O.P.Code: 20CS0523	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)

B.Tech III Year II Semester Regular Examinations August-2023

DESIGN AND ANALYSIS OF ALGORITHMS
(Common to CIC, CSM, CSE & CSIT)

Time: 3 Hours **Max. Marks: 60**

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1	a	Apply the Master's theorem to Solve the following Recurrence relations i) $T(n) = 4T(n/2) + n$ ii) $T(n) = 2T(n/2) + n\log n$	CO1	L3	6M
	b	Define disjoint set. Explain any four types of disjoint sets operations with Examples.	CO1	L2	6M

OR

2	a	What do you mean by algorithm? List some of the properties of it.	CO1	L1	4M
	b	Classify the rules of Pseudo code for Expressing Algorithms.	CO1	L2	8M

UNIT-II

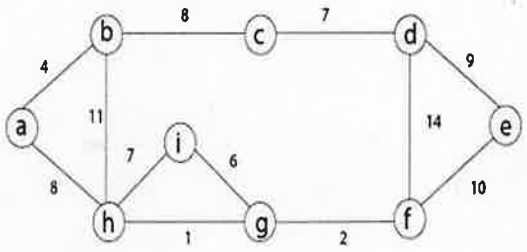
3	a	Compare between BFS and DFS techniques.	CO2	L4	6M
	b	What is divide and conquer strategy? Write briefly about general method and its algorithm.	CO2	L3	6M

OR

4		Summarize an algorithm for quick sort. Provide a complete analysis of quick sort for given set of numbers 12, 33, 23, 43, 44, 55, 64, 77and 76.	CO2	L2	12M

UNIT-III

5		Apply the minimum spanning tree of the following graph using Kruskals algorithm and prims algorithm.	CO3	L3	12M



OR

6	a	Simplify the algorithm for Knapsack problem and analyze time complexity.	CO3	L4	6M
	b	What is minimum cost spanning tree and write the algorithm of pseudo code for kruskals algorithm.	CO3	L3	6M

UNIT-IV

7	**a** Recall the graph coloring. Explain in detail about graph coloring with an example.	**CO4**	**L5**	**9M**
	b Discuss about General method of backtracking.	**CO4**	**L3**	**3M**

OR

8	Find the LC branch and bound solution for the traveling sale person problem whose cost matrix is as follows:	**CO4**	**L4**	**12M**

$$\begin{array}{c} \\ 1 \\ 2 \\ 3 \\ 4 \\ 5 \end{array} \begin{array}{c} \begin{array}{ccccc} 1 & 2 & 3 & 4 & 5 \end{array} \\ \begin{bmatrix} \infty & 20 & 30 & 10 & 11 \\ 15 & \infty & 16 & 4 & 2 \\ 3 & 5 & \infty & 2 & 4 \\ 19 & 6 & 18 & \infty & 3 \\ 16 & 4 & 7 & 16 & \infty \end{bmatrix} \end{array}$$

UNIT-V

9	Explain the following: i) decision problem ii) clique iii) non deterministic machine iv) satisfiability	**CO5**	**L4**	**12M**

OR

10	**a** Statement the following with examples i) Optimization problem ii) Decision problem	**CO5**	**L4**	**6M**
	b Explain and shows the relationship between P,NP,NP Hard and NP Complete with neat diagram.	**CO5**	**L3**	**6M**

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