	Reg. No.:	
	Name :	

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TERM END EXAMINATIONS (TEE) – May, 2023

Programme	:	**B.Tech.(All Branch)**	**Semester**	:	**Summer 2022-23**
Course Name	:	**Differential & Difference Equation**	**Course Code**	:	**MAT2001**
Faculty Name	:	**Dr. Rabia Musheer**	**Slot**	:	**C11-C15**
Time	:	**1½ hours**	**Max. Marks**	:	**50**

Answer ALL the Questions

Q. No.		Question Description	Marks
		PART - A (30 Marks)	
1	(a)	Solve the simultaneous differential equation by using matrix method $\frac{dy_1}{dx} = 2y_1 + 2y_2 + y_3$; $\frac{dy_2}{dx} = 1y_1 + 3y_2 + 1y_3$ $\frac{dy_3}{dx} = y_1 + 2y_2 + 2y_3$	10
		OR	
	(b)	Find the Fourier Sine and cosine series of the below function and draw the graph for each case: $f(x) = x^2 \qquad 0 < x < \pi$	10
2	(a)	Determine the distribution of temperature in the rod of length l, if both end maintained at zero temperature and the initial distribution of temperature is e^{-3x}, by using Fourier sine transform.	10
		OR	
	(b)	Find the Fourier Cosine Transform and Sine Transforms of $f(x) = \frac{x(e^{-7x} - e^{-2x})}{e^{\pi} - e^{-\pi}}$	10
3	(a)	Find the Inverse Z Transformation of the following function $F(z) = \frac{(z^2+5z+1)z}{(z-1)^4}$	10
		OR	
	(b)	Solve the below difference equation by using Z- transform: $y_{n+2} - 6y_{n+1} + 9y_n = 5^n$ with the condition $y_0 = 0, y_1 = 1$.	10

PART - B (20 Marks)		
4	Find the Fourier series of function $f(x) = x \quad for \quad -1 < x \leq 0$ $= x + 2 \quad for \quad 0 < x \leq 1$ Hence find the sum of the given series: $1 - \frac{1}{3} + \frac{1}{5} - \frac{1}{7} + \cdots$	10
5	Solve the difference equation using C.F. and P.I. method: $y_{n+2} - 2y_{n+1} + y_n = 5^n + 3n + 3.$	10
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