Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BVOC- SEMESTER–II EXAMINATION – WINTER 2022

Subject Code:21120201 Date:21-02-2023

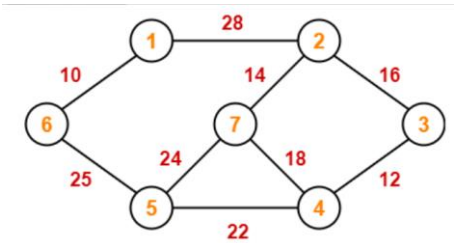
Subject Name:Data Structures

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)**	Define Algorithm. Explain it with example.	**05**
	(b)	What do you mean by Data Structure? Give the difference between Primitive and Non-primitive data structures.	**05**
Q.2	**(a)**	Define Queue. What are the benefits of circular queue over Queue?	**05**
	(b)	Consider the stack S of characters, where S is allocated 8 memory cells. S: A,C,D, F, K, _, _, _ Perform the following operations on stack. Pop(), Pop() ,Push(L), Push(P), Pop(), Push(R), Push (S), Pop()	**05**
		OR	
	(b)	Convert following Infix Expression into Postfix expression using stack. A ^ B * C - D + E / F / (G + H)	**05**
Q.3	**(a)**	What is Linked List? Explain types of it.	**05**
	(b)	Write an algorithm to perform enqueue and dequeue operations in a queue.	**05**
		OR	
Q.3	**(a)**	Differentiate between arrays and linked list.	**05**
	(b)	Write an algorithm to insert a node in a singly linked list.	**05**
Q.4	**(a)**	Define the following terms with respect to tree data structure: 1. Root node 2. Leaf node 3. Siblings 4. Complete binary tree 5. Degree	**05**
	(b)	Find its inorder, preorder and postorder traversal for the following data. 10,3,15,22,6,45,65,23,78,34,5	**05**
		OR	
Q.4	**(a)**	Explain various representations of graph.	**05**
	(b)	Solve the following graph using Prim's algorithm for minimum spanning tree .	**05**



Q.5	**(a)**	What is searching? Explain binary search with example.	**05**
	(b)	Explain the trace of bubble sort on following data. 42,23,74,11,65,58,94,36,99,87	**05**

OR

Q.5	**(a)**	Explain collision resolution techniques in detail.	**05**
	(b)	Perform insertion sort on the following data: 6, 7, 0, 9, 1, 2, 8, 5	**05**

****