Name:_____

EE322 Fall 2008 Lab 05 Worksheet

1. A system is described by: $y[n] = 3x[n] + \left(x[n]\right)^2$.
    a. Prove whether this system is BIBO stable.
    b. Prove whether this system is linear.
    c. Prove whether this system is time-invariant.
    d. Is this system static? Why or why not?
    e. Is this system causal? Why or why not?

2. A system is described by: $y(t) = e^{-x(t)}$.

   a. Prove whether this system is BIBO stable.
   b. Prove whether this system is linear.
   c. Prove whether this system is time-invariant.
   d. Is this system static? Why or why not?
   e. Is this system causal? Why or why not?
   f. Is this system invertible? Why or why not?

3. A system is described by: $y[n] = \frac{x[n+2]}{n}$.

   a. Prove whether this system is BIBO stable.
   b. Prove whether this system is linear.
   c. Prove whether this system is time-invariant.
   d. Is this system static? Why or why not?
   e. Is this system causal? Why or why not?
   f. Is this system invertible? Why or why not?

4. Draw a block diagram using integrators and adders of the system described by:
$4y'''(t) - 0.5y''(t) - x(t) - 5y(t) = -y'(t)$.

5. Draw a block diagram of the discrete-time system described by:
$x[n]-2x[n-1]+0.2x[n-1]-y[n-2]=y[n-1]-3y[n]$.

6. Given $h(t)$ shown to the right, plot $\frac{1}{5}z\left(2+\frac{t}{2}\right)$.