

EE 3054 Fall 2011, Quiz 1

① Sketch the discrete-time signals

$$x(n] = u[n-2] + (n-4)u[n-4]$$

$$g[n] = u[n+3] + 2\delta[n] - 2\delta[n-3]$$

$$r[n] = \sum_{k=0}^{\infty} (0.9)^k \delta[n-10k]$$

② A discrete-time system is given by

$$y[n] = \begin{cases} x[n] & \text{if } x[n] \leq 2 \\ 2 & \text{if } x[n] > 2 \end{cases}$$

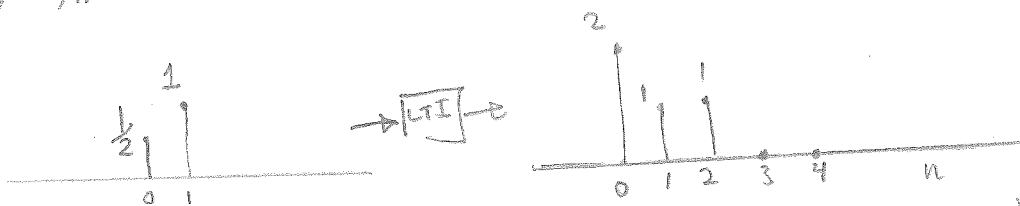
Sketch the output signal $y[n]$ produced by the input signal

$$x[n] = 0.25n u[n]$$

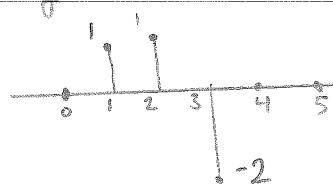
③ Classify the system in (2) as

- a) linear / non-linear
- b) time-invariant / time-varying
- c) stable / unstable
- d) causal / non-causal
- e) memoryless / with memory

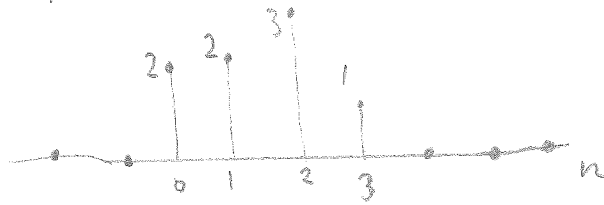
④ An LTI is observed with input signal shown producing output signal shown.



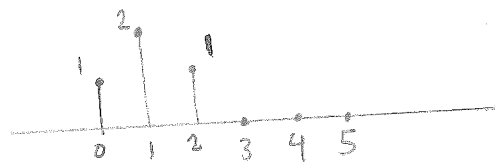
Find the output signal produced by the signal



⑤ The impulse response of an LTI system is given by



Find the system output produced by input signal



⑥ What is the impulse response of the 4-point moving average filter?

Also, give the system equation.