INEC013: ADC.

Assignment

Q1. Find the fourier Transform of the following signals.

(a) $g(t) = A \text{ rect}\left(\frac{t}{T}\right) \cos \omega_c t$

(b) $g(t) = e^{-at} \cos \omega_c t \; u(t)$

(c) $g(t) = A \text{ Sinc}\left(\frac{t}{2\pi}\right)$

(d) $x(t) = 25 \text{ rect}\left(\frac{t-4}{10}\right)$

Q2. Let $X(\omega) = \text{rect}\left(\omega - \frac{1}{2}\right)$.
Using the fourier Transform properties, find the Fourier Transform of the following signals.

(a) $x(-t)$

(b) $t \cdot x(t)$

(c) $x(-2t+4)$

(d) $x(2t-1)\, e^{-j2t}$

Q3. Find the Hilbert transform of the following signals.

(a) $y(t) = x(t) \cos 2\pi f_c t$

(b) $x(t) = \text{rect}(t)$

(c) $x(t) = \frac{1}{t}$

(d) $x(t) = \text{Sinc}(2t)$.

Q4: Determine the pre-envelope, complex envelope of the radiofrequency (RF) pulse defined by

$g(t) = A \text{ rect}\left(\frac{t}{T}\right) \cos \omega_c t$.