and Minimum using Divide and conquer approach.	CO1-K3-(7M)
			OR	
	B.	i.	Discuss the time complexity of Binary search algorithm for best and worst case.	CO1-K2-(7M)
		ii.	Define Big – O notation and briefly discuss with suitable example.	CO1-K3-(7M)
2.				**14 M**
	A.	i.	Define Minimum cost spanning tree. Explain Prim's algorithm for generating minimum cost spanning tree.	CO2-K2-(7M)
		ii.	Explain algorithm for Optimal Merge Patterns with an example.	CO2-K3-(7M)
			OR	
	B.	i.	Discuss Job – Sequencing with deadlines problem. Find an optimal sequence to the n=5 Jobs where profits (P1,P2,P3,P4,P5) = (20,15,10,5,1) and deadlines (d1,d2,d3,d4,d5) = (2,2,1,3,3).	CO2-K2-(7M)
		ii.	Solve the following instance of Knapsack problem using greedy approach n = 3 weights (W1, W2, W3) = (3, 5, 7) profits (P1, P2, P3) = (3, 7, 12) and knapsack size M = 10.	CO2-K3-(7M)
3.				**14 M**
	A.	i.	Discuss All – Pair Shortest Path problem. Explain the Floyd Warshall algorithm.	CO3-K2-(7M)
		ii.	Describe the Dynamic 0/1 Knapsack Problem. Find an optimal solution for the dynamic programming 0/1 knapsack instance for n=3, m=6, profits are (p1, p2, p3) = (1,2,5), weights are (w1,w2,w3)=(2,3,4).	CO3-K3-(7M)
			OR	
	B.	i.	Explain the optimal binary search trees with example	CO3-K2-(7M)
		ii.	Illustrate Bellman-Ford single source shortest path algorithm with an Example.	CO3-K3-(7M)
4.				**14 M**
	A.	i.	Explain the basic principle of Backtracking and list the applications of backtracking	CO4-K2-(7M)
		ii.	Explain Hamiltonian cycles with examples.	CO4-K3-(7M)
			OR	
	B.	i.	Define sum –of subsets problem. Find all sum of subsets for n=4, (w1, w2, w3, w4) = (11, 13, 24, 7) and M=31.	CO4-K2-(7M)
		ii.	Discuss the 4 – queen's problem. Draw the portion of the state space tree for n = 4 queens using backtracking algorithm.	CO4-K3-(7M)
5.				**14 M**
	A.	i.	Differentiate FIFO and Least Cost branch and bound (LCBB) solutions.	CO5-K2-(7M)
		ii.	Apply the branch-and- bound technique in solving the travelling salesman problem	CO5-K3-(7M)
			OR	
	B.	i.	Explain the class of P and NP with example	CO5-K2-(7M)
		ii.	Apply branch and bound to 0/1 knapsack problem and explain with example	CO5-K3-(7M)
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