Question 1

Find the output SNR of the demodulator in the Fig. 1, where

1. $m(t)$ **is a lowpass message with the bandwidth** W**.**
2. **The frequency response of the bandpass filters is** $\sqcap(\frac{f-f_c}{2W}) + \sqcap(\frac{f+f_c}{2W})$**.**
3. **The input-output relation in the distortion-less channel is** $y(t) = Lx(t-D)$**.**
4. $n_W(t)$ **is an AWGN noise with the power spectral density** $\frac{N_0}{2}$**.**
5. **The oscillators generate** $A_c \cos(2\pi f_c t)$**.**
6. **The lowpass filter is described by** $\sqcap(\frac{f}{2W})$**.**

. For which values of the attenuation $L \leq 1$ **and delay** $D \geq 0$ **the SNR is maximized?**

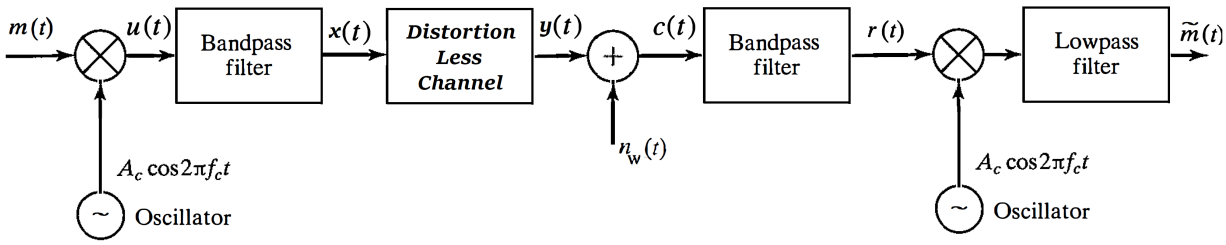

Figure 1: DSB system with a noisy distortion-less channel.