

University of Victoria
Department of Electrical and Computer Engineering
ELEC 310-Spring 2010
Assignment 5 worth 3% of final course mark

Issued: April 1, 2010

Due: April 8, 2010, 4:00 pm

Please use the ELEC 310 drop box by the ELW 2nd floor elevator

Problem 1.

Consider the following two system functions corresponding to causal LTI systems:

$$H_1(z) = \frac{1}{\left(1 - z^{-1} + \frac{1}{4}z^{-2}\right)\left(1 - \frac{2}{3}z^{-1} + \frac{1}{9}z^{-2}\right)}$$

$$H_2(z) = \frac{1}{\left(1 - z^{-1} + \frac{1}{2}z^{-2}\right)\left(1 - \frac{1}{2}z^{-1} + z^{-2}\right)}$$

- a) For each system function, draw a direct form II block diagram
- b) For each system function, draw a block diagram that corresponds to the cascade connection of two second-order block diagrams. Each second-order block diagram should be in direct form II.
- c) For each system function, determine whether there exists a block diagram representation that is the cascade of four first-order block diagrams with the constraint that all coefficient multipliers must be real.

Problem 2.

6.22 Oppenheim & Schaffer

Problem 3.

6.25 Oppenheim & Schaffer