COLLEGE OF ENGINEERING AND TECHNOLOGIES
ALMUSTAQBAL UNIVERSITY

Digital Signal Processing (DSP)

CTE 306

Lecture 6

- Discrete Time Signals -

(2023 - 2024)

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Lecturer / Researcher

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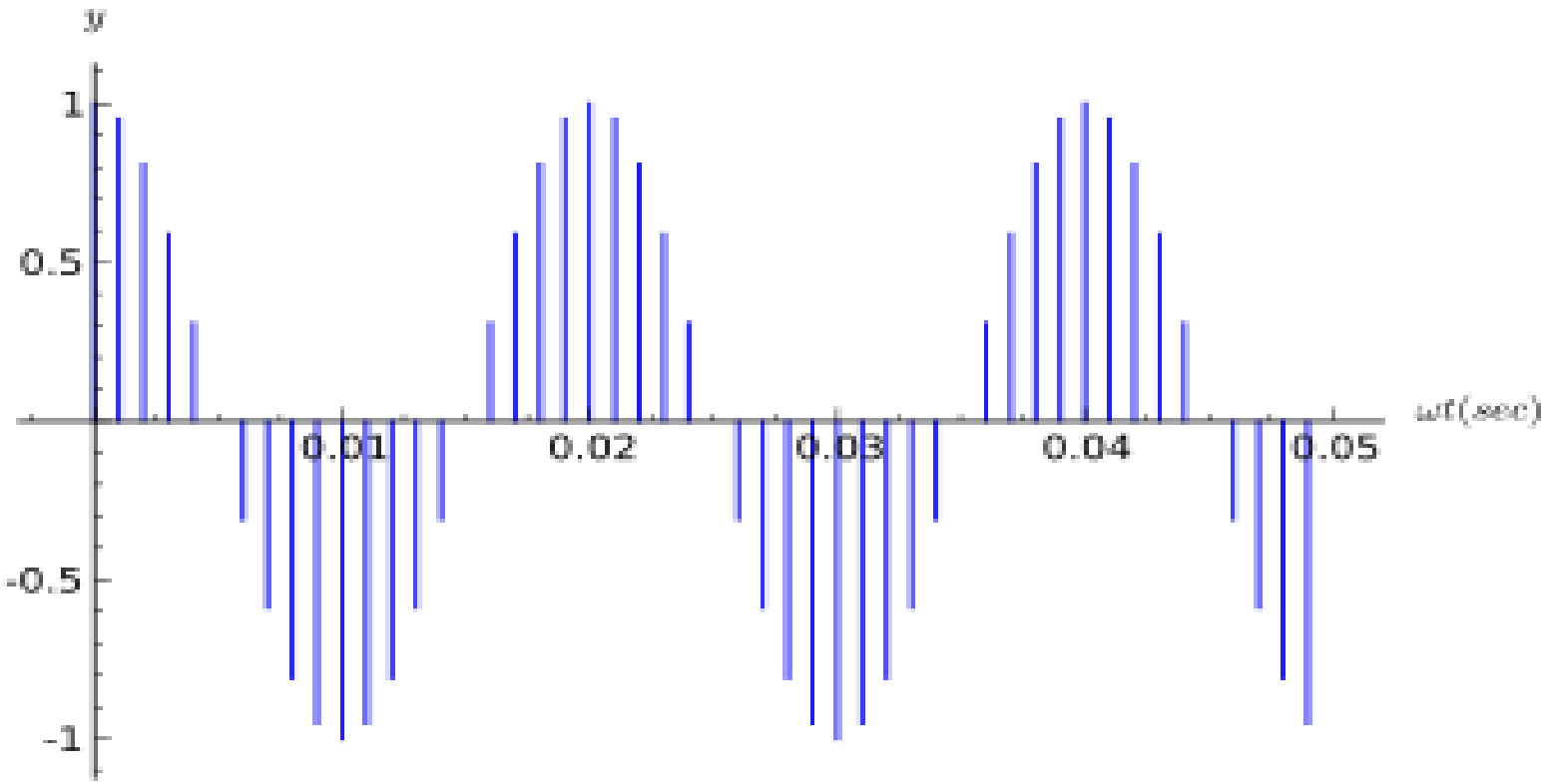
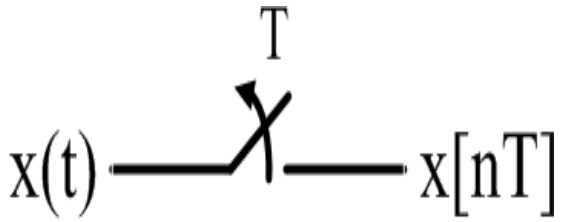
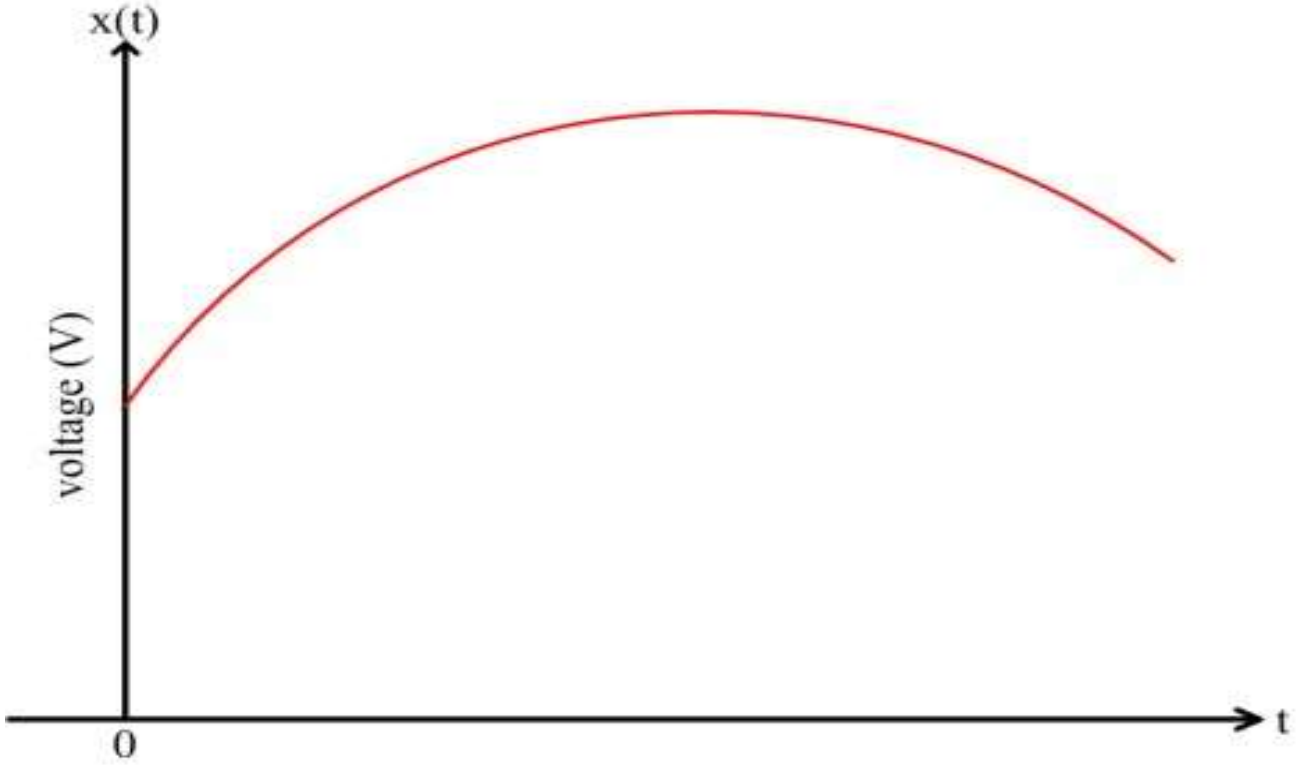
Discrete Time Signals



