

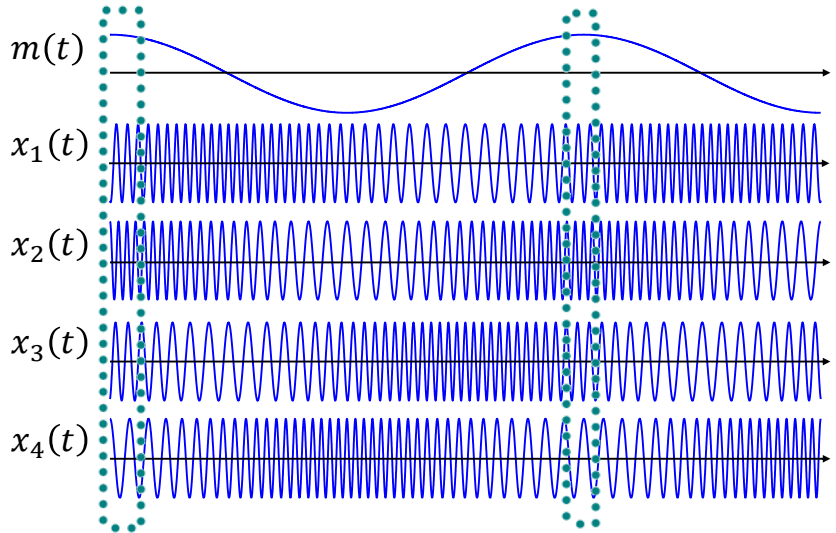
ECS 332: In-Class Exercise # 15

Instructions

1. Separate into groups of no more than three persons. **The group cannot be the same as any of your former groups after the midterm.**
2. Write down all the steps that you have done to obtain your answers. You may not get full credit even when your answer is correct without showing how you get your answer.
3. **Do not panic.**

Date: 02 / 11 / 2018			
Name			ID (last 3 digits)
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1. Consider five plots below. The top one is the baseband message signal $m(t)$ which is used in the modulation to create the FM signal. Identify which plot is $x_{FM}(t)$.



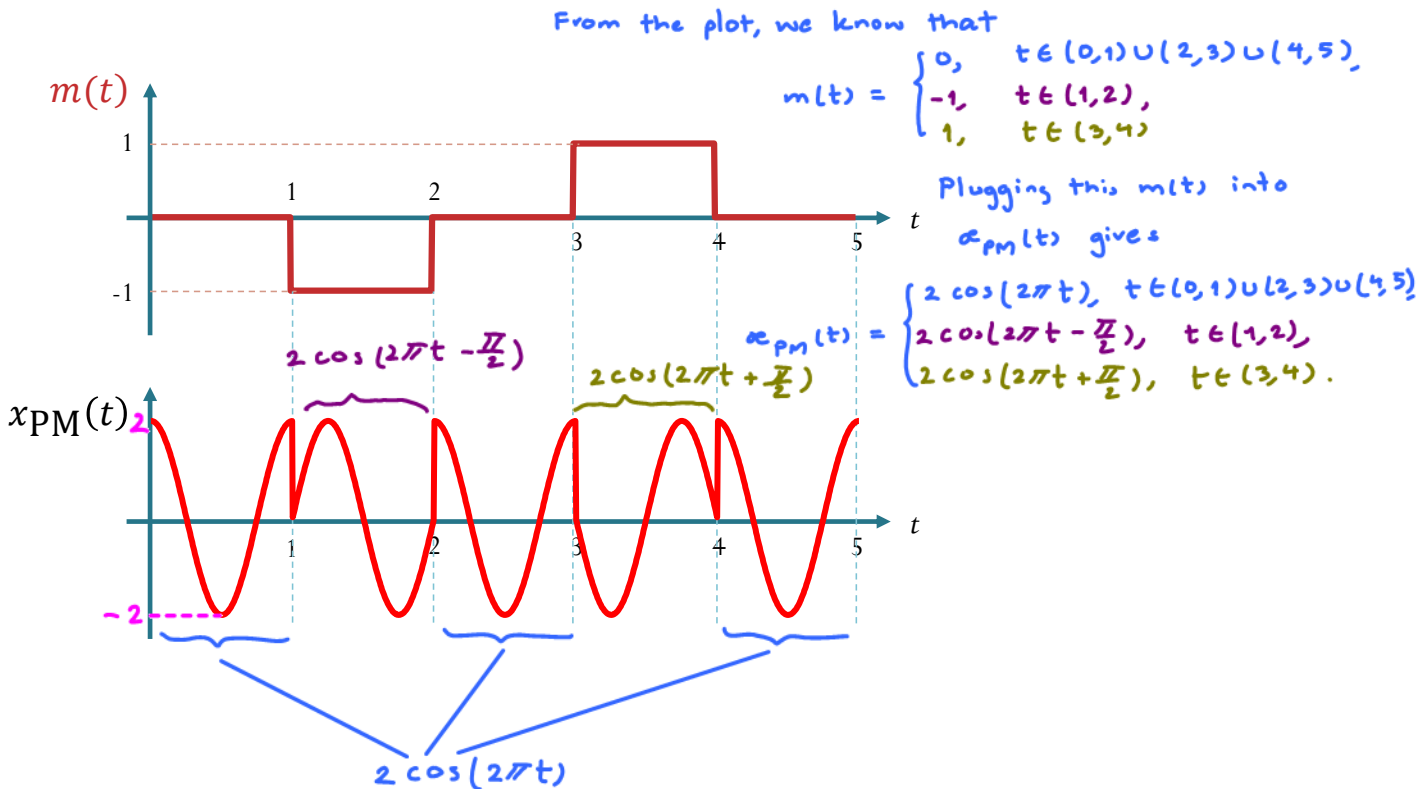
The "freq" of the FM signal should follow the value of $m(t)$.

