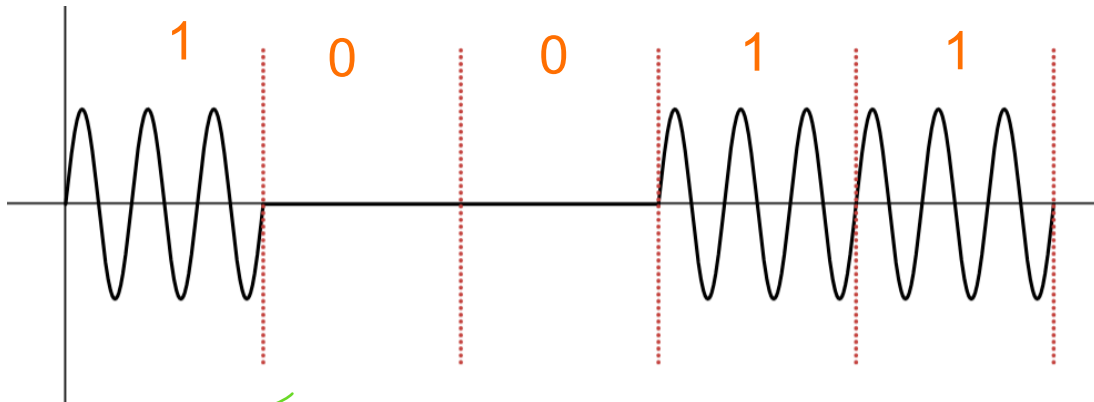


Marks: 15	<b>CSE320: Data Communication</b>	Assignment 3
ID:	Name:	Section:

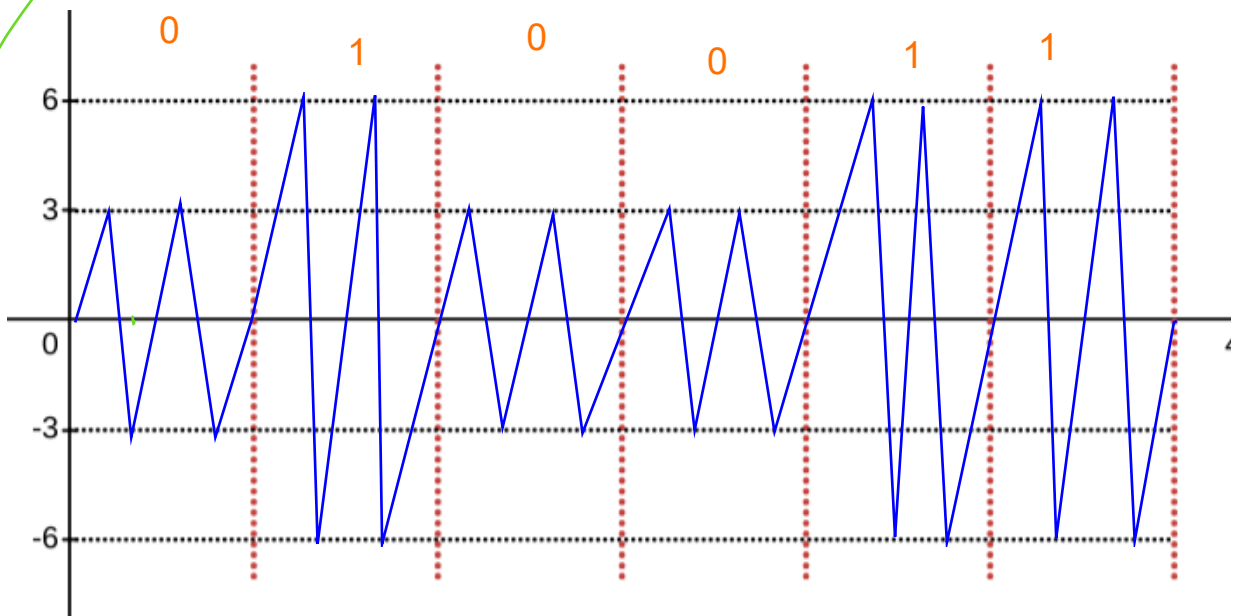
## Amplitude Shift Keying (ASK)

### Binary ASK:

- Determine the digital bit stream from the analog signal below. The signal was modulated using Binary ASK where 0 means signal element with no amplitude and 1 means signal element with amplitude of 3v.

