

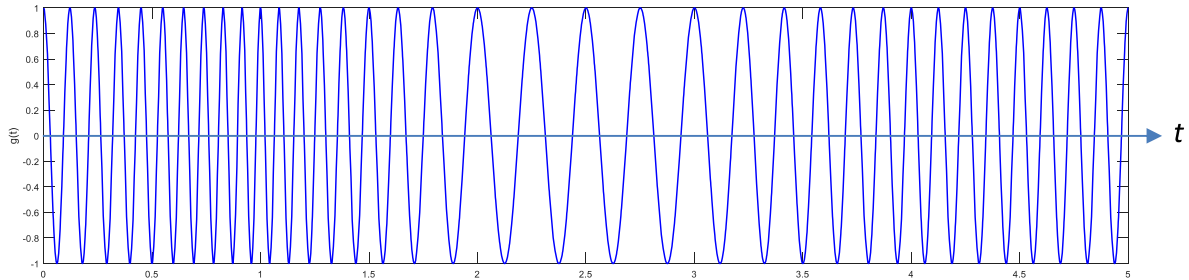
# ECS 332: In-Class Exercise # 8

## Instructions

1. Separate into groups of no more than three persons.
2. **The group cannot be the same as any of your former groups.**
3. Only one submission is needed for each group.
4. 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.
5. **Do not panic.**

Date: <b>03 / 11</b> / 2017		
Name	ID (last 3 digits)	
<b>Prapun</b>	<b>5</b>	<b>5</b>

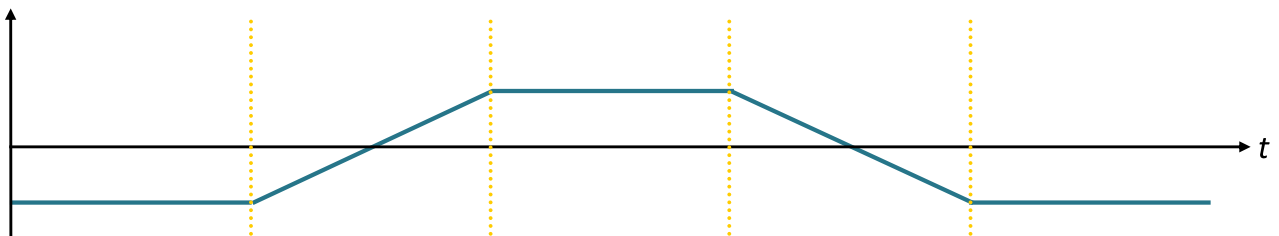
1. Look at the plot of a generalized cosine function  $g(t)$  below.



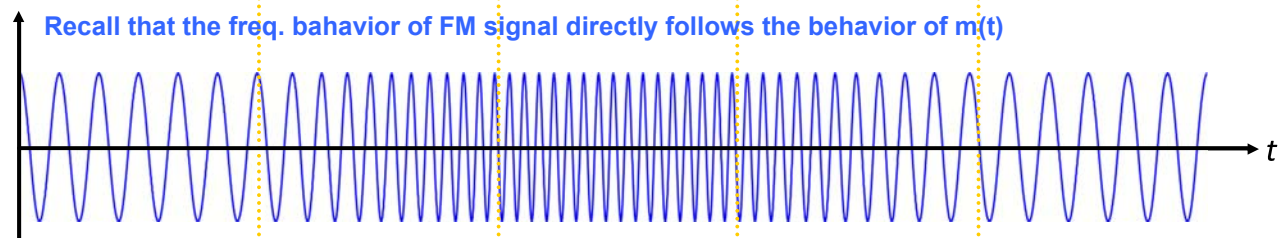
During each of the time intervals below, the frequency is either “constant”, “increasing”, or “decreasing”. Choose the appropriate frequency behavior during each interval.

	Time Interval	Frequency Behavior (“constant”, “increasing”, or “decreasing”?)
(a)	$0 < t < 1$	<b>increasing</b> <small>Note that the number of cycles during the interval <math>[0, 0.5]</math> is less than the number of cycles during the interval <math>[0.5, 1]</math></small>
(b)	$1 < t < 2$	<b>decreasing</b>
(c)	$2 < t < 3$	<b>constant</b>
(d)	$3 < t < 4$	<b>increasing</b>
(e)	$4 < t < 5$	<b>constant</b>

2. Suppose  $m(t)$  is plotted below.



Sketch the corresponding FM signal  $x_{FM}(t)$ . Make sure that the frequency behavior is illustrated clearly.



- Recall that the freq. behavior of FM signal directly follows the behavior of  $m(t)$
- |   |  |  |  |  |
|---|--|--|--|--|
| <p><math>m(t)</math> is constant during this interval. Therefore, the frequency should be constant during this interval.</p> <p><math>m(t)</math> is at its min value during this interval. Therefore, the freq. should be lowest in this interval.</p> | <p><math>m(t)</math> is increasing during this interval. Therefore, the frequency should be increasing during this interval.</p> | <p><math>m(t)</math> is constant during this interval. Therefore, the frequency should be constant during this interval.</p> <p><math>m(t)</math> is at its max value during this interval. Therefore, the freq. should be highest in this interval.</p> | <p><math>m(t)</math> is decreasing during this interval. Therefore, the frequency should be decreasing during this interval.</p> | <p><math>m(t)</math> is constant during this interval. Therefore, the frequency should be constant during this interval.</p> <p><math>m(t)</math> is at its min value during this interval. Therefore, the freq. should be lowest in this interval. Note that the freq. should be the same as during the first interval.</p> |
|---|--|--|--|--|