For all homework throughout the semester you must do the following:

1. Explain in your own words what is being asked.
2. State your strategy for arriving at the solution.
3. Execute your strategy noting the steps.
4. ✎ Write legibly and in a logical order.

For each problem, we provide the approximate percentage of points.

Problem 1 [40 %]

We consider the causal Linear Time Invariant system described by the impulse response

$$h[n] = \begin{cases} 4 & \text{if } n = 0 \\ 3 & \text{if } n = 1 \\ 2 & \text{if } n = 2 \\ 1 & \text{if } n = 3 \\ 0 & \text{otehrwise} \end{cases}$$

Compute and sketch the response to the following inputs

1. $x_1 = \delta[n-1]$
2. $x_2 = 2\delta[n] - \delta[n-1]$
3. $x_3 = u[n] - u[n-5]$
4. $x_1 = u[n+5]$

Problem 2 [40 %]

We consider the causal Linear Time Invariant system described by the impulse response $h[n]$. We know that when

$$x[n] = \begin{cases} 1 & \text{if } n = 0 \\ 2 & \text{if } n = 1 \\ 3 & \text{if } n = 2 \\ 0 & \text{otehrwise} \end{cases}$$

then

$$y[n] = \begin{cases} 1 & \text{if } n = 1 \\ 2 & \text{if } n = 2 \\ 2 & \text{if } n = 3 \\ -2 & \text{if } n = 4 \\ -3 & \text{if } n = 5 \\ 0 & \text{otehrwise} \end{cases}$$

Find $h[n]$.

Problems from the textbook [6 x 33.3 % = 20%]

Solve the following problems from the textbook:

- 2.1
- 2.3
- 2.10
- 2.22
- 2.23
- 2.27