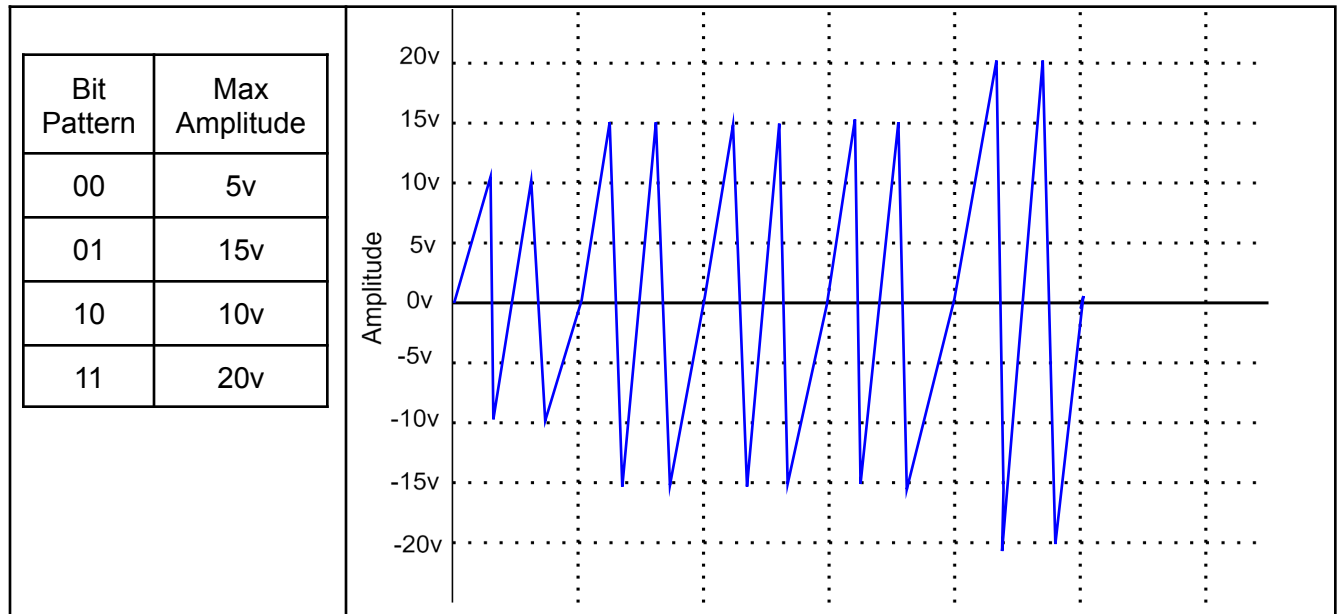


- Draw the analog signal for the digital bit stream 010011 using Binary ASK where 0 means signal element with amplitude of 3v and 1 means signal element with amplitude of 6v.  
[ frequency = 2 for each signal element and phase 0 rad]

