

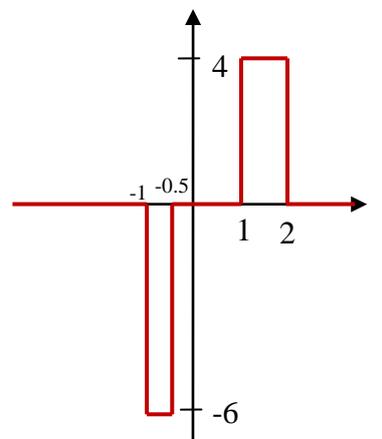
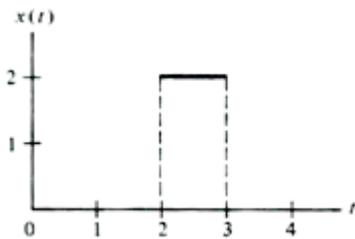
Name: **Key**

Ver.1

Mention three reasons for Modulation?

- 1) For sending many signals (Frequency division Multiplexing)
- 2) To control the antenna size, for wireless applications
- 3) To control the propagation characteristics

Given the following signal  $x(t)$ . Sketch  $2x(t+1)-3x(1-2t)$



Sketch the double sided spectra of the following signal

$$g(t) = 2 + 3\cos\left(2t + \frac{\pi}{4}\right) + \sin\left(4t - \frac{\pi}{4}\right)$$

$$g(t) = 2 + 3\cos\left(2t + \frac{\pi}{4}\right) + \cos\left(4t - \frac{\pi}{4} - \frac{\pi}{2}\right)$$

Convert sine to cosine and then proceed with the two sketches

You must indicate the x-axis ( $n, f$ , or  $\omega$ ) and the important point.

It is  $\omega$  the deltas will be at 0, 2, and 4 and it is  $n$  the deltas will be at 0, 1, and 2 (assumed  $\omega_0=2$ )

What is the root mean squared value (r.m.s) of the signal,  $g(t)$

$$\text{Power} = 4 + 9/2 + 1/2 = 9 \Rightarrow \text{r.m.s} = \sqrt{9} = 3$$