EE 430 Fall 2014

Section 2

HW 4

Answers for 4, 6, 9

(4) $y[n] = x_c(t + nT - DT)\left[u(t + DT) - u(t - DT)\right]\Big|_{t=\frac{T}{5}}$

$$= \begin{cases} x_c(t + nT - DT) & -DT \le t \le DT \\ 0 & o.w \end{cases}\Bigg|_{t=\frac{T}{5}}$$

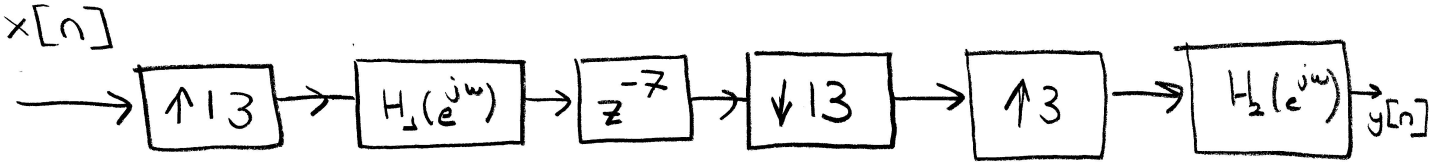
$$= x_c\left(\frac{T}{5} + nT - DT\right)$$

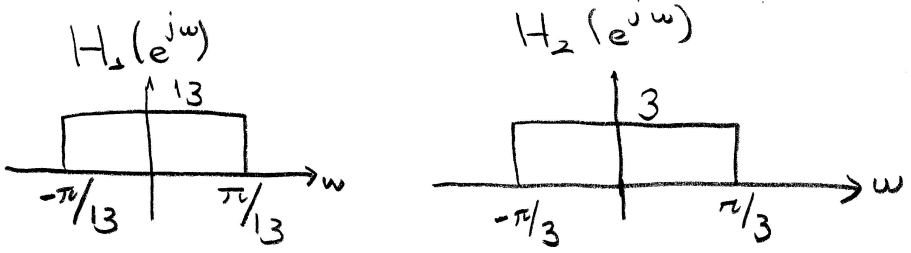
Conceptually, $y[n]$ can be obtained from $x[n]$ by reconstructing $x_c(t)$ from $x[n]$ and then by shifting $\left(DT - \frac{T}{5}\right)$ and resampling it with period T. However, this is not usually a practical approach because of the nonideal analog reconstruction filter, D/A converter, and A/D converter. Here, we obtain $y[n]$ using a FIR discrete time filter.

(6) a) It is more appropriate to take

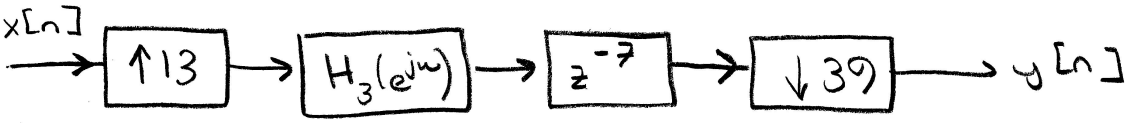
$$y[n] = x\left(t - \frac{7T}{13}\right)\Big|_{t=\frac{nT}{3}}$$ instead of

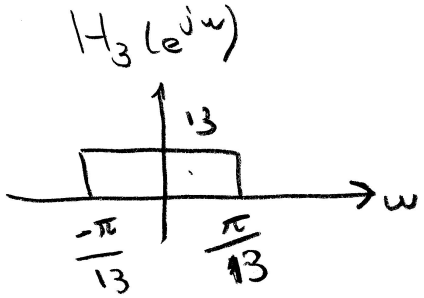
$$y[n] = x\left(t - \frac{7}{13}\right)\Big|_{t=\frac{nT}{3}}$$





b) $y[n] = x\left(t - \frac{7T}{13}\right)_{t=n3T}$





(9) If $G(e^{jw}) = H(e^{jwL}) \Rightarrow y_1[n] = y_2[n]$