EE3210 Signals and Systems

Tutorial 7

Problem 1: Consider a discrete-time LTI system whose input $x[n]$ and output $y[n]$ are related by the difference equation

$$2y[n] - y[n-1] + y[n-3] = x[n] - 5x[n-4].$$

(a) Draw the block diagram representation of the system in direct form I.

(b) Draw the block diagram representation of the system in direct form II.

Problem 2: Consider a continuous-time LTI system whose input $x(t)$ and output $y(t)$ are related by the differential equation

$$a_1 \frac{dy(t)}{dt} + a_0 y(t) = b_0 x(t) + b_1 \frac{dx(t)}{dt}.$$

(a) Draw the block diagram representation of the system in direct form I.

(b) Draw the block diagram representation of the system in direct form II.