EE 233 Homework 2.

2-3. Find the z-transforms of the number sequences generated by sampling the following time functions every T seconds, beginning at $t = 0$. Expressed the transforms in closed-form.

a. $e(t) = e^{-at}$
b. $e(t) = e^{-(t - T)}u(t - T)$
c. $e(t) = e^{-(t - 5T)}u(t - 5T)$

2-4. Find the z-transform, in closed-form, of the number sequence generated by sampling the time function $e(t)$ every T seconds beginning at $t = 0$. The Laplace transform of $e(t)$ is

$$E(s) = \frac{2\,(1 - e^{-5s})}{s(s + 2)}, \quad T = 1\ s$$

2-8. FInd the inverse z-transform of each $E(z)$ below by using the four methods described in the lecture (power series, partial fraction expansion, inversion, and discrete convolution). Compare the values of $e(k)$ for $k = 0,\ 1,\ 2,\ 3$, obtained by the four methods.

a.

$$E(z) = \frac{0.5z}{(z - 1)(z - 0.6)}$$

b.

$$E(z) = \frac{0.5}{(z - 1)(z - 0.6)}$$

c.

$$E(z) = \frac{0.5(z + 1)}{(z - 1)(z - 0.6)}$$

d.

$$E(z) = \frac{z(z - 0.7)}{(z - 1)(z - 0.6)}$$