Sampling Process





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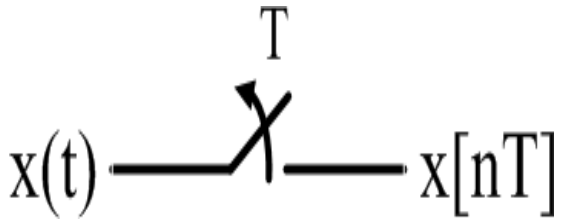

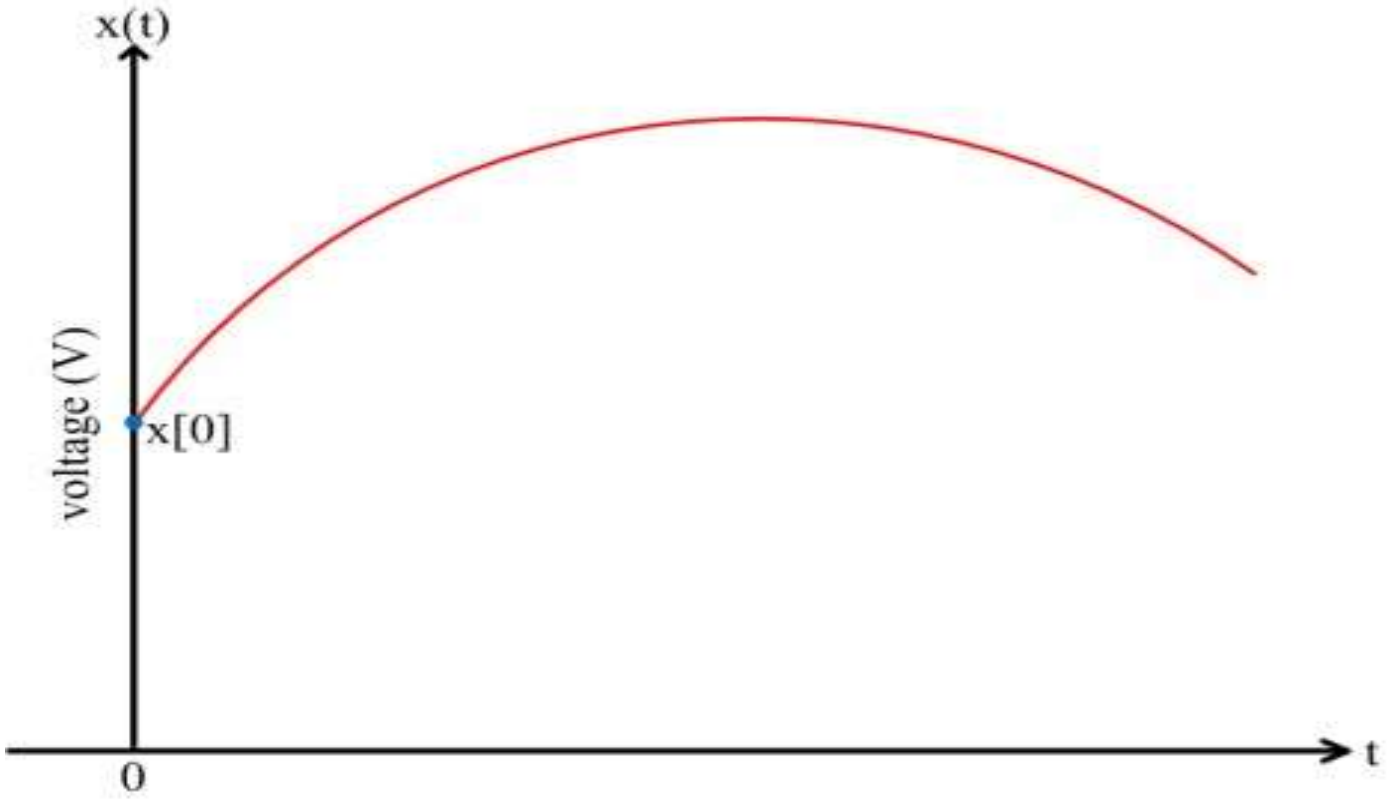

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