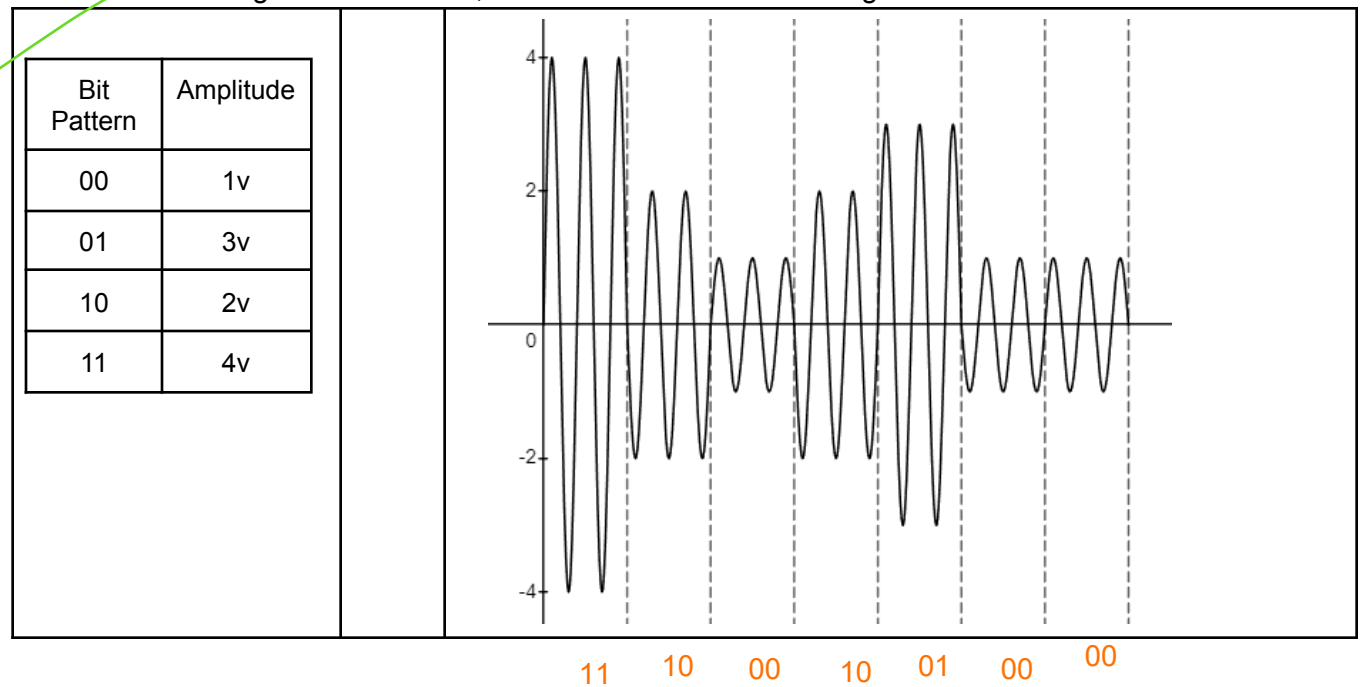


## Multi-level ASK

3. In a Multi level ASK, for each signal element, we want to send 2 bits at a time. We have used a carrier signal that has a frequency of 10 Hz (Each signal element has 2 cycles) and phase is 0 rad. If the amplitude changes according to the following table, draw the modulated signal for the bit sequence 1001010111



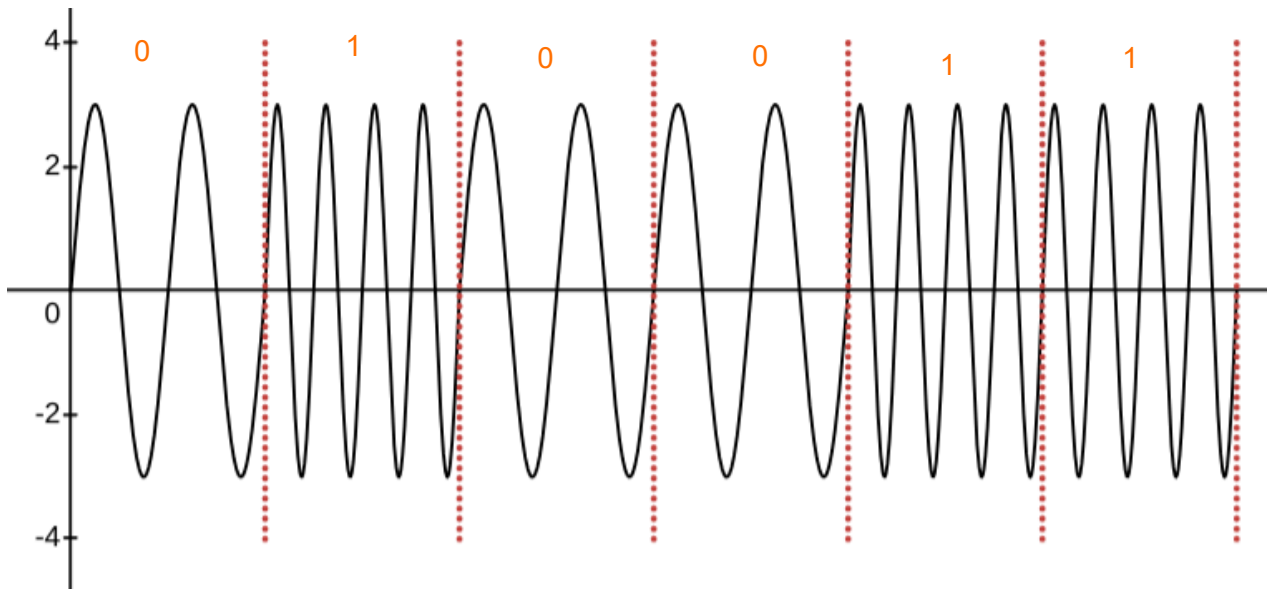
4. For the following Multi-level ASK, find the bitstream form the signal below:



