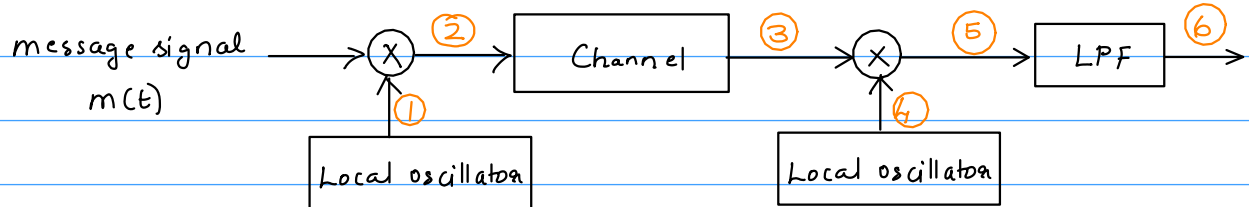


Out: 23/08/2018

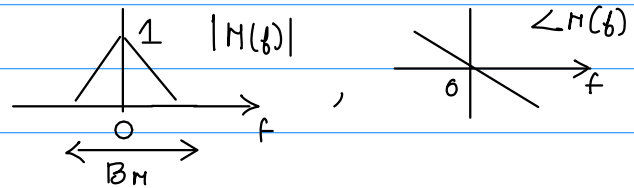
Not required to be submitted -  
Self study (but do before midterm-I)

# AV314 - Assignment 5

1) The signal flow diagram of a DSB system is shown below

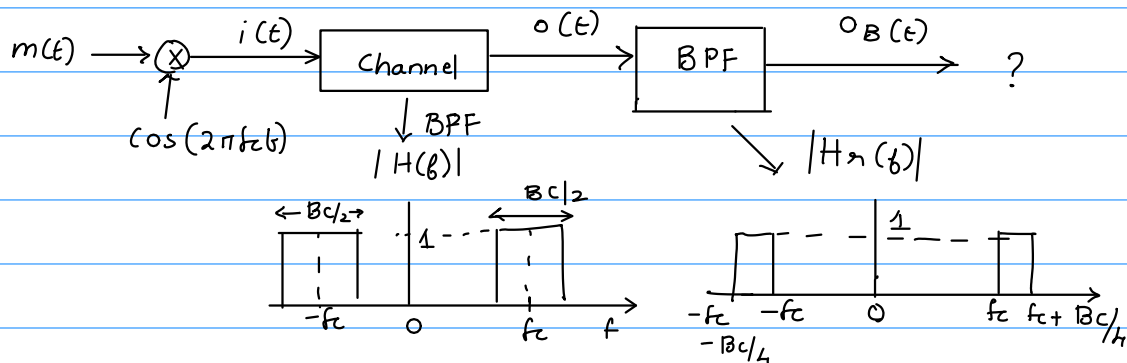


Suppose  $m(t)$  has the spectrum



Draw the spectrum of the signals at ①, ②, ③, ④, ⑤ and ⑥ if the channel is an ideal BPF centered at  $f_c$  with a bandwidth  $B_c \geq 2B_M$  and it is required that the signal at ⑥ is a replica of the signal  $m(t)$ .

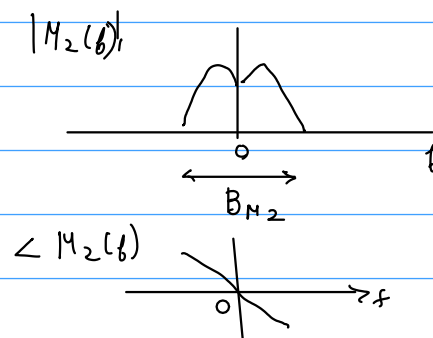
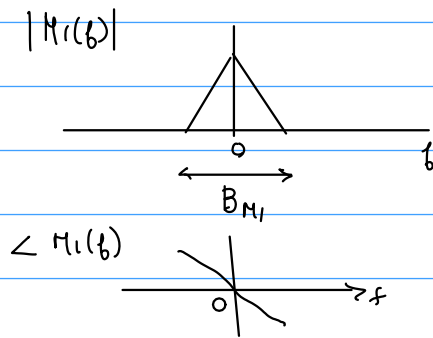
2) Consider a DSB system as shown:  $m(t)$  is the same signal as in Q1;  $B_c \geq 2B_M$



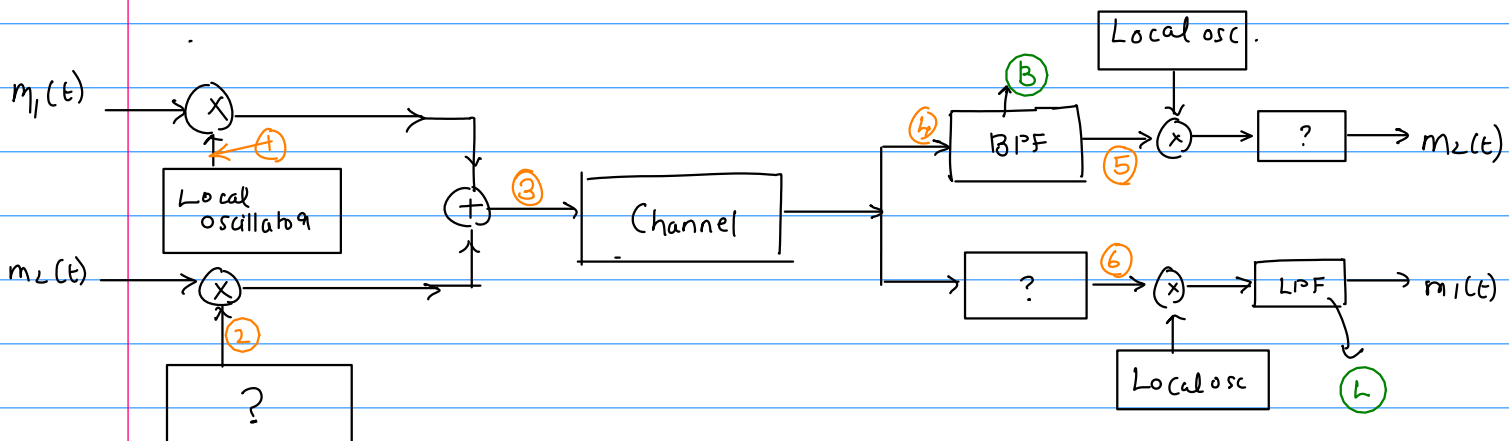
The channel and the bandpass filter have the freq responses shown by  $|H(f)|$  and  $|H_2(f)|$  (and linear phase response). Draw the spectrum of  $o_B(t)$ . How will you recover  $m(t)$  from  $o_B(t)$ ? Draw a signal flow diagram / block diagram which shows how this recovery is done.

(PTO).

3) Suppose I have two baseband signals  $m_1(t)$  and  $m_2(t)$  with spectra as shown:



Write down the functions (input  $\rightarrow$  output map) of the blocks marked by ? in the following signal flow diagram. Write down what the signals are at ①, ②, ③, ④, ⑤, ⑥. What should be the freq responses of ⑥ and ⑦?



Assume that the channel has the following freq response:

