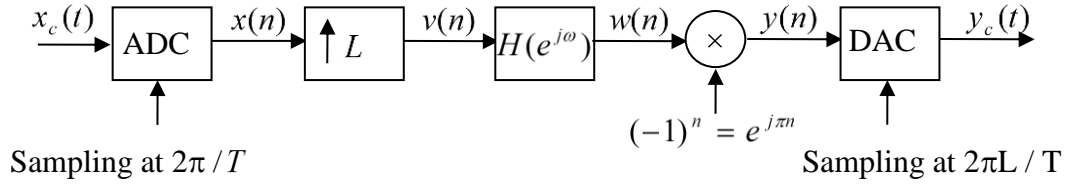3. Consider the system shown in Figure 1, where

$$H(e^{j\omega}) = \begin{cases} 1, & |\omega| < \pi/L, \\ 0, & \pi/L < |\omega| \le \pi. \end{cases}$$

$x_c(t)$ → ADC → $x(n)$ → ↑L → $v(n)$ → $H(e^{j\omega})$ → $w(n)$ → ⊗ → $y(n)$ → DAC → $y_c(t)$

Sampling at $2\pi/T$

$(-1)^n = e^{j\pi n}$

Sampling at $2\pi L/T$

Figure 1

Sketch $Y_c(j\Omega)$ if $X_c(j\Omega)$ is as shown in Figure 2.

Figure 2