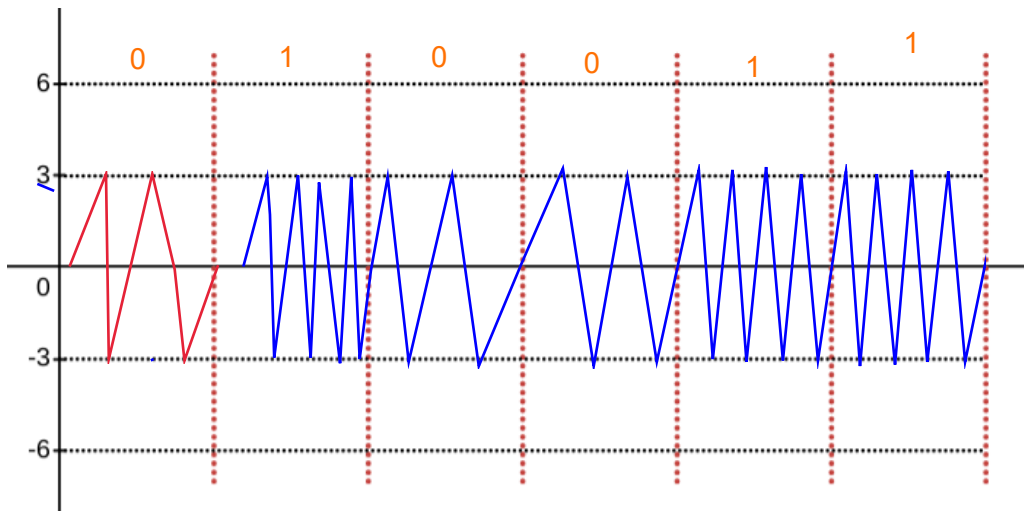
# Frequency Shift Keying (FSK)

## Binary FSK:

5. Determine the digital bit stream from the analog signal below. The signal was modulated using Binary FSK where 0 means signal element with frequency of 2 and 1 means signal element with frequency of 4.

