Total No. of Printed Pages: 02

PRN No.	

PAPER CODE	U124-3103

May 2024 (ENDSEM) EXAM

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

COURSE NAME:Fundamentals of Data structures **Branch:I.T** **COURSE CODE: IT12233**

(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) What is the fundamental difference between data, data objects, and data structures?	[5]	[1]	[1]
	b) Define Abstract Data Types (ADTs) and provide examples of commonly used ADTs.	[5]	[1]	[1]
Q2	a)Write an algorithm for binary search and explain its analysis	[5]	[2]	[3]
	b) 64, 25, 12, 22, 11 ,39,40, 13 Solve using Selection Sort. Show all passes	[5]	[2]	[3]
Q.3	a) Write algorithm for addition of 2 sparse matrices. What is its complexity? Add the following two sparse matrices . Matrix 1: 4 3 4 0 0 5 0 2 8 1 1 5 3 1 9 and Matrix 2: 4 3 5 0 1 7 1 1 8 1 2 9 2 2 5 3 0 2	[5]	[3]	[3]
	b) Write a pseudo C algorithm for addition of two polynomials of two variable. Write suitable example.	[5]	[3]	[3]

	c) Write a C program to create a singly linked list and split it at the middle, and make the second half as the first half and vice versa, display the final list. Give example. d) Write an algorithm and explain with example, the procedure for deleting a linked list node from specific position in a doubly linked list.	[5] [5]	[3] [3]	[3] [3]
Q.4	a) How Infix expression is converted to Postfix Conversion using Stack? Explain with example. b) Convert infix to prefix. Show stack contents. (A+B)*C-D*F+C c) Write a pseudo code to implement linear queue using array to perform the following operations: · Addition of elements to queue. · Deletion of element from queue. · Display front element. · Display rear element. d) For a doubly ended queue: __, __, __, 10, 11, 12, 13, __, __, __. Front=3 rear=6 What will be the output after operations: Enque_front(9); Enque_rear(14); Enque_rear(15); Deque_front(); Deque_front(); Enque_rear(18);	[5] [5] [5] [5]	[4] [4] [4] [4]	[3] [3] [3] [3]

Notes:

[BT LEVELS: 1: REMEMBER 2: UNDERSTAND 3: APPLY 4: ANALYZE 5: EVALUATE 6: CREATE]