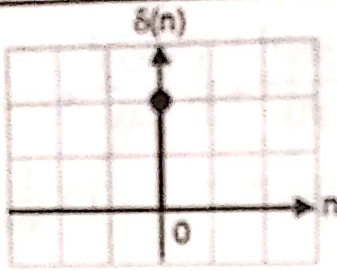
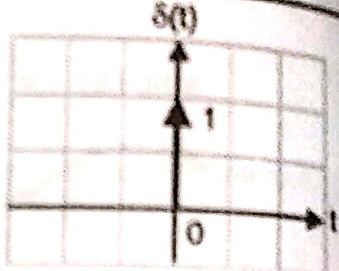
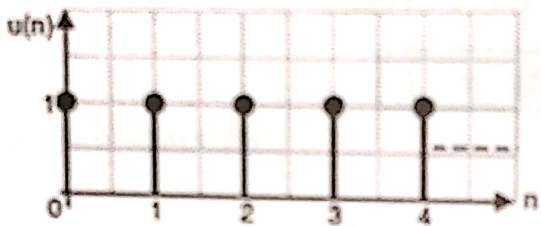
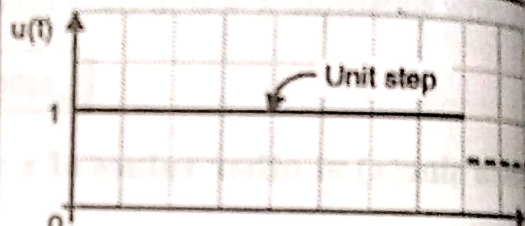
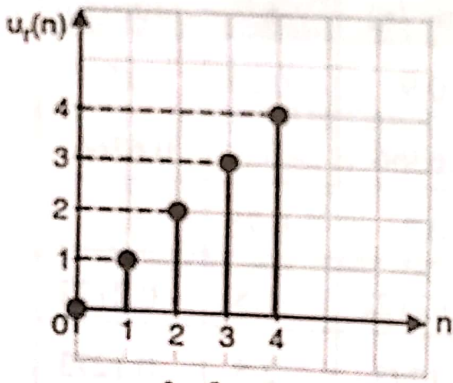
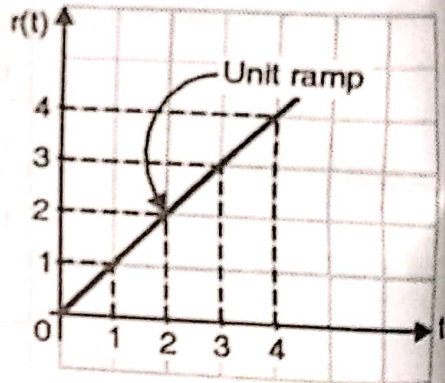
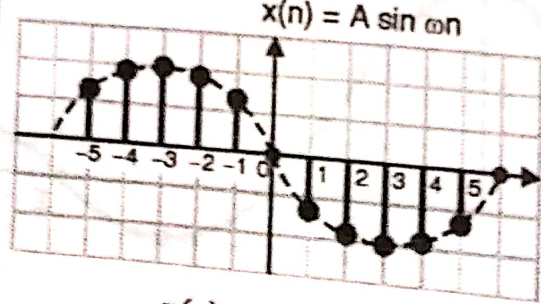
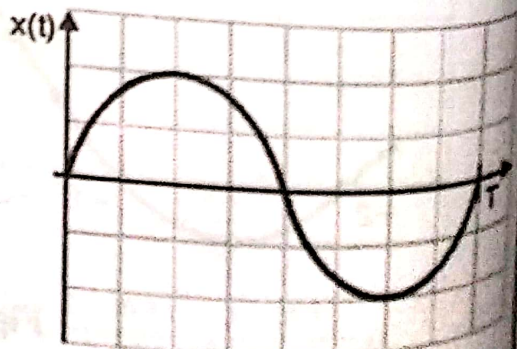
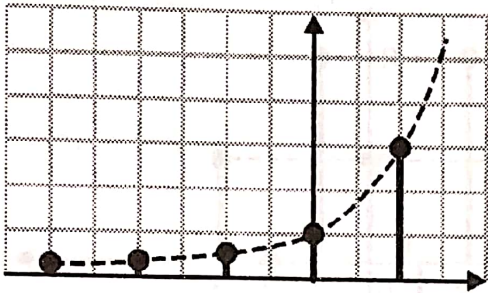