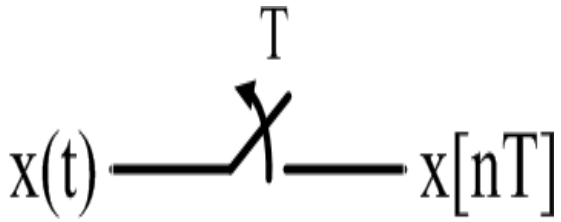
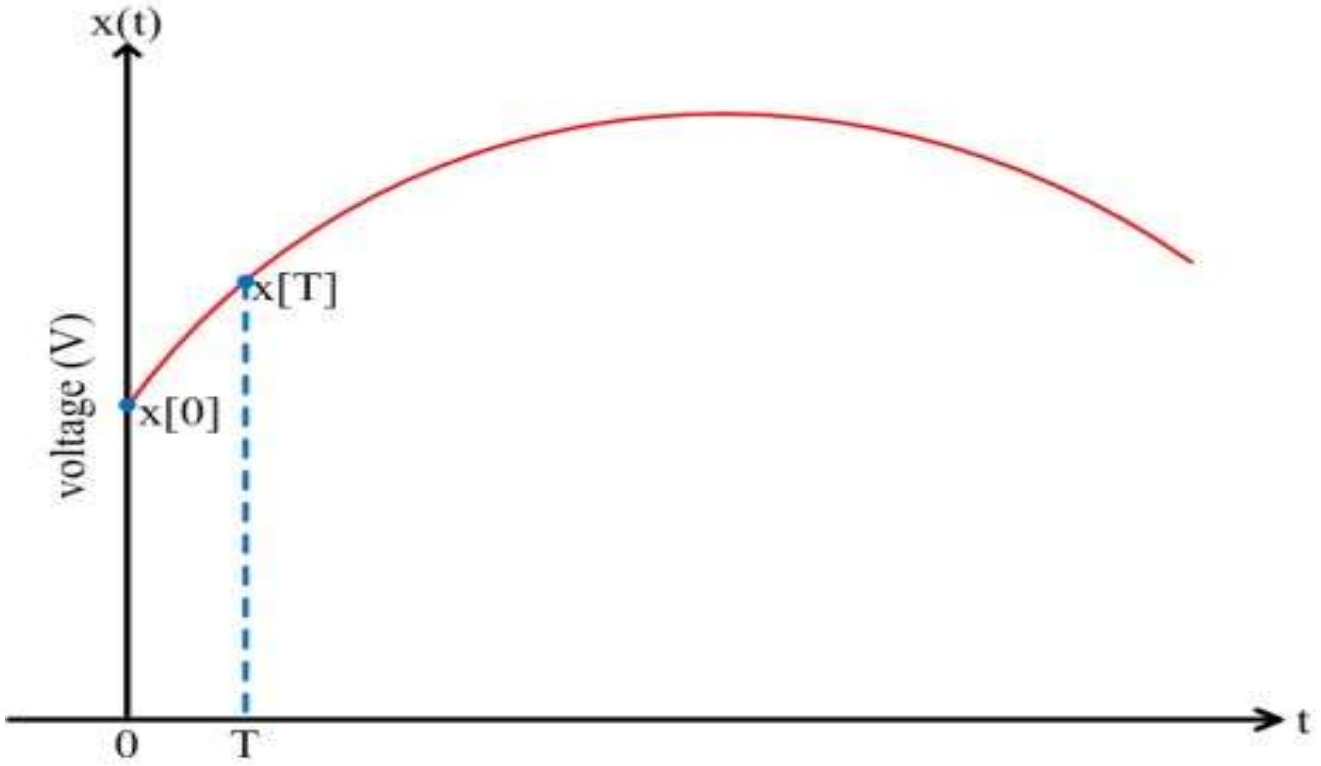
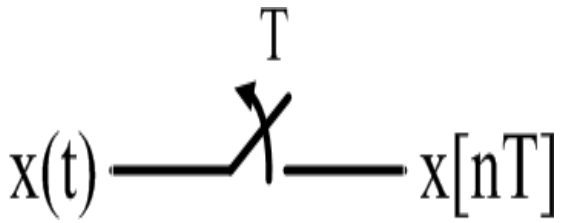
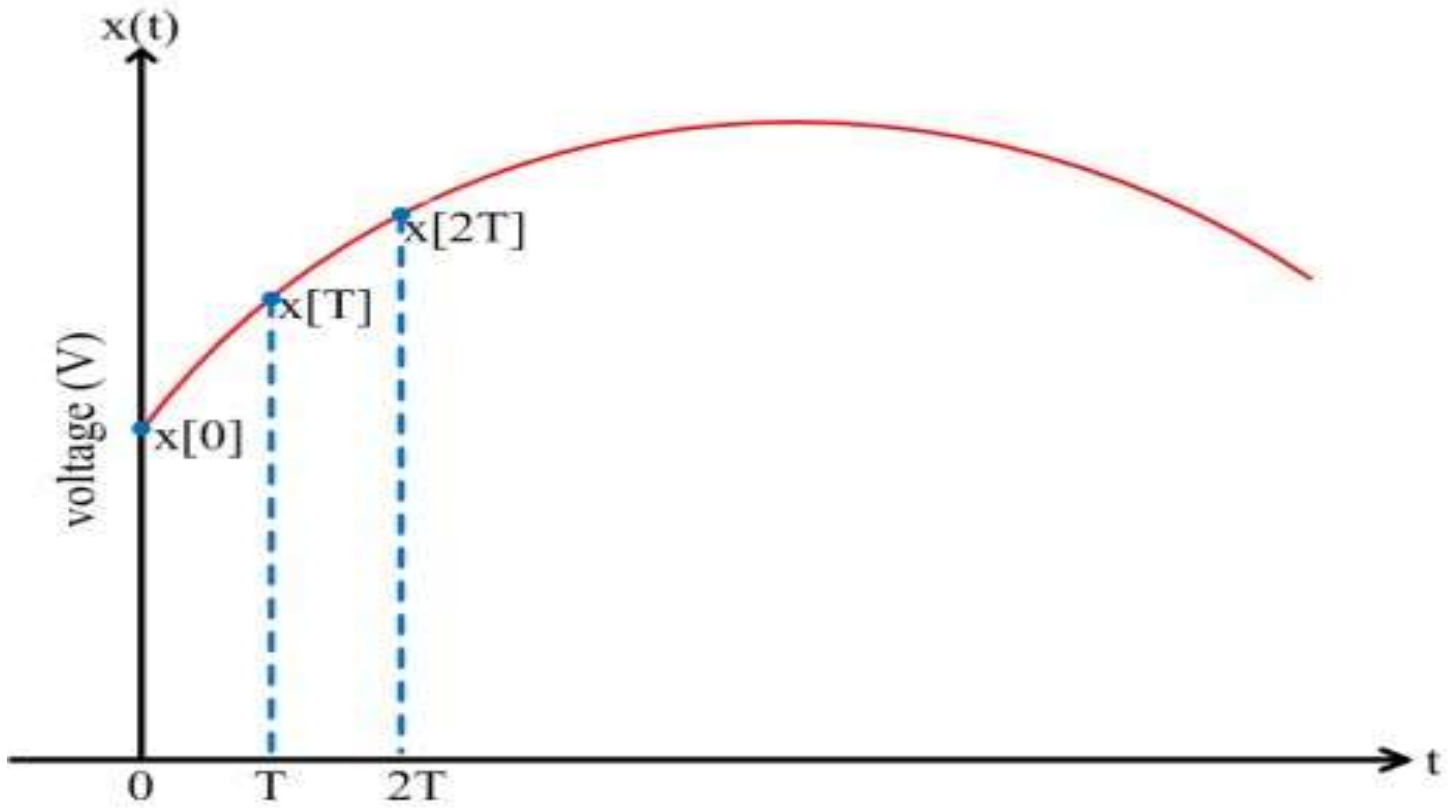


