Total No. of Questions – [04]

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PRN No.	

PAPER CODE	V124-354

May 2024 (ENDSEM) EXAM

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

COURSE NAME: FUNDAMENTALS OF DATA STRUCTURES **Branch: COMPUTER SCIENCE & ENGG (AIML)** **COURSE CODE: CM12234**

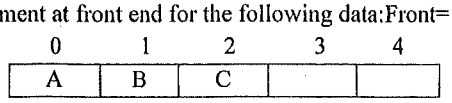
(PATTERN 2023)

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) Explain Row major and column major address calculation for two dimensional array	[5]	1	2
	b) Design an algorithm to delete an element from an array. If 15 element deleted from A = [12, 14, 15, 17, 18] .	[5]	1	2
Q2	a) Translate the given infix string to prefix expression and show the details of stack at each step (A- B/C) * (D*E-F).	[5]	2	3
	b) Design an algorithm to insert and delete an element into stack with suitable example.	[5]	2	3
Q.3	a) Consider the following queue, where queue is a circular queue having 6 memory cells. Front =2, rear = 4. Queue = _, A, C, D, _, _. Show the value of queue for the following operation take place: i) F is added to queue ii) Two letters are deleted iii) R is added to the queue iv) S is added to the queue v) One letter is deleted.	[5]	3	3
	b) Derive a pseudocode for dequeue at front operation in double ended queue for the following queue having 5 memory size. 0 1 2 3 4 | | | -2 | 1 | 9 | Front Rear	[5]	3	3
	c) Consider the linear queue for following characters having memory size of 5 where front = 2, rear = 3. Show the insertion at rear end in the queue. 0 1 2 3 4 | | | R | S | | Front Rear	[5]	3	3

	d) Make use of double ended queue mention all the cases involved to insert an element at front end for the following data:Front= 0, Rear= 2  	[5]	3	3
Q.4	a) Sort the following data using Merge sort and determine time complexity: 18. 13, 12, 22, 15, 24, 10, 16, 19, 14, 30.	[5]	4	3
	b) Find the position of element 30 using linear search algorithm in given sequence.10, 5, 20, 25, 8, 30, 40.	[5]	4	3
	c) Develop an algorithm for iterative binary search to find H from the given list: B, F, D, A, C, E, I G, H, J.	[5]	4	3
	d) Sort the following using Radix sort: 7, 103, 15, 10, 3, 25, 28, 67, 304, 36, 49, 84.	[5]	4	3

Note: [BT Level – 1. Remember, 2. Understand, 3. Apply, 4. Analyze, 5. Evaluate, 6. Create]