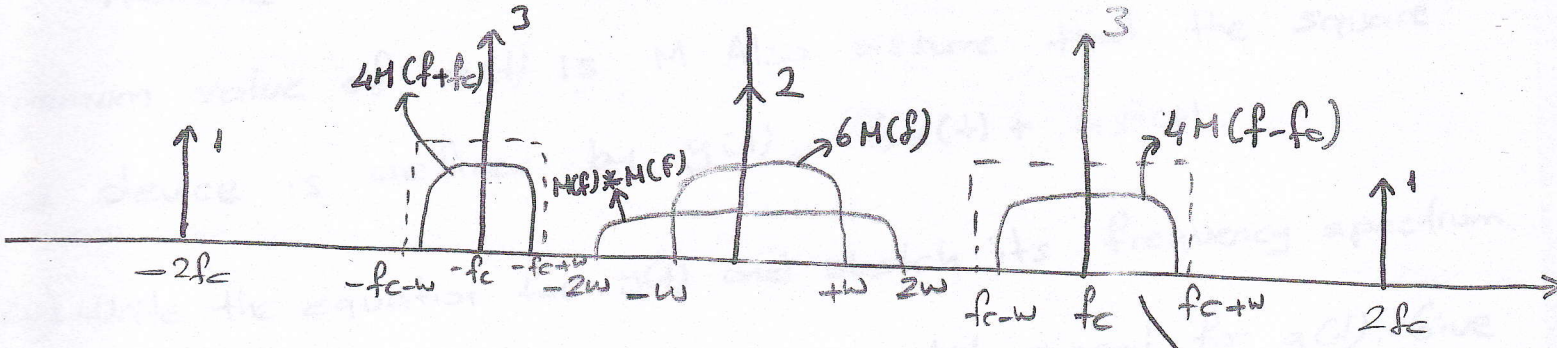
$$6m(t) + 6\cos\omega_c t + 4m^2(t) + \underbrace{4\cos^2\omega_c t}_{(2+2\cos 2\omega_c t)} + 8m(t)\cos\omega_c t$$

$$= 2 + 6m(t) + 4m^2(t) + 6\cos\omega_c t + 8m(t)\cos\omega_c t + 2\cos 2\omega_c t$$

$$Y(f) = 2\delta(f) + 6M(f) + 4M(f) * M(f) + 3\delta(f-f_c) + 3\delta(f+f_c) +$$

$$+ 4M(f-f_c) + 4M(f+f_c) + \delta(f-2f_c) + \delta(f+2f_c)$$




b) Filtrenin karakteristiği:

$f_c$ frekansında BPF. [$f_c$ anındaki $m(t)$'in genişliğinden]

$BW > 2W$ → mesajdan: $-w$'dan $w$'ya olduğundan ← gönderilmek istenen yer

$f_c > 3W \rightarrow 2w < f_c - w \Rightarrow 3w < f_c.$

:-)

$$Y(t) = \underbrace{6m(t)}_{\omega_c \text{ yok}} + \underbrace{6\cos\omega_c t}_{\omega_c \text{ yok}} + \underbrace{4m^2(t)}_{\omega_c \text{ yok}} + \underbrace{4\cos^2\omega_c t}_{(2+2\cos 2\omega_c t)} + \underbrace{8m(t)\cos\omega_c t}_{2\omega_c > \omega_c \rightarrow \text{geçmez}}$$

$$g(t) = 6\cos\omega_c t + 8m(t)\cos\omega_c t \Rightarrow 6\left[1 + \underbrace{\frac{8}{6}}_{k_a} m(t)\right]\cos\omega_c t$$

$k_a m(t) = M$ = index

$$\max x(t) = \max[m(t) + \cos\omega_c t] = 1 + \max m(t) = M$$