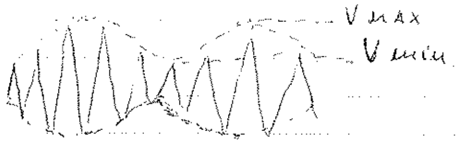


$v(t)_{max} = V_p [1+m] \cos(2\pi f_p t)$

$v(t)_{min} = V_p [1-m] \cos(2\pi f_p t)$

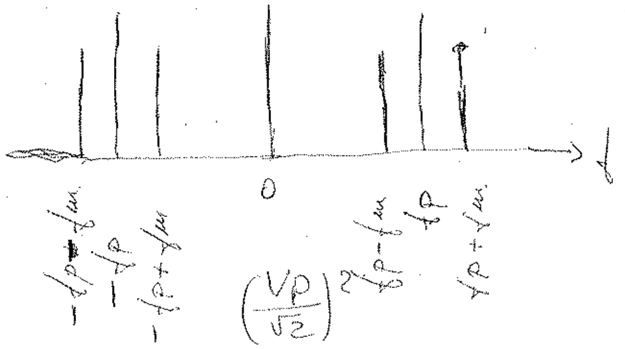
b) $v(t) = V_p [1 + m \cdot \cos(2\pi f_m t)] \cos(2\pi f_p t)$

$v(t) = V_p (\cos(2\pi f_p t + m \cos(2\pi f_m t) \cos(2\pi f_p t)$

$B = 2\pi f_m t$

$A = 2\pi f_p t$

$v(t) = V_p \left[\cos(2\pi f_p t) + m \cdot \frac{1}{2} \left(\cos(A+B) + \cos(A-B)\right)\right]$



$\left(\frac{V_p}{\sqrt{2}}\right)^2$

Pot en dBm $= 10 \log \left(\frac{V_p^2 / \sqrt{2}}{2 Z_0} \cdot 10^3 \right)$ de f_p

$P_p = \frac{1}{2R} \left(\frac{V_p}{\sqrt{2}}\right)^2$

Pot en dBm $= 10 \log \left[\left(\frac{m^2 (0'5 / \sqrt{2})^2}{2 Z_0} \frac{V_p^2}{2 Z_0} \right) \cdot 10^3 \right]$

$P_{SB} = \frac{m^2 \left(\frac{X}{\sqrt{2}}\right)^2 P_p}{2R}$

3) Amplitud portadora $= \frac{V_{max} - V_{min}}{2} = \frac{27,5 - 12,5}{2} = \frac{15}{2} = 7'5 V$

indice de modulacion$(m) = \frac{V_{max} - V_{min}}{V_{max} + V_{min}} = \frac{27,5 - 12,5}{27,5 + 12,5} = \frac{15}{40} = 0,125$

4)

frecuencia portadora $= 25$ MHz

frecuencia moduladora $= 5$ MHz

$P_p = 6,99$ dBm $= 5$ mW

$P_{SB} = 0,869$ dBm $= 1,24$ mW

Amplitud portadora $\frac{V_p}{\sqrt{2}} = \sqrt{2 P_p Z_0} = \sqrt{2 \cdot 5mW \cdot 50} = 0,707 \Rightarrow 0,707 \cdot \sqrt{2} = 1V$

Amplitud moduladora
indice de modul.

$1 = (m^2) \left(\frac{X}{\sqrt{2}}\right)^2 = \frac{P_{SB}\, 2R}{P_p} = \frac{1'24 mW \cdot 2 \cdot 50\Omega}{5 mW}$

$m = -[(P_p - P_{SB})(dB) - 6dB] = -[(7-1) - 6] = 0 dB \Rightarrow m = 1$