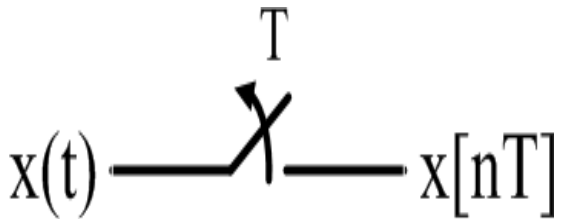


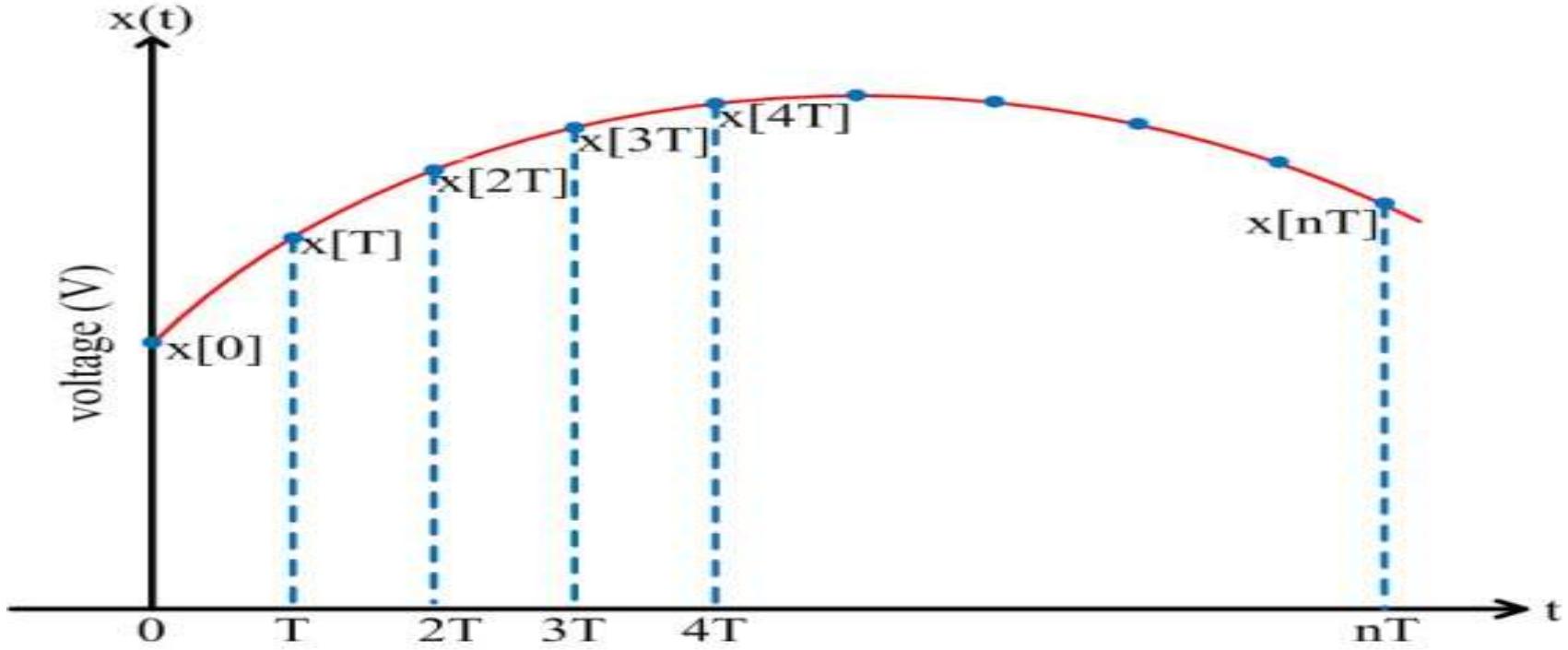
Sampling Process





Sampling Process

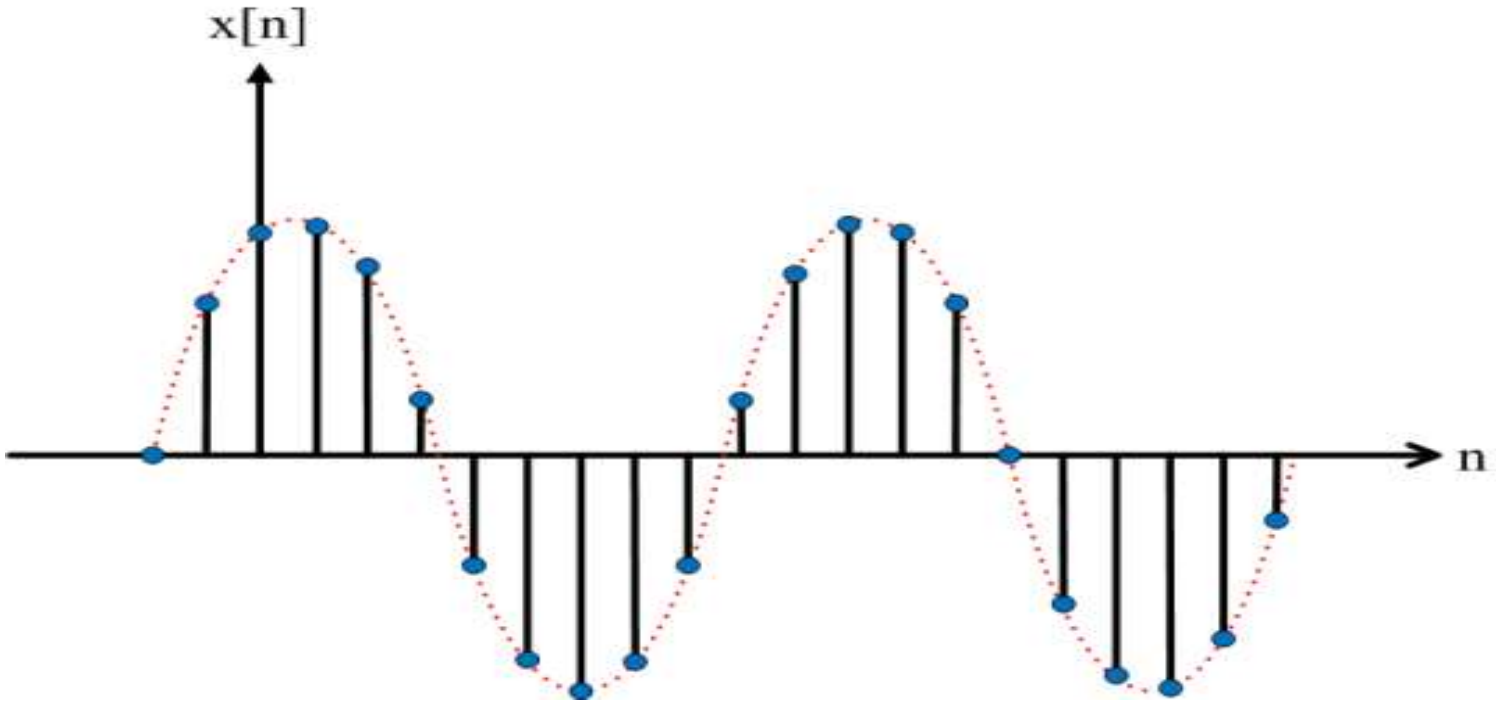




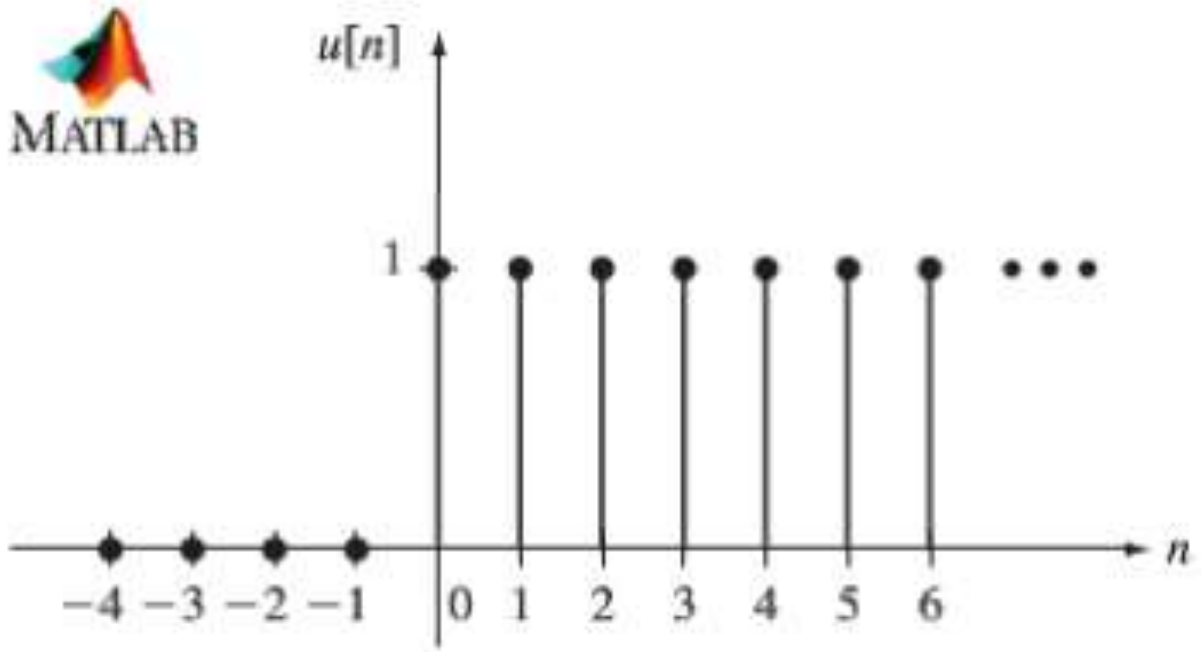
