R18

Reg. No:

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech III Year I Semester Regular Examinations Feb-2021
DESIGN AND ANALYSIS OF ALGORITHMS
(Common to CSE & CSIT)

Time: 3 hours   Max. Marks: 60

PART-A

(Answer all the Questions 5 x 2 = 10 Marks)

1	a	List out the steps that need to design an algorithm.	2M
	b	List out the formulas for Strassen's matrix multiplication.	2M
	c	What is Knapsack problem?	2M
	d	Define Branch-and-Bound method.	2M
	e	Define NP- hard problem.	2M

PART-B

(Answer all Five Units 5 x 10 = 50 Marks)

UNIT-I

2	a	What is asymptotic notation? Explain different types of notations with examples.	5M
	b	Illustrate an algorithm for (i) Finding factorial of n number (ii)Sum of n natural numbers.	5M

OR

3	a	Define disjoint sets. Explain different types of disjoint sets operations with examples?	5M
	b	Solve the following recurrence: i) $T(n)=7T(n/3) + n2$ ii) $T(n)=3T(n/2) + n$	5M

UNIT-II

4	a	Sort the records with the following index values in the ascending order using quick sort algorithm. 9, 7, 5, 11, 12, 2, 14, 3, 10, 6.	5M
	b	Write and explain the control abstraction for Divide and conquer.	5M

OR

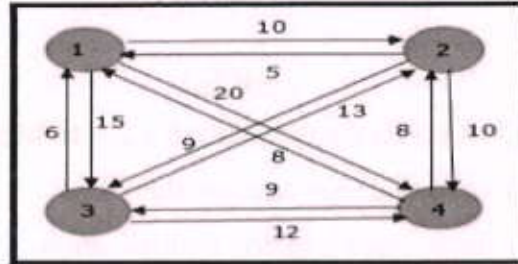|			
5		Explain the Strassen's algorithm for matrix multiplication and analyze time complexity.	10M

UNIT-III

6		Construct an optimal solution for Knapsack problem, where n=7, M=15 and $(p1,p2,p3,p4,p5,p6,p7)=(10,5,15,7,6,18,3)$ and $(w1,w2,w3,w4,w5,w6,w7)=(2,3,5,7,1,4,$	10M

1) by using Greedy strategy.

OR

7   Analyze the minimum cost tour forgiven problem using travelling sales   **10M**
     person Concepts.

UNIT-IV

8   a   Explain the principles of FIFO branch and bound.   **6M**

     b   Recall the graph coloring. Explain in detail graph coloring with an example.   **4M**

OR

9   a   Explain the properties of LC-search.   **5M**

     b   Give brief description about the general method of branch and bound.   **5M**

UNIT-V

10   Distinguish between deterministic and non-deterministic algorithms.   **10M**

OR

11   Determine the classes NP-hard and NP-complete problem with example.   **10M**

END