Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

B.VOC- SEMESTER–II EXAMINATION – WINTER 2025

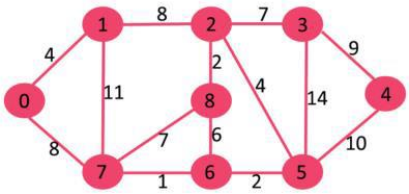
Subject Code:21120201 Date:27-11-2025

Subject Name: Data Structures

Time:02:30 PM to 04:30 PM Total Marks:50

Instructions:

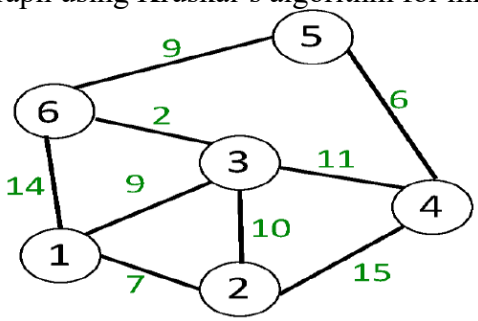
1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**

			Marks
Q.1	**(a)**	What is Asymptotic Notation? List and explain it. Differentiate between arrays and linked list.	**05**
	(b)	What is Array? How to declare and initialize 1D array? Explain with example.	**05**
Q.2	**(a)**	Write an algorithm to perform enqueue and dequeue operations in a simple queue.	**05**
	(b)	Evaluate the following postfix expression in tabular form showing stack after every step. 7 6 + 4 * 4 10 + - 5 +	**05**
		OR	
	(b)	Consider the following queue, where queue is a Circular queue having 6 memory cells. Front=2, Rear=4. Queue: _, H, I, J, _, _ Describe queue as following operation take place: a. K is added to the queue b. Two letters are deleted c. G is added to the queue d. S is added to the queue e. One letter is deleted	**05**
Q.3	**(a)**	Write an algorithm for Insert a node at beginning in a singly linked list.	**05**
	(b)	Create a Binary Search Tree for the following data and do in-order, Preorder and Post-order traversal of the tree. 40, 60, 15, 4, 30, 70, 65, 10, 95, 25	**05**
		OR	
Q.3	**(a)**	What is AVL tree? State the different rotations in AVL tree with examples.	**05**
	(b)	Define Binary Tree. Construct a binary tree from the traversals given below: In-order: E, A, C, K, F, H, D, B, G Pre-order: F, A, E, K, C, D, H, G, B	**05**
Q.4	**(a)**	What is searching? Explain binary search with example.	**05**
	(b)	Solve the following graph using Prim's algorithm for minimum spanning tree. 	**05**

OR

Q.4 **(a)** Explain collision resolution techniques in detail. **05**

(b) Solve the following graph using Kruskal's algorithm for minimum spanning tree. **05**



Q.5 **(a)** Explain different representations of graph. **05**

(b) Perform selection sort on the following data: **05**
50, 30, 70, 40, 80, 10

OR

Q.5 **(a)** Explain BFS and DFS traversal methods for Graph with suitable example. **05**

(b) Write the algorithm for quick sort and sort the following numbers according to it. **05**
25, 85, 60, 10, 58, 47, 35, 16, 72, 50

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