

EECS20n, Quiz 8, 12/02/04

The quiz will take 10 minutes. Write your response on the sheet. Print your name and lab time here:

Last Name _____ First _____ Lab time _____

1. An audio signal x has Fourier Transform X such that $X(\omega) = 0, |\omega| > 2\pi \times 10,000$ rad/sec. The transmitted signal is $y(t) = \cos(2\pi \times f_c t) \times x(t)$, in which the carrier frequency is $f_c = 100,000$ Hz.

1. **5 points** For what values of ω is $Y(\omega) = 0$?
2. **5 points** An AM receiver constructs the signal $z(t) = y(t) \times \cos(2\pi f_c t)$. Express z in terms of x .

2. **10 points** Consider the feedback system below. First find the frequency response H and then the impulse response h . [Hint Recall $e^{-t}u(t) \leftrightarrow \frac{1}{1+i\omega}$ and the time change formula $x(at) \leftrightarrow \frac{1}{|a|}X(\frac{\omega}{a})$.