$$x[nT] = \{x[0], x[T], x[2T], \ldots x[nT]\}$$

Sinusoidal Sequence

$$x[n] = A\cos(n\omega_0 + \varphi)$$

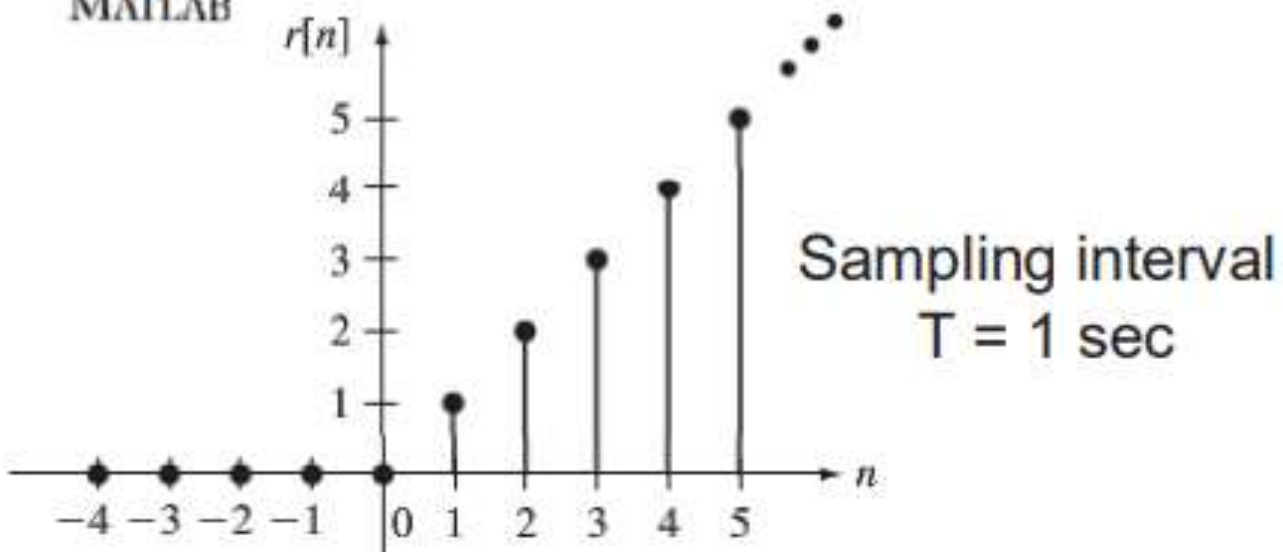


Unit - Step Function u(n)



