

MID SEMESTER EXAMINATION 2022

Name of the Program: ECE

Semester: IV

Name of the Course: Data Structures

Course Code: TCS-410

Time: 1-1/2 Hour

Maximum Marks: 50

Note:

- i. Answer **all the questions** by choosing *any one of the subquestions*.
- ii. Each question carries 10 marks.

Q1	(10 Marks)	Specify CO/Cos
(a)	Explain Data Structure. How many types of Data Structures are there? Explain with examples.	CO-1
OR		
(b)	Define Array. Write a program in C to insert and delete an element from an Array.	
Q2	(10 Marks)	CO-1
(a)	Define the following terms in brief: (i) Time complexity (ii) Asymptotic Notation (iii) Space complexity (iv) Big O Notation	
OR		
(b)	Evaluate this expression using STACK $2 * (5 * (3 + 6)) / 5 - 2$	
Q3	(10 Marks)	CO-2
(a)	Write algorithm for Push and Pop operations in stack. Transform the following expression into its equivalent postfix expression using stack: $A + (B * C - (D / E \uparrow F) * G) * H$	
OR		
(b)	Discuss array and linked representation of queue data structure. What is dequeue?	
Q4	(10 Marks)	CO-2
(a)	Write a menu driven program of a stack using array having the push, pop and display operations [without taking global variables].	
OR		
(b)	Given a single linked list.	

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Q5	(10 Marks)	CO-2
(a)	How dynamic data structure is different from static data structure? Explain Linked list as a dynamic data structure. Explain search, insertion and deletion operation from a linear linked list.	
OR		
(b)	What is doubly linked list? What are its applications? Explain how an element can be deleted from doubly linked list using C program	