Total No. of Questions – [2]

Total No. of Printed Pages: 02

G.R. No.	

PAPER CODE	U124-3103

March 2024 (INSEM) EXAM

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

COURSE NAME: Fundamentals of Data Structures

BRANCH: IT

COURSE CODE: IT12233

(PATTERN 2023)

Time: [40 min]

[Max.Marks: 20]

(*) 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) **Solve any two sub questions from Question 1 and 2**

Question No.	Question Description	Marks	CO mapped	Blooms Taxonomy Level

Q.1	a) Use asymptotic notations to Calculate time and space complexity for following code: Consider all three cases of asymptotic notations.
	function fibonacci(n) {
	let x = 0, y = 1, z;
	if (n === 0) {
	return x;
	}
	if (n === 1) {
	return y;
	}
	for (let i = 2; i <= n; ++i) {
	z = x + y;
	x = y;
	y = z;
	}
	return z;
	}
		[5]	[1]	[4]

	b) Construct the graphs for asymptotic notations and	[5]	[1]	[2]

	explain the same in brief. c) Create ADT, set: Create, Insert, Remove, IsIn, Union, Intersection, Difference. Create ADT, Bag: Create, Insert, Remove, IsIn	[5]	[1]	[3]
Q2	a) Apply binary search algorithm on following numbers – 10,14,19,26,27,31,33,35,42,44. Also write complexity analysis of the algorithm.	[5]	[2]	[3]
	b) Sort the given numbers pass-wise using quick sort and comment on it's best, worst and average case complexity. 78, 21,14,97,87,62,74,85,76,45,84,22	[5]	[2]	[3]
	c)Write Pseudo code for Insertion sort. State its best, worst and average case complexity	[5]	[2]	[2]

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