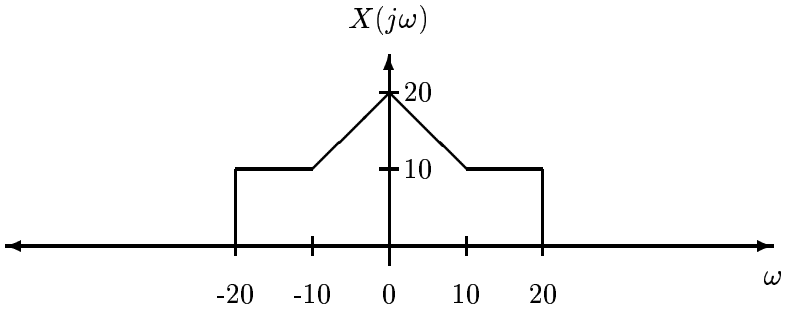
ESE 305 – Quiz # 6 Name _____

1. **(15 pts Total)** A signal $x(t)$ has Fourier Transform given below.



   (a) **(3 pts)** Determine the Nyquist sampling rate of this signal. Provide the proper unit.

   (b) **(3 pts)** Determine the Nyquist sampling rate of the signal $y(t) = [x(t)]^2$. Provide the proper unit.

   (c) **(3 pts)** Determine the Nyquist sampling rate of the signal $z(t) = x(t) * x(t)$. Provide the proper unit.

   (d) **(6 pts)** Let $x[n] = x(t)|_{t=nT_s}$, where $T_s = \pi/25$. Plot $X(e^{j\omega})$, the Fourier transform of $x[n]$.

2. **(5 pts Total)** A signal $x[n]$ is obtained by uniform sampling of a continous-time signal $x(t)$ at its Nyquist rate $\omega_s = 200$ rad/sec. The Fourier transform of $x[n]$ is $X(e^{j\omega}) = 4 + 4\cos(\omega)$. Determine and plot the Fourier transform of $x(t)$.