Government College of Engineering, Ch. Sambhajinagar

(An Autonomous Institute of Government of Maharashtra)

End Semester Examination December 2023

F.Y. M.C.A. Examination

MCPCC1001:Data Structures

Time: 2 1/2 Hours 11 DEC 2023 ***Max. Marks: 60***

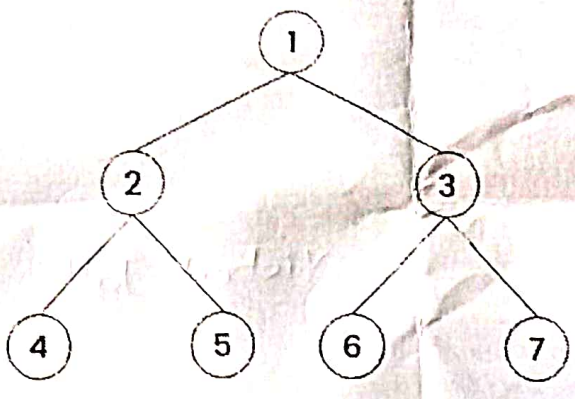
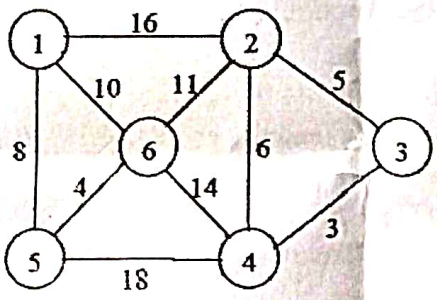
"Verify the Course Code and check whetheryou have got the Correct Question Paper"

Vishal Jatti

N.B.

1. ***Attempt all questions.***
2. ***Figures to the right indicate full marks***
3. ***Assume suitable data if necessary and state it clearly***
4. ***Use of Non-Programmable Calculator and Data Sheet is allowed***

Q1	**Attempt any Two**	***CO***	***Level***	***Marks***
	a. Apply push and pop operations to add and remove following data in the stack. Also define stack. add (2) add (50) add (20) remove two elementsfrom this stack.	***CO2***	***K3***	***06***
	b. Write an algorithm for evaluation of postfix expression.Convert the following expression into postfix form. **(A + B) * C - (D - E) * (F + G)**	***CO4***	***K5***	***06***
	c. Define data structures. Compare array based and linked list based stack implementation.	***CO1***	***K3***	***06***
Q2	**Attempt any Two**	***CO***	***Level***	***Marks***
	a. Which data structure is used for dictionary and spell checker? Justify your answer.	***CO4***	***K5***	***06***
	b. Compare singly linked list, doubly linked list and circular linked list. Write steps to implement insert and delete operations of linked list.	***CO1***	***K3***	***06***
	c. Compare between sequential search and binary search.Write an algorithm for binary search.	***CO2***	***K2***	***06***
Q3	**Attempt any Two**	***CO***	***Level***	***Marks***
	a. Write any two applications of binary tree. Create the binary search tree using following data. Search an element 11 from the given list. **43, 10, 79, 90, 12, 54, 11, 9, 50**	***CO2***	***K5***	***06***

	b. Traverse the following tree using preorder, postorder and inorder traversal methods.  	*CO3*	*K4*	*06*
	c. Explain AVL tree and B-tree with example.	*CO2*	*K2*	*06*
Q4	**Attempt any Two**	*CO*	*Level*	*Marks*
	a. Write an algorithm for merge sort and sort the following numbers with merge sort method. Analyze merge sort algorithm using time complexity. 23, 5, 67, 1, 20, 8	*CO4*	*K5*	*06*
	b. Compare sequential search and binary search.Search number 7 in the following list using binary search method. 23 4 12 5 4 7 9 15	*CO4*	*K3*	*06*
	c. Find minimum spanning tree with Prim's and Kruskal's algorithm for the following graph.  	*CO2*	*K4*	*06*
Q5	**Attempt any Two**	*CO*	*Level*	*Marks*
	a. Describe DFS and BFS methods. Write algorithm for BFS traversal.	*CO1*	*K3*	*06*

	b. Define a hash table. Explain it briefly.	*CO1*	*K2*	*06*
	c. What is collision resolution in hashing? Give names of searching and hashing algorithms each.	*CO3*	*K1*	*06*