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.	Explain recursive Merge sort algorithm and derive the time complexity.	CO1-K2-(7M)
		ii.	Illustrate Asymptotic notations with an example.	CO1-K3-(7M)
			OR	
	B.	i.	Explain Quick sort algorithm and analyse the algorithm for time complexity.	CO1-K2-(7M)
		ii.	Explain recursive functions with an example.	CO1-K3-(7M)
2.				**14 M**
	A.	i.	Discuss Greedy Knapsack problem. Find an optimal solution to the Knapsack instance n=3, knapsack size m=20, profit (P1, P2, P3) = (25, 24, 15) and weight (W1, W2, W3) = (18, 15, 10).	CO2-K2-(7M)
		ii.	Explain the greedy technique for solving the Job Sequencing problem with example.	CO2-K3-(7M)
			OR	
	B.	i.	Discuss the Dijkstra's single source shortest path algorithm and derive the time complexity of this algorithm.	CO2-K2-(7M)
		ii.	Define Minimum cost spanning tree? Explain Kruskal's algorithm for generating minimum cost spanning tree	CO2-K3-(7M)
3.				**14 M**
	A.	i.	Explain Reliability Design Problem with suitable example.	CO3-K2-(7M)
		ii.	Solve the knapsack problem by Dynamic Programming method n=6, profit (p1,p2,…p6) = (80, 55,25,15,10,5) weight (w1,w2,…w6)=(100,50,20,10,7,3) and knapsack m=165.	CO3-K3-(7M)
			OR	
	B.	i.	Describe the algorithm to find minimum-cost binary search tree and also discuss its time complexity.	CO3-K2-(7M)
		ii.	Explain Floyd–Warshall algorithm to find shortest path between all pairs of vertices	CO3-K3-(7M)
4.				**14 M**
	A.	i.	Solve the following instance using backtracking technique for the subset problem s=(1,3,4,5) and d=11.	CO4-K2-(7M)
		ii.	Illustrate 8-queens problem using back tracking	CO4-K3-(7M)
			OR	
	B.	i.	Explain Hamiltonian Cycle. Explain how to find Hamiltonian path and cycle using backtracking algorithm	CO4-K2-(7M)
		ii.	Illustrate graph colouring technique using back tracking	CO4-K3-(7M)
5.				**14 M**
	A.	i.	Explain the principles of Control Abstractions for LC-search.	CO5-K2-(7M)
		ii.	Define 0/1 knapsack problem and design an algorithm of LC Branch and Bound to find the solution for the knapsack instance with an example?	CO5-K3-(7M)
			OR	
	B.	i.	Explain the FIFO branch and bound solution with example	CO5-K2-(7M)
		ii.	Explain what are P, NP, NP- complete and NP-hard problems	CO5-K3-(7M)
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