For example, the time when the FM signal has the highest frequency should correspond to the time when $m(t)$ has highest value.

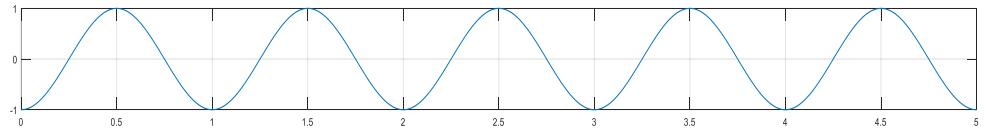
$x_{FM}(t) :$ $x_2(t)$

2. A PM signal is created from the message $m(t)$ by $x_{PM}(t) = 2\cos(2\pi f_c t + k_p m(t))$.

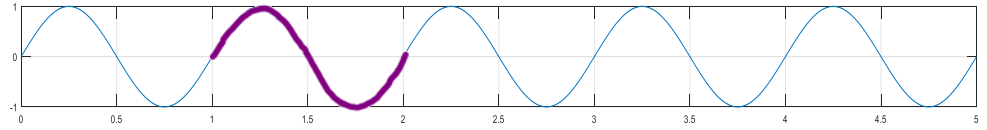
Suppose $f_c = 1$ and $k_p = \frac{\pi}{2} = 90^\circ$. For the message $m(t)$ plotted below. Plot the corresponding $x_{PM}(t)$.



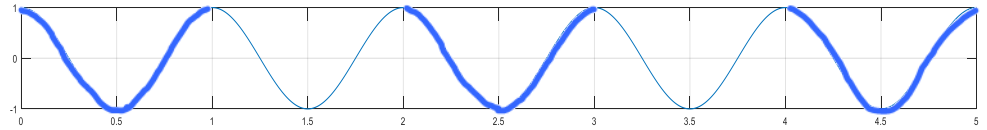
$$\cos(2\pi t - 180^\circ)$$



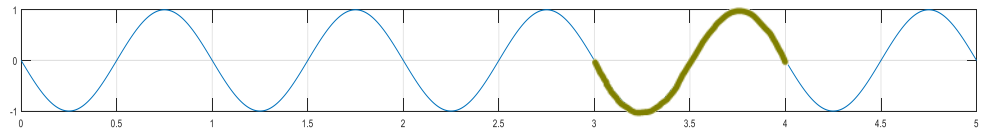
$$\cos(2\pi t - 90^\circ)$$



$$\cos(2\pi t)$$



$$\cos(2\pi t + 90^\circ)$$



$$\cos(2\pi t + 180^\circ)$$

