SRI SIDDHARTH INSTITUTE OF TECHNOLOGY, TUMKUR

(A constituent college of Sri Siddhartha Academy of Higher Education, Tumakuru)

CS4TH2: DESIGN AND ANALYSIS OF ALGORITHMS

Date:09/05/2022 **TEST 1** Time:1.00Hr

Max. Marks: 30

Answer all the questions

		M	C	B
1	Prove the following: i. $1/2 * n(n-1) \in \theta(n^2)$ ii. $100n + 5 \in O(n^2)$ iii. $n^3 \in \Omega(n^2)$	6	1	2
2	Write a non-recursive algorithm to find element uniqueness in an array. Find its efficiency.	6	3	2
3	What is exhaustive search? Describe travelling salesman problem with an example.	6	1	1
4	Write an algorithm to sort elements in an array using Selection sort. Give example.	6	2	2
5	Write a recursive algorithm to find Factorial of a given number. Find its efficiency.	6	3	2

Note: M: Marks, C: CO, B: Blooms Level

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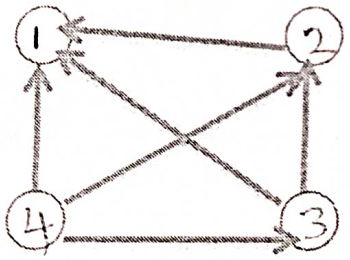
CS4TH2: Design and Analysis of Algorithms

Date: 06/06/2022 **TEST II** Time: 3.00 to 4.00pm

Max. Marks: 30

Answer all the questions.

Q.No		M	C	B
1	Write an efficient algorithm using divide and conquer design technique to sort the values in ascending order. Justify the same.	6	3	2
2	Obtain the recursive tree for maxmin algorithm for the following array. 10, -3, -7,0, 45, 69,6, 22, 39	6	4	3
3	Obtain the topological order for the given graph using DFS based algorithm and source removal technique.	6	4	3



4	Construct an AVL tree by inserting the elements successively starting with an empty tree for the following list 1,2,3,4,5,6	6	4	3
5	Design an algorithm to construct a heap from the elements of a given array by bottom-up approach.	6	3	2

Note: M:Marks, C:CO, B:Blooms Level

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CS4TH2: Design and Analysis of Algorithms

Date: 27/06/2022 **TEST III** Time: 3.00 to 4.00pm

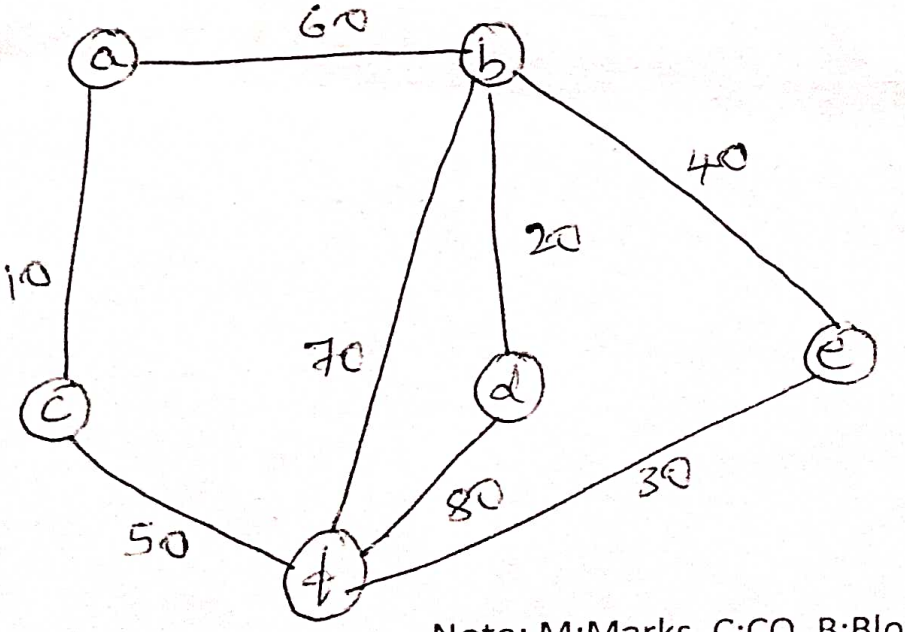
Max. Marks: 20

Answer all the questions.

Q.No		M	C	B
1	Apply Bottom-up dynamic programming technique to the following instance of the knapsack problem with capacity W=6	10	4	3

Item	Weight	Value
1	3	$25
2	2	$20
3	1	$15
4	4	$40
5	5	$50

2	Apply Prim's and kruskal's algorithm to find the MST for the following graph	10	4	3



Note: M:Marks, C:CO, B:Blooms Level