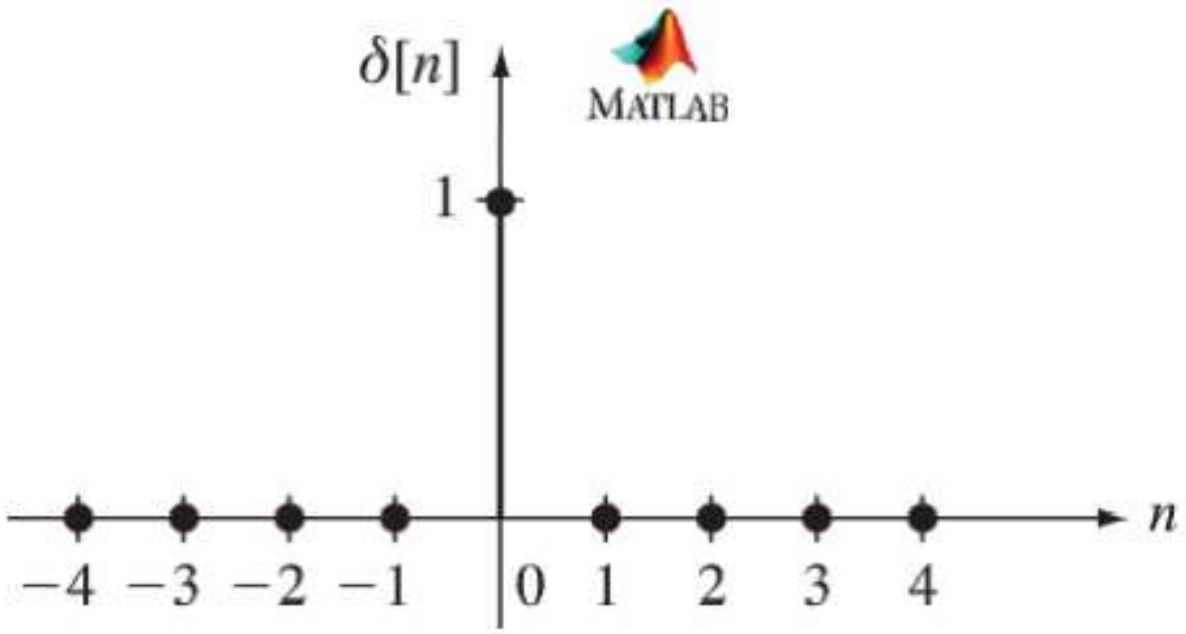
$$u[n] = \begin{cases} 1, & n = 0, 1, \ldots \\ 0, & n = -1, -2, \ldots \end{cases}$$

Unit - Ramp Function r(n)



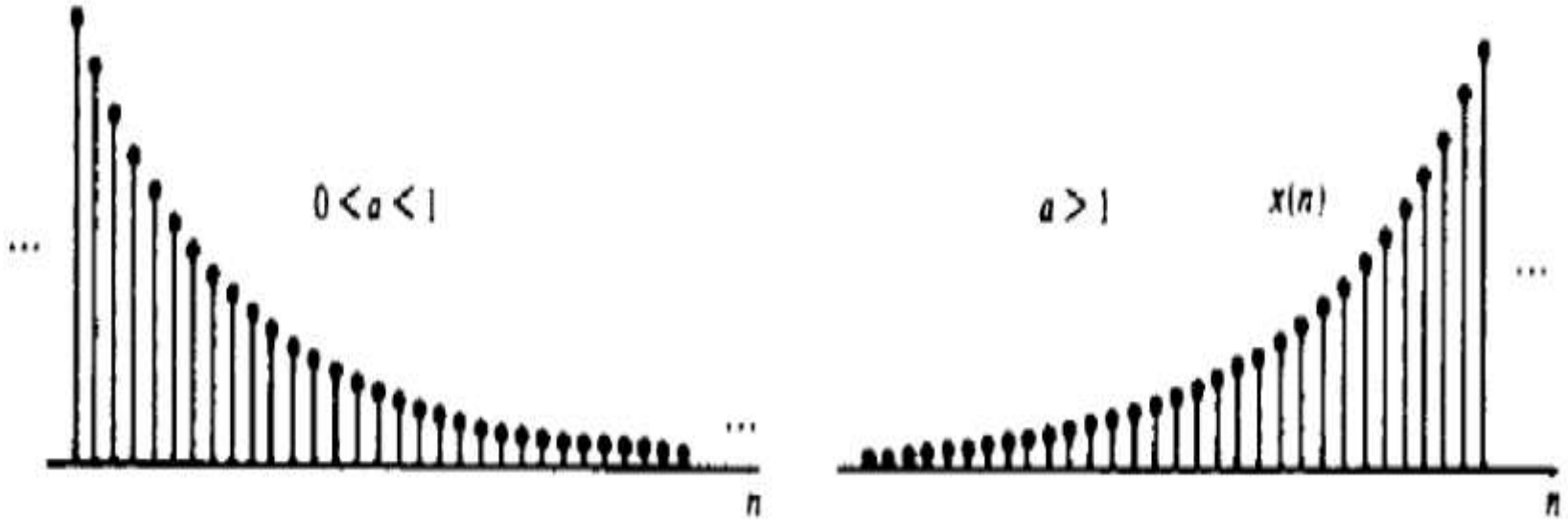
$$r[n] = \begin{cases} n, & n = 0, 1, \ldots \\ 0, & n = -1, -2, \ldots \end{cases}$$