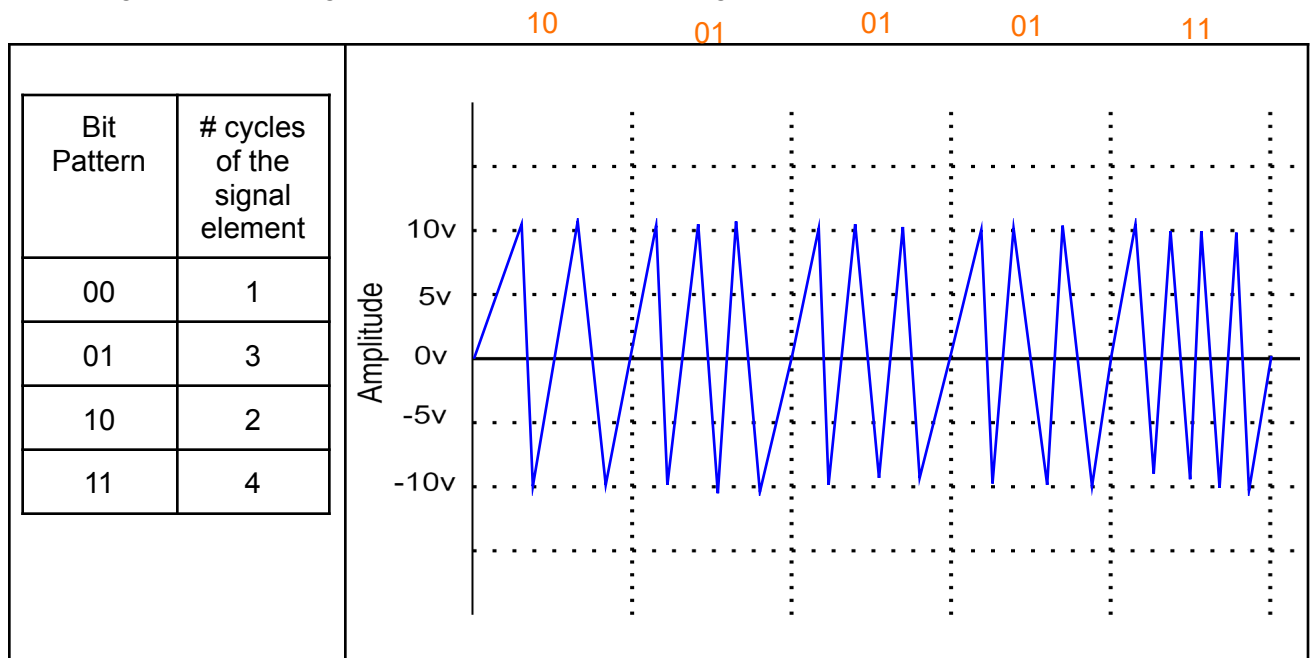


6. Draw the analog signal for the digital bit stream 010011 using Binary FSK where 0 means signal element with frequency of 2 and 1 means signal element with frequency of 4.  
[ Amplitude = 3v and phase 0 rad]

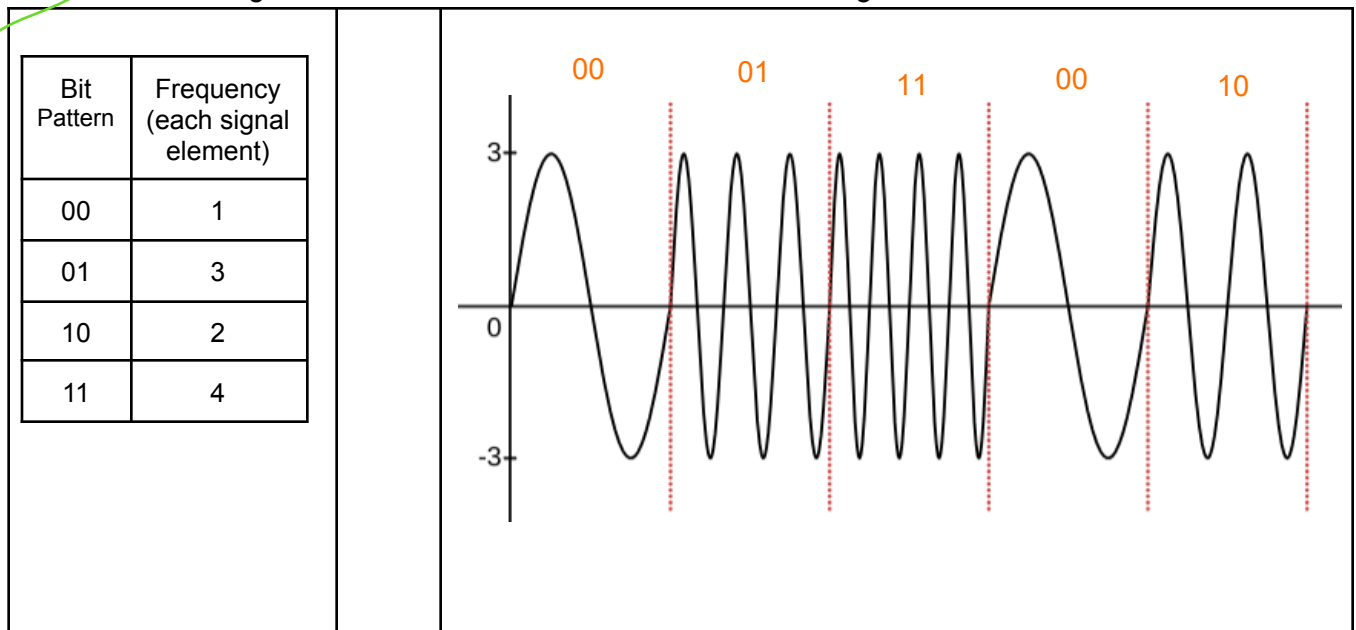


## Multi level FSK

7. In a Multi level FSK, for each signal element, we want to send 2 bits at a time. We have used a carrier signal that has an amplitude of 10v and phase is 0 degree. If the frequency changes according to the following table, draw the modulated signal for the bit sequence 1001010111



