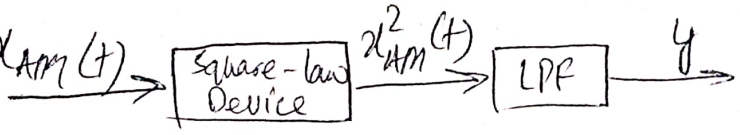
Assignment # 2

CLO-2, Level: C4

PLO-2 (Problem Analysis).

① Analyze the Square law detector shown in the figure below. Draw and write the necessary figures and expressions for $x_{AM}(t)$, $x^2_{AM}(t)$, y. Assume at the input of the detector is DSB+C applied.



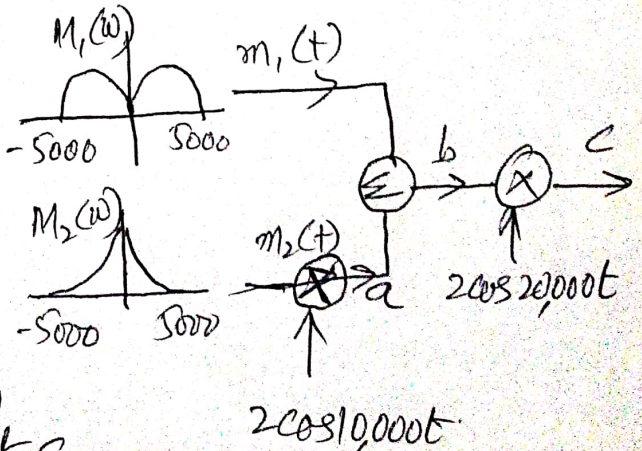
② CLO-3, Level: C5, PLO3

Two signals $m_1(t)$ and $m_2(t)$, both band-limited to 5000 rad/s, are to be transmitted simultaneously over a channel by the multiplexing scheme shown in figure below. The signal at point b is the multiplexed signal, which now modulates a carrier of frequency 20,000 rad/s. The modulated signal at Point c is transmitted over a channel.

a) sketch signal Spectra at Points a, b and c

b) What must be the BW of the channel?

c) Design a receiver to recover signal $m_1(t)$ and $m_2(t)$ from the modulated signal at Point c.



Assignment #3 :-

(1) Analyze the wideband Frequency Modulated and describe the fallacy exposed while estimating the Bandwidth.

(2) An angle-Modulated signal with carrier frequency $\omega_c = 2\pi \times 10^6$ is described by the equation

$$\phi_{EM}(t) = 10 \cos(\omega_c t + 0.1 \sin 2000\pi t)$$

a) find Power of the Modulated Signal.

b) Find the frequency deviation Δf.

c) Find the Phase deviation $\Delta \phi$.

d) Estimate the BW of $\phi_{EM}(t)$.