Unit Impulse Function

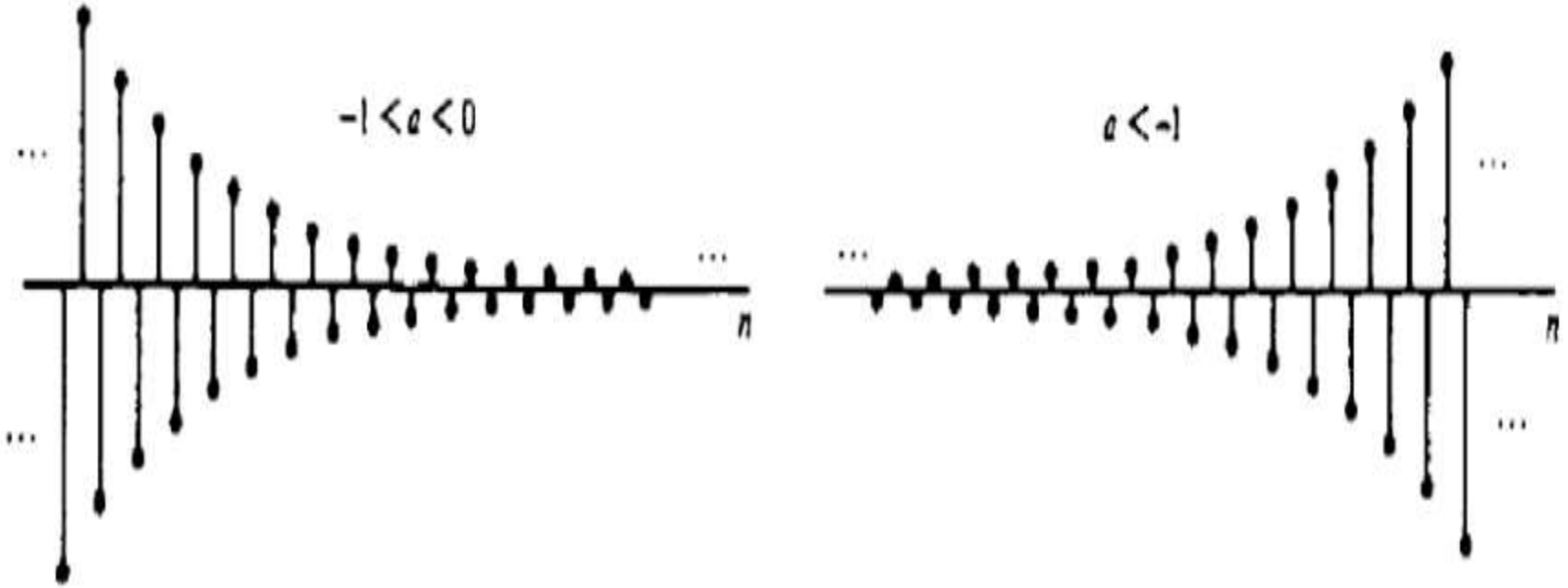


$$\delta[n] = \begin{cases} 1, & n = 0 \\ 0, & n \neq 0 \end{cases}$$

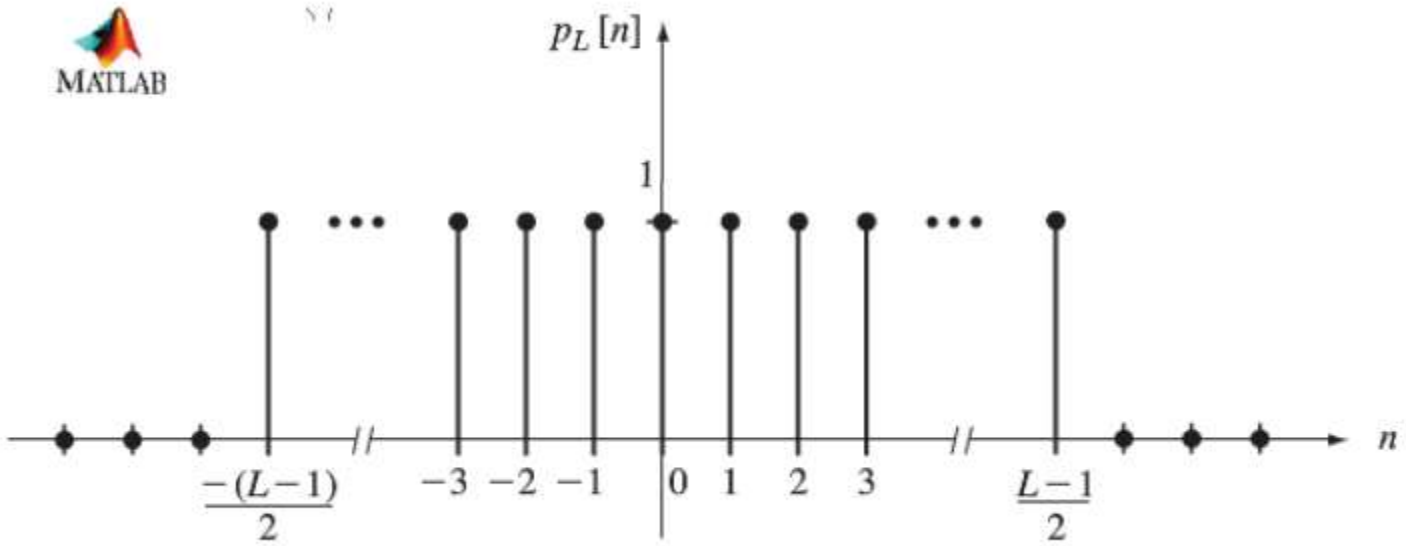
Real Exponential Sequence



Real Exponential Sequence



Rectangular Pulse Function



$$p_L[n] = \begin{cases} 1, & n = -(L-1)/2, \ldots, -1, 0, 1, \ldots, (L-1)/2 \\ 0, & \text{all other } n \end{cases}$$