CRM08	Rev 1.16	CD	07/04/2025

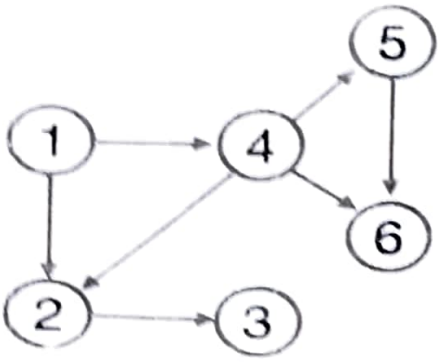
CONTINUOUS INTERNAL EVALUATION - 1

Dept: AI/CD/CS	Sem / Div: 4th A & B	Sub: **Analysis & Design of Algorithms**	S Code: **BCS401**
Date: 15/04/2025	Time: 9:30-11:00	Max Marks: 50	Elective: N

Note: Answer any 2 full questions, choosing one full question from each part.

QN		Questions	Marks	RBT	CO's
		PART A			
1	a	Define an Algorithm. With the help of a flowchart, explain the various steps in the algorithm design and analysis process.	10	L2	CO1
	b	Explain the general plan for analyzing time efficiency of recursive algorithm. Illustrate mathematical analysis of recursive algorithm for towers of Hanoi.	10	L2	CO1
	c	Construct an AVL tree for the list **1,2,3,4,5,6**	5	L3	CO3
		OR			
2	a	Write an algorithm to search a key using sequential search. Derive its time efficiency for best case, worst case and average case.	10	L2	CO1
	b	Explain asymptotic notations Big O, Big Ω and Big Θ that are used to compare the order of growth of algorithm with example.	10	L2	CO1
	c	Construct a 2-3 tree for the list **50, 60, 70, 40, 30, 20, 10, 80, 90, 100**	5	L3	CO3

PART B

3	a	What is topological sorting? Apply DFS and source removal method for below graph to solve topological sorting. 	10	L3	CO2
	b	Discuss merge sort algorithm for the following numbers **23, 12, 34,65,45, 99, 68, 80.** Also discuss its best-case, average-case and worst-case efficiency.	10	L2	CO2
	c	Construct heap using top-down (successive insertion) method for **3, 5, 2, 7, 1, 13, 11, 20, 16**	5	L3	CO3

OR

4	a	Write an algorithm to sort 'n' numbers using Quick sort. Trace the algorithm to sort the following list in ascending order **80 60 70 40 10 30 50 20**. Also write recursion tree.	10	L3	CO2
	b	Explain Divide and conquer & Decrease and conquer methods with block diagram. How time complexity is reduced with Stressen's Matrix Multiplication compared with normal matrix multiplication? Explain in brief.	10	L2	CO2
	c	Apply heap sort algorithm to sort the following numbers in ascending order: **2, 9, 7, 6, 5, 8**	5	L3	CO3

Prepared by: Ms. Roopa G K

HOD