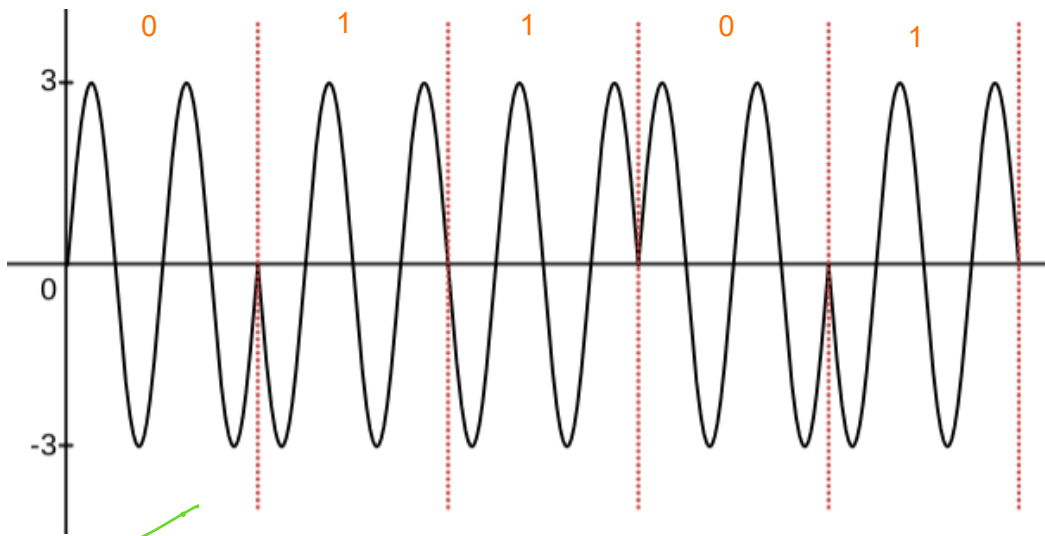
8. For the following Multi-level FSK, find the bitstream form the signal below:



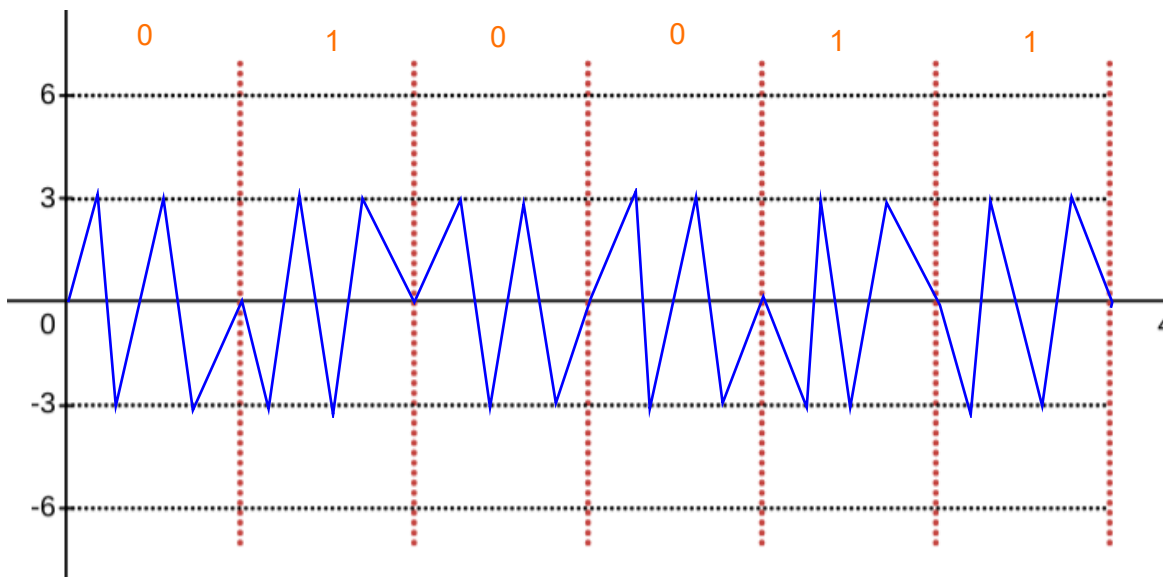
# Phase Shift Keying (PSK)