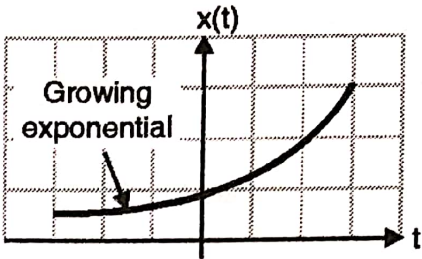
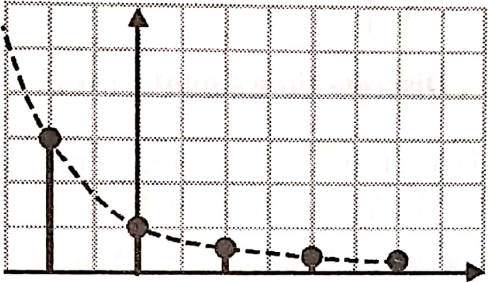
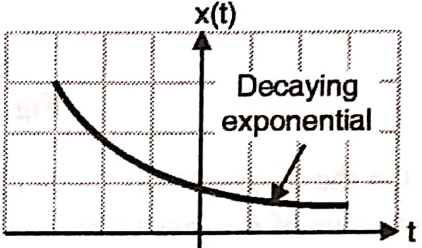
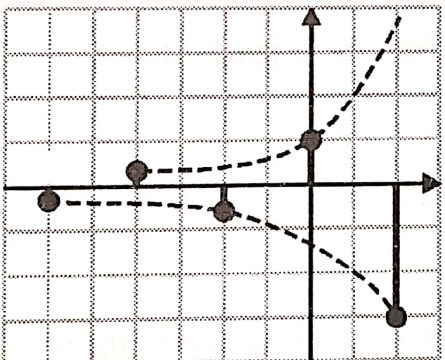
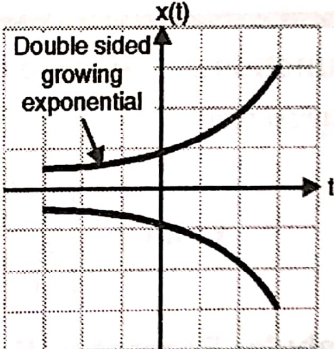
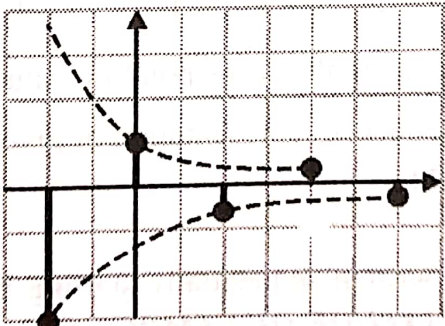
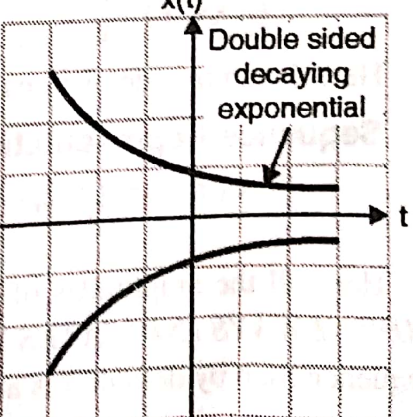


1.11.10 Summary of Elementary Signals :

Table 1.11.1 gives the summary of elementary signals.

