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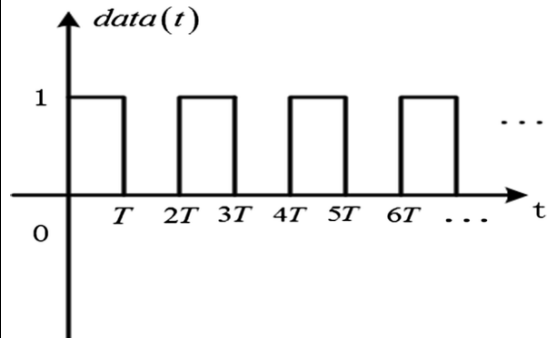
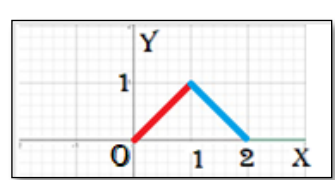


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Mid Term Examinations, Winter Inter II / Summer 2022-23

Programme	: B.Tech.	Semester	: Summer, 2022-23
Course	: Differential and Difference Equations	Code	: MAT2001
Time	: 1 ½ hours	Max. Marks	: 50

Answer all the Questions

Q.No.	Question Description	Marks
1	Verify the coefficient matrix of the following system of equations is diagonalizable or not. $6x - 2y + 2z = 0, -2x + 3y - z, 2x - y + 3z = 0$.	10
2	Solve the following differential equation by using eigen value method, $\frac{dX}{dt} = \begin{bmatrix} 2 & 2 & 1 \\ 1 & 3 & 1 \\ 1 & 2 & 2 \end{bmatrix} X$ with $X(0) = \begin{bmatrix} 1 \\ 0 \\ 0 \end{bmatrix}$.	10
3	Obtain trigonometric Fourier series of following the following periodic signal 	10
4	Obtain a half-range cosine series for $f(x) = \begin{cases} lx, & \text{for } 0 \leq x \leq \frac{a}{2} \\ l(b+x), & \text{for } \frac{a}{2} \leq x \leq a. \end{cases}$	10
5	Find Fourier cosine transform of the given curve 	10