

**EE432 Fall 2008 Quiz 07**

1. A system has impulse response  $h[n] = (-1.1)^n u[n]$ .

a. Is the system causal?

yes  $h[n] = 0$  for  $n < 0$

b. Is the system IIR or FIR?

IIR

c. Is the system stable?

No  $\sum_{n=-\infty}^{\infty} |h[n]| = \sum_{n=0}^{\infty} (1.1)^n = \infty$

d. Is the system Recursive or non-recursive?

IIR - recursive

2. A system has impulse response  $h[n] = 0.5\delta[n-1] - 0.25\delta[n-10]$ .

a. Is the system causal?

yes  $h[n] = 0$  for  $n < 0$

b. Is the system IIR or FIR?

FIR

c. Is the system stable?

Yes  $\sum |h[n]| = 0.75 < \infty$

d. Is the system Recursive or non-recursive?

non-recursive

3. A system is described by:  $y[n] - y[n-1] - \frac{1}{4}x[n] = -\frac{1}{4}x[n-4]$ .

a. Is the system causal?

$$y[n] = y[n-1] + \frac{1}{4}x[n] - \frac{1}{4}x[n-4]$$

Yes

b. Is the system IIR or FIR? Are you sure?

FIR see answer to (d)

c. Is the system stable?

yes - FIR

d. Find the impulse response.

$$\text{let } x[n] = \delta[n]$$

n	$\frac{1}{4}x[n]$	$-\frac{1}{4}x[n-4]$	$y[n-1]$	$y[n] \leftarrow h[n]$
0	1/4	0	0	1/4
1	0	0	1/4	1/4
2	0	0	1/4	1/4
3	0	0	1/4	1/4
4	0	-1/4	1/4	0
5	0	0	0	0
	⋮	⋮	⋮	⋮

Bonus: Where were the Boer Wars fought?

South Africa