Reg. No. : | | | | | | | | | | | | |

Question Paper Code: U1301

M.E. DEGREE EXAMINATION, DEC 2025

First Semester

Computer Science and Engineering

21PCS101– ADVANCED DATA STRUCTURES AND ALGORITHMS

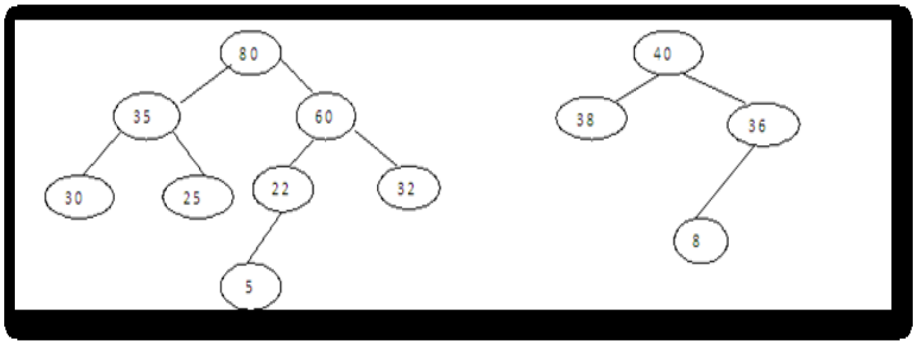
(Regulations 2021)

Duration: Three hours | Maximum: 100 Marks

Answer ALL Questions

PART - A (5 x 20 = 100 Marks)

1.	(a)	Construct a Binary Search Tree by inserting the following sequence of numbers 10, 12, 5, 4,20,8,7,15 and 13 and Write the procedure for insertion and Deletion operations.	CO2 - App	(20)
		Or		
	(b)	Consider a Trie rooted at node T that represents a set of character strings. Assume that characters are from the Roman alphabet and that the letters of the alphabet are encoded with numeric values between 1 and 26. Write an algorithm Print-Trie (T) that prints all the strings stored in the Trie.	CO2 - App	(20)
2.	(a)	(i) Merge the following leftist trees. (ii) Write the pseudo code for Merge, label and rotation operations for leftist heap.	CO2-App	(20)



Or

	(b)	Consider a Min-heap of inserting the following nodes 10,12,1,14,6,5,8,15,3,9,7,4,11,13 and 2 into an empty heap. Write the routines to do a percolate up and percolate down in a heap and also performs the operations Delete min, Decrease Key, Delete and Increase Key in the resultant heap.	CO2-App	(20)

3. (a) Perform the double hashing with the elements 8,26,37,51,11,18,22 with table size 10. CO2-App (20)

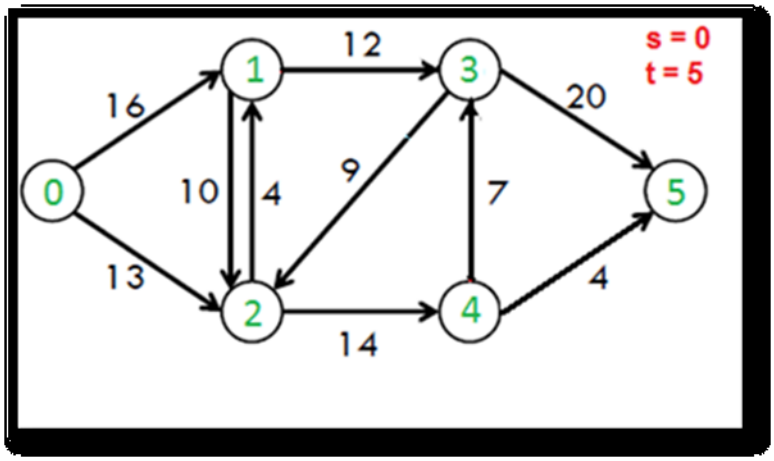
Or

(b) Construct the open hash table and close hash table for the input 30,20,56,75,31,19 using the hash function h(k)=k mod 9 . CO2-App (20)

4. (a) Consider a phone network design. You have a business with several offices; you want to lease phone lines to connect them up with each other; and the phone company charges different amounts of money to connect 7 pairs of cities. Find a set of lines that connects all your offices with a minimum total cost and explain the algorithm in detail. CO2-App (20)

Or

(b) Find out the Min Cut for following given problem. Write an algorithm to compute the minimum cut in the graph. CO2-App (20)



5. (a) Illustrate knapsack problem with one example using Greedy method? Discuss its time complexity. CO1-U (20)

Or

(b) Explain in detail Parallel algorithms with suitable Example. CO1-U (20)