

Reg. No.:

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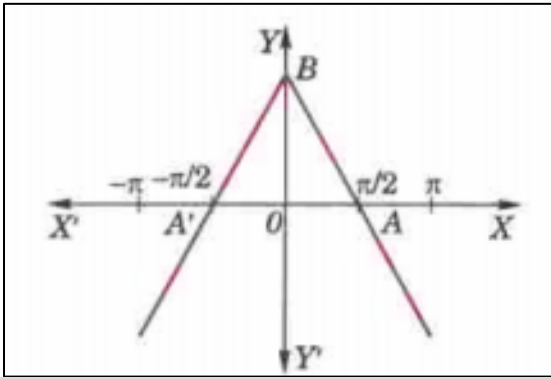
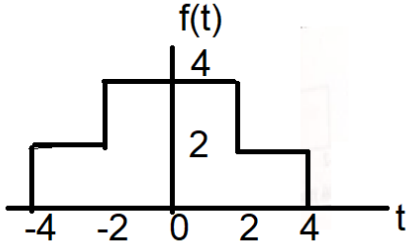


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TERM END EXAMINATIONS (TEE) – May 2023

Programme	: B.Tech. (All Branches)	Semester	: Summer 2022-23
Course	: Differential and Difference Equations / MAT2001	Slot	: A11+A12+A13+A14+A15
Time	: 1 ½ hours	Max. Marks	: 50

Answer all the Questions

Q.No.	Sub. Sec.	Question Description	Marks
		PART - A (30 Marks)	
1.	a)	<p>If A is the coefficient matrix of the given homogeneous system of equations. $3x + y + 4z = 0$; $2y + 6z = 0$; $5z = 0$ then find the eigen values and eigen vectors of</p> <p>I) A II) A^{-1} III) A^2 IV) $adj A$</p>	10
		OR	
	b)	<p>Obtain Fourier Series of the given periodic curve and show.</p> $\frac{1}{1^2} + \frac{1}{3^2} + \frac{1}{5^2} + \dots = \frac{\pi^2}{8}$ 	10
2	a)	<p>Determine the Fourier transform of the given signal depicted in the figure below</p> 	10
		OR	

	b)	Determine f_0, f_1, f_2 when $Z\{f(n)\} = F(z)$ is as given below $\frac{(z-1)^2(z+2)}{(z+3)(z+5)^2}$.	10
3	a)	<p>I) Find the Z Transform for the sum of two exponential</p> $f[n] = \left(\frac{1}{2}\right)^n u[n] + \left(-\frac{1}{3}\right)^n u[n],$ <p>where $u[n]$ is unit step function.</p> <p>II) Find inverse Z- Transform of $\frac{az}{(z-a)^5} + \frac{bz}{(z-b)^4}$</p>	5
		OR	
	b)	Using Z transform solve the following difference equation $y_{n+2} + y_n = 6$ with $y_0 = y_1 = 0$.	10
		PART - B (20 Marks)	
4		Solve given system of differential equations $\frac{dx}{dt} = 2x + y$ and $\frac{dy}{dt} = 3x + 4y$ at $x(0) = 2, y(0) = 2$ by Eigen value Method.	10
5		Using method of undetermined coefficient to solve the following difference equation $y_{n+2} + 4y_{n+1} + 3y_n = 5^n$ at $y_0 = 0$ & $y_1 = 1$.	10