Sr. No.	Type	D. T. Waveform	C. T. Waveform
1.	Delta or unit impulse	 <p>A discrete-time plot of the unit impulse signal $\delta(n)$. The horizontal axis is labeled n and the vertical axis is labeled $\delta(n)$. A single vertical stem with a dot at the top is located at $n=0$, reaching a height of 1. The origin is marked with 0.</p> $\delta(n) = \begin{cases} 1 & \text{for } n = 0 \\ 0 & \text{for } n \neq 0 \end{cases}$	 <p>A continuous-time plot of the unit impulse signal $\delta(t)$. The horizontal axis is labeled t and the vertical axis is labeled $\delta(t)$. A single vertical stem with an arrow at the top is located at $t=0$, reaching a height of 1. The origin is marked with 0.</p> $\delta(t) = \begin{cases} 1 & \text{for } t = 0 \\ 0 & \text{for } t \neq 0 \end{cases}$
2.	Unit step	 <p>A discrete-time plot of the unit step signal $u(n)$. The horizontal axis is labeled n and the vertical axis is labeled $u(n)$. Vertical stems with dots at the top are located at $n=0, 1, 2, 3, 4$, all reaching a height of 1. A dashed horizontal line extends from $n=4$ to the right. The origin is marked with 0.</p> $u(n) = \begin{cases} 1 & \text{for } n \geq 0 \\ 0 & \text{for } n < 0 \end{cases}$	 <p>A continuous-time plot of the unit step signal $u(t)$. The horizontal axis is labeled t and the vertical axis is labeled $u(t)$. A horizontal line is drawn at $u(t)=1$ for $t \geq 0$. A dashed horizontal line extends from $t=0$ to the left. An arrow points to the line with the label "Unit step". The origin is marked with 0.</p> $u(t) = \begin{cases} 1 & \text{for } t \geq 0 \\ 0 & \text{for } t < 0 \end{cases}$
3.	Unit ramp	 <p>A discrete-time plot of the unit ramp signal $u_r(n)$. The horizontal axis is labeled n and the vertical axis is labeled $u_r(n)$. Vertical stems with dots at the top are located at $n=0, 1, 2, 3, 4$, with heights 0, 1, 2, 3, and 4 respectively. Dashed horizontal lines extend from each stem to the vertical axis. The origin is marked with 0.</p> $u_r(n) = \begin{cases} n & \text{for } n \geq 0 \\ 0 & \text{for } n < 0 \end{cases}$	 <p>A continuous-time plot of the unit ramp signal $r(t)$. The horizontal axis is labeled t and the vertical axis is labeled $r(t)$. A straight line starts at the origin (0,0) and increases linearly with a slope of 1. Dashed lines connect points on the line to the axes. An arrow points to the line with the label "Unit ramp". The origin is marked with 0.</p> $r(t) = \begin{cases} t & \text{for } t \geq 0 \\ 0 & \text{for } t < 0 \end{cases}$
4.	Sinusoidal	 <p>A discrete-time plot of a sinusoidal signal $x(n)$. The horizontal axis is labeled n and the vertical axis is labeled $x(n)$. The signal is represented by a dashed sinusoidal curve with dots at each integer value of n from -5 to 5. The equation $x(n) = A \sin \omega n$ is written above the plot.</p> $x(n) = A \sin \omega n$	 <p>A continuous-time plot of a sinusoidal signal $x(t)$. The horizontal axis is labeled t and the vertical axis is labeled $x(t)$. A smooth sinusoidal wave is shown, starting at a positive value at $t=0$. The period of the wave is indicated by a horizontal line segment labeled T at the bottom.</p> $x(t) = A \sin \omega t$

Sr. No.	Type	D. T. Waveform	C. T. Waveform
5.	Exponential		
(i)	When $a > 1$	 <p style="text-align: center;">$x(n) = a^n$</p>	 <p style="text-align: center;">$x(t) = a^t$</p>
(ii)	When $0 < a < 1$	 <p style="text-align: center;">$x(n) = a^n$</p>	 <p style="text-align: center;">$x(t) = a^t$</p>
(iii)	When $a < -1$	 <p style="text-align: center;">$x(n) = a^n$</p>	 <p style="text-align: center;">$x(t) = a^t$</p>
(iv)	When $-1 < a < 0$	 <p style="text-align: center;">$x(n) = a^n$</p>	 <p style="text-align: center;">$x(t) = a^t$</p>