

1. **(10 Pts Total)** Let $x_1[n] = \delta[n] + 2\delta[n-1] + 3\delta[n-2] + 2\delta[n-3] + \delta[n-4]$ and $x_2[n] = u[n] - u[n-3]$. Determine:
- (a) **(2 pt)** $y_1[n] = (x_1 * x_2)[n]$
 - (b) **(2 pt)** $y_2[n] = (x_2 * x_1)[n]$
 - (c) **(2 pt)** $y_3[n] = (x_2 * x_2)[n]$
 - (d) **(2 pt)** $y_4[n] = ((x_1 + x_2) * x_2)[n]$
 - (e) **(2 pt)** $y_5[n] = (x_2 * (x_2 + x_1))[n]$
2. **(9 Pts Total)** Determine whether each of the following systems is causal and/or BIBO stable. Justify your answer.
- (a) **(3 pts)** $h_1[n] = n(u[n+3] - u[n-3])$.
 - (b) **(3 pts)** $h_2[n] = nu[n-3]$.
 - (c) **(3 pts)** $h_3[n] = (0.999)^n u[n]$.
3. **(1 Pt Total)** (True or False) An LTI system with impulse response $h[n] = 145\delta[n]$ is memoryless.