## Binary PSK

9. Determine the digital bit stream from the analog signal below. The signal was modulated using Binary PSK where 0 means signal element with phase of 0 rad and 1 means signal element with phase of  $\pi$  rad.

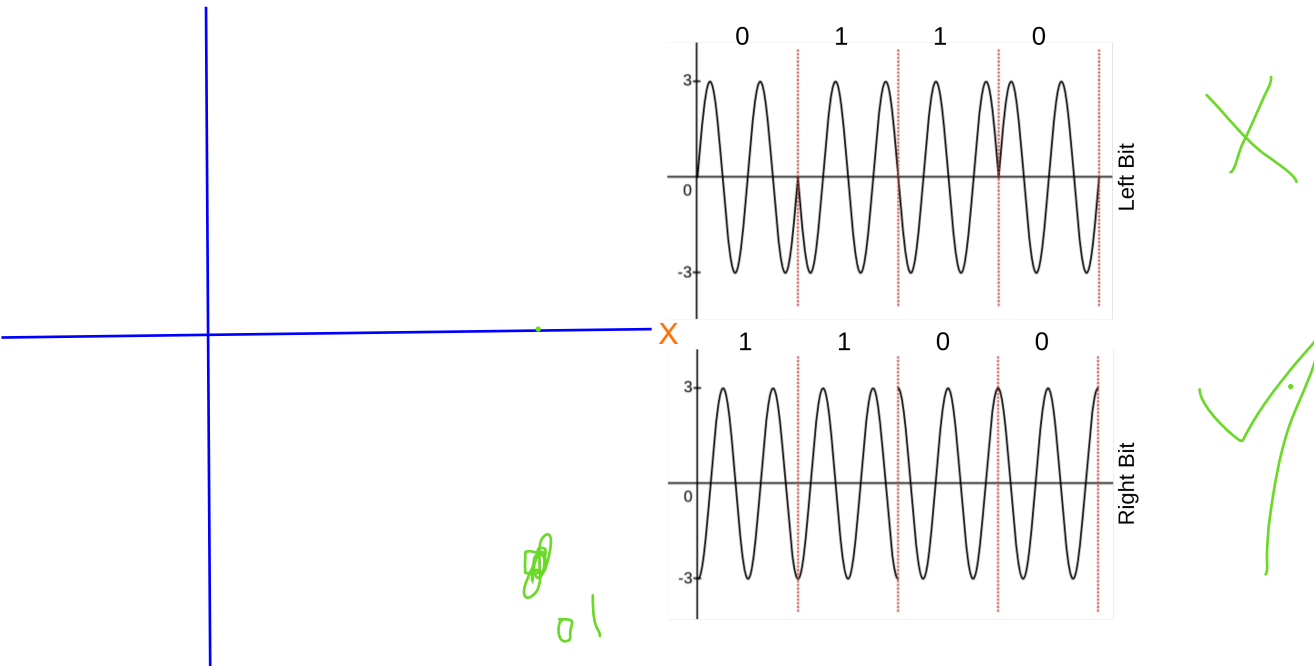


10. Draw the analog signal for the digital bit stream 010011 using Binary PSK where 0 means signal element with phase of 0 rad and 1 means signal element with phase of  $\pi$  rad.  
[ Amplitude = 3v and freq = 2 (for each signal element)]



## QPSK & Constellation Diagram:

Y 11. Draw the constellation diagram for the QPSK given below:



12. Draw the analog signal for the bit stream 1011001011 using the constellation diagram given below [frequency = 2 for each signal element]

