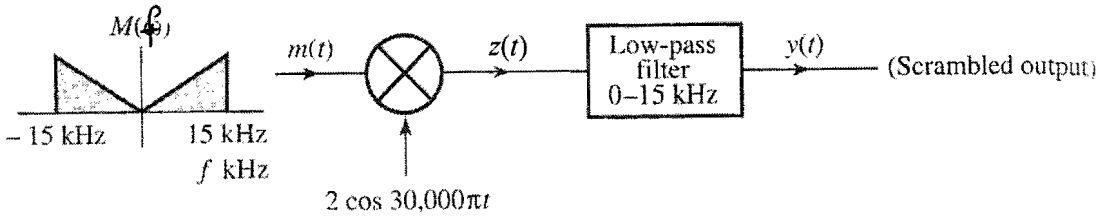
King Fahd University of Petroleum & Minerals
Electrical Engineering Department
EE370: Communications Engineering I (101)
Quiz 3: AM and DSB-SC
Dr. Ali Muqaibel

Serial # 0

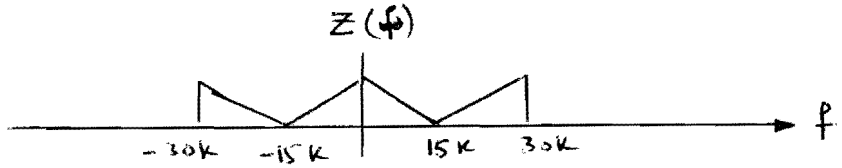
-1 points for not writing your serial #

Name: KEY Sec. 2

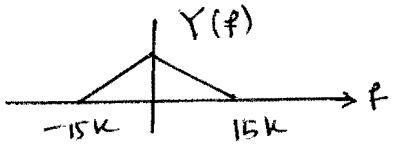
1. The system shown in the figure is used for scrambling audio signals. The output $y(t)$ is the scrambled version of the input $m(t)$. *In any sketch show all important values.*



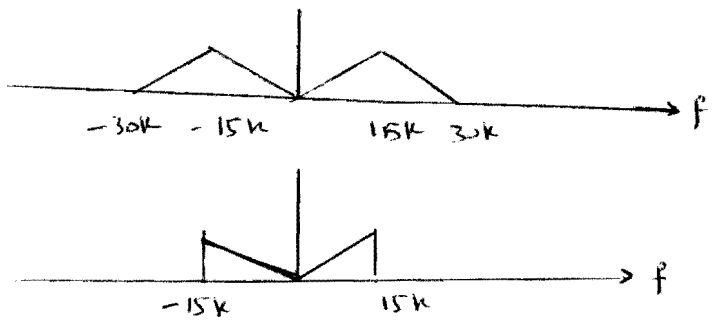
a) Sketch the spectrum of $z(t)$, at the output of the multiplier . **(2 points)**



b) Sketch the spectrum of the scrambled signal $y(t)$. **(1 point)**



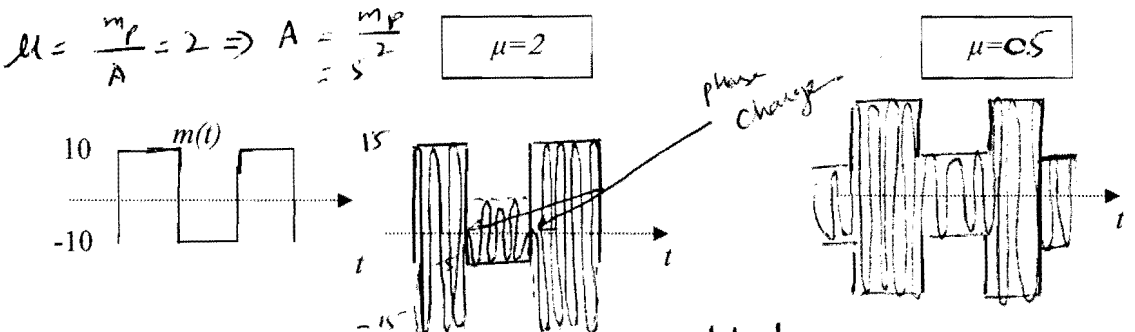
c) Show that the same system can be used to descramble $y(t)$ to obtain $m(t)$. To show that, feed the output signal back and sketch the spectrum before and after the low-pass filter. **(2 points)**



2. Sketch the AM signal $[A+m(t)]\cos\omega_c t$ for the periodic signal $m(t)$ shown in the figure below corresponding to the modulation index (a) $\mu = 2$ (b) $\mu = 0.5$ **(4 points)**

$\mu = \frac{m_p}{A} = 2 \Rightarrow A = \frac{m_p}{2} = 5$

$A = \frac{m_p}{\mu} = 20$



What do we call the AM system if $\mu>1$:..... over modulated ..... **(1 point)**

Good Luck, **Dr. Ali Muqaibel**