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PRN No.		PAPER CODE	U124-371

May 2024 (ENDSEM) EXAM

F.Y.B. TECH. (SEMESTER - II)

COURSE NAME: FUNDAMENTALS OF DATA STRUCTURES **BRANCH:CSE(IoTCSBT)** **COURSE CODE: CI12235**

(PATTERN 2023)

Time: [1Hr. 30 Min] **[Max. Marks: 40]**

(*) Instructions to candidates:

1) **Figures to the right indicate full marks.**
2) **Use of scientific calculator is allowed**
3) **Use suitable data wherever required**
4) **All questions are compulsory. Solve any one sub question from each Question 1 and 2 and any three sub questions each from Questions 3 and 4.**

Q. No.	Question Description	Max. Marks	CO mapped	BT Level
Q.1	a) Interpret the statement "the algorithm has O(n^2) time complexity".	[5]	CO1	[2]
	b) What is ADT? List three examples of ADTs.	[5]	CO1	[2]
Q2	a) Identify the difference between row-major and column-major order in multidimensional arrays.	[5]	CO2	[2]
	b)Write code to traverse a single linked list and print its elements in reverse order.	[5]	CO2	[3]
Q.3	a) Demonstrate with a pseudo-code how a stack can be implemented using an array	[5]	CO3	[3]
	b) Convert infix expression to postfix expression: ((A – (B+C) * D) / (E+F)) using stack.	[5]	CO3	[3]
	c) Write an pseudo-code to enqueue and dequeue an element from circular queue. Check Qfull and Qempty condition	[5]	CO3	[3]
	d) Compare and contrast the use of arrays and linked lists in implementing a queue. What are the implications for performance in each case?	[5]	CO3	[3]
Q.4	a) If we need t seconds to do a binary search in an array of n numbers, how much time do we need in order to do a search in an array of n2 numbers?	[5]	CO4	[4]
	b) Find the expected number of passes, comparison and exchange for bubble sort when the given sequence is as follows.[7, 1, 3, 4, 10, 9, 8, 6, 5, 25]	[5]	CO4	[3]

	c) Sort the following array. [24, 9, 3, 48, 61, 2, 19, 55, 7, 21] Using Insertion sort.	[5]	CO4	[3]
	d) Compare and contrast the worst-case scenarios for quick sort and merge sort.	[5]	CO4	[4]

[BT level 1. Remember 2. Understand 3. Apply 4. Analyze 5. Evaluate 6. Create]