

EE411 Homework 8

- (1) Estimate the bandwidth of FM signal and the bandwidth of PM signal if the modulating signal is $m(t) = 4 \sin 2000\pi t$. Assume $k_f = \pi \times 10^3$ and $k_p = 2$.

- (2) An angle-modulated signal with carrier frequency $\omega_c = 2\pi \times 10^5$ (rad/sec) is described by the equation

$$\phi_{EM}(t) = 10 \cos(\omega_c t + 2 \sin 700\pi t + 4 \sin 900\pi t)$$

- Find the average power of $\phi_{EM}(t)$
- Find the frequency deviation Δf
- Find the deviation ratio β
- Estimate the bandwidth of $\phi_{EM}(t)$

- (3) Fig. 1 shows Fourier spectra of signals $g_1(t)$ and $g_2(t)$. Determine the Nyquist rate f_s of signals $g_1(t)$, $g_2(t)$, and $g_1(t)g_2(t)$.

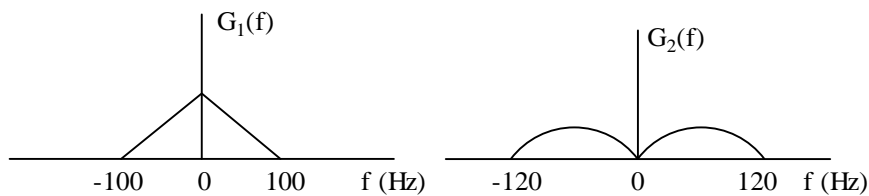


Fig. 1