Course Code: **23MCA1T04**

MALINENI LAKSHMAIAH WOMEN'S ENGINEERING COLLEGE
(AUTONOMOUS)
I-MCA I-Semester (MR23) Regular Examinations, March - 2024
DATA STRUCTURES

Time: 3 hours   Max. Marks: 70

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*Answer **ALL** the questions*

Q. No.		Question	Marks	CO	BL
1	a	Write an algorithm, flowchart and program to compute roots of a quadratic equation.	(7M)	CO1	L2
	b	Give the syntax of various loop control statements supported by C. Explain their execution behaviour with neat flowcharts.	(7M)	CO1	L2
(OR)					
2	a	Compare and contrast between if - else and switch – case statements with an example each	(7M)	CO1	L2
	b	Write a C program to check whether a given integer number is perfect number or not. the A perfect number is a positive integer number which is equals to sum of its proper positive divisors. For example 6 is a perfect number because its proper divisors are 1, 2, 3 and it's sum is equals to 6	(7M)	CO1	L1

Q. No.		Question	Marks	CO	BL
3	a	Explain the concept of structures and unions with suitable examples.	(7M)	CO2	L3
	b	How to pass arrays as parameters to functions? Explain with example.	7M)	CO2	L2
(OR)					
4	a	Write a C program to add two distances given as input in feet and inches using structures. (Hint: one feet = 12 inches)	(7M)	CO2	L2
	b	Write a program to read an input file and to create output file. Input file contains student records containing stud_no, stud_name, marks in 3 subjects. output file should contain stud_no, stud_name, marks in 3 subjects, total_marks average_marks and result for every record.	(7M)	CO2	L2

Q. No.		Question	Marks	CO	BL
5	a	Explain the importance of Recursive algorithms with an appropriate example. Specify the properties and conditions for implementing Recursion. Discuss the types of Recursion.	(7M)	CO3	L2
	b	With neat diagrams, explain the Insert and Delete operations in Circular Linked List data structure.	(7M)	CO3	L2
(OR)					

6	a	What are the limitations of Singly Linked Lists? How these limitations can be overcome in Circular and Doubly Linked lists? Explain.	(7M)	CO3	L3
	b	Describe all possible operations of Doubly Linked list with neat diagrams.	(7M)	CO3	L2

7	a	Define Stack. Write and explain linked list implementation of PUSH, POP and List functions of STACK.	(7M)	CO4	L3
	b	What is meant by Hashing in Data Structures? Discuss different types of Hash functions.	(7M)	CO4	L2
(OR)					
8	a	Define QUEUE. Write and Explain linked implementation of insert, delete and list functions of QUEUE.	(7M)	CO4	L3
	b	How collision can be resolved in hashing? Discuss different collision resolution techniques in hashing with suitable examples.	(7M)	CO4	L3

9	a	Explain the working principle of Exchange-Bubble sorting technique with an example.	(7M)	CO5	L1
	b	Construct a Binary Tree for the given Inorder and Postorder traversals by explaining the intermediate steps. Inorder Traversal is {4, 8, 2, 5, 1, 6, 3, 7} Post order Traversal is {8, 4, 5, 2, 6, 7, 3, 1}	(7M)	CO5	L3
(OR)					
10	a	Explain the step by step procedure of Selection Sort method for sorting the following unordered list of elements 14, 23, 32, 43, 65, 2, 54, 87, 75.	(5M)	CO5	L4
	b	Write the properties of Binary Search Tree. And demonstrate the procedure for Inserting and Deleting elements in a Binary Search Tree.	(5M)	CO5	L3

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MODEL QUESTION PAPER