CENG 384 - Signals and Systems for Computer Engineers
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Homework 2

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Answer 3

$$y[n] = \frac{1}{5}x[n-1] + x[n]$$

a)

$$y[n] = \frac{1}{5}x[n-1] + x[n]$$

By feeding the system with unit impulse signal $x[n] = \delta[n]$

$$h[n] = \frac{1}{5}\delta[n-1] + \delta[n]$$

b)

Convoluting h[n] with $x[n] = \delta[n-2]$

$$\delta[n-2] * h[n] = \frac{1}{5}\delta[n-3] + \delta[n-2]$$

Resulting in a time shift of impulse response.

Output y[n] : $y[n] = \frac{1}{5}\delta[n-3] + \delta[n-2]$

c)

d)

$$h[n] \neq K\delta[n]$$

System has memory.

e)