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Sixth Semester B.E./B.Tech. Degree Examination, June/July 2025
Introduction to Data Structures

Time: 3 hrs.

Max. Marks: 100

*Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.**2. M : Marks , L: Bloom's level , C: Course outcomes.*

Module – 1			M	L	C
Q.1	a.	Define an array. Explain how to declare and initialize one and two dimensional array with syntax and example.	10	L2	CO1
	b.	Write a C program to multiply 2 matrices A and B and display the resultant matrix C.	10	L3	CO1
OR					
Q.2	a.	Differentiate between static and dynamic memory allocation. Discuss four dynamic memory allocation function with syntax and example.	10	L4	CO1
	b.	Differentiate between structure and Union with syntax and example.	06	L2	CO1
	c.	Write a C program to swap two numbers.	04	L4	CO1
Module – 2					
Q.3	a.	Define stack. Write a C program to implement different operations of stack.	10	L2	CO2
	b.	Define Queue. Write a C function for the following. i) Insert an item from rear end ii) Delete from front end iii) Display the content of Queue.	10	L2	CO2
OR					
Q.4	a.	What is double ended Queue? Write a C function for the following i) Insert an item from front end. ii) Delete an item from rear end. iii) Display the content of a Queue.	10	L3	CO2
	b.	What are the disadvantages of Stack and Queue	05	L1	CO2
	c.	Write C function to perform the following operations on a circular Queue. i) Insert on item from rear end ii) Delete an item from front end.	05	L2	CO2
Module – 3					
Q.5	a.	What is singly linked list? Explain with its syntax and pictorial representation.	08	L2	CO3
	b.	What is getnode() and freenode() functions. Explain with example.	04	L2	CO3
	c.	Write a C program to create a list and display the contents of list.	08	L3	CO3
OR					
Q.6	a.	Write a C program to implement STACK using singly linked list.	10	L3	CO3
	b.	Write a C function for the following using circular singly linked list. i) Insert an item at the front end of list. ii) Delete an item from front end.	10	L3	CO3

Module – 4

Q.7	a.	What is a binary tree? With suitable example define. i) Root node ii) Ancestors iii) Descendents iv) Leaf node	08	L1	CO4
	b.	Construct a binary tree and find 3 order traversal of tree. 15, 20, 8, 27, 11, 2, 12, 6, 3, 10, 7, 22, 30	12	L3	CO4

OR

Q.8	a.	Write a C function to find the maximum item in Binary search tree.	06	L3	CO4
	b.	Define expression tree. Construct the expression tree. $((6+(3-2) * 5) \wedge (2+3))$	08	L2	CO4
	c.	With example, explain strictly binary tree and complete binary tree.	06	L2	CO4

Module – 5

Q.9	a.	Define sorting. Develop a C program to sort a list of elements in an ascending order by using selection sort technique.	10	L3	CO5
	b.	Write a C program to implement Bubble Sort technique.	10	L3	CO5

OR

Q.10	a.	Define searching. Write a C program to search an item using Linear search.	10	L3	CO5
	b.	Write a C program to search an item using Binary Search and mention the time complexity of algorithm.	10	L3	CO5
