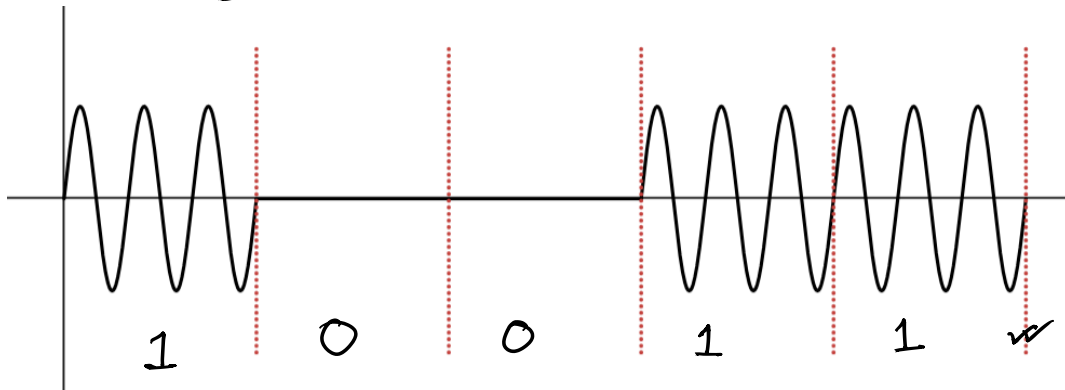


Marks: 15	CSE320: Data Communication	Assignment 3
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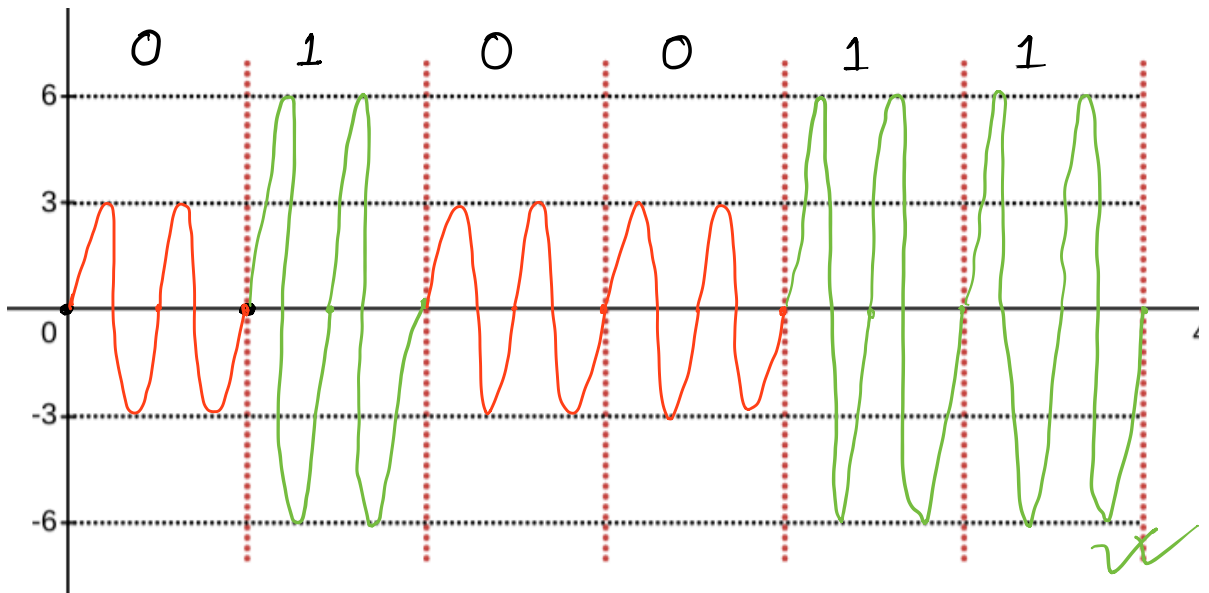
Amplitude Shift Keying (ASK)

Binary ASK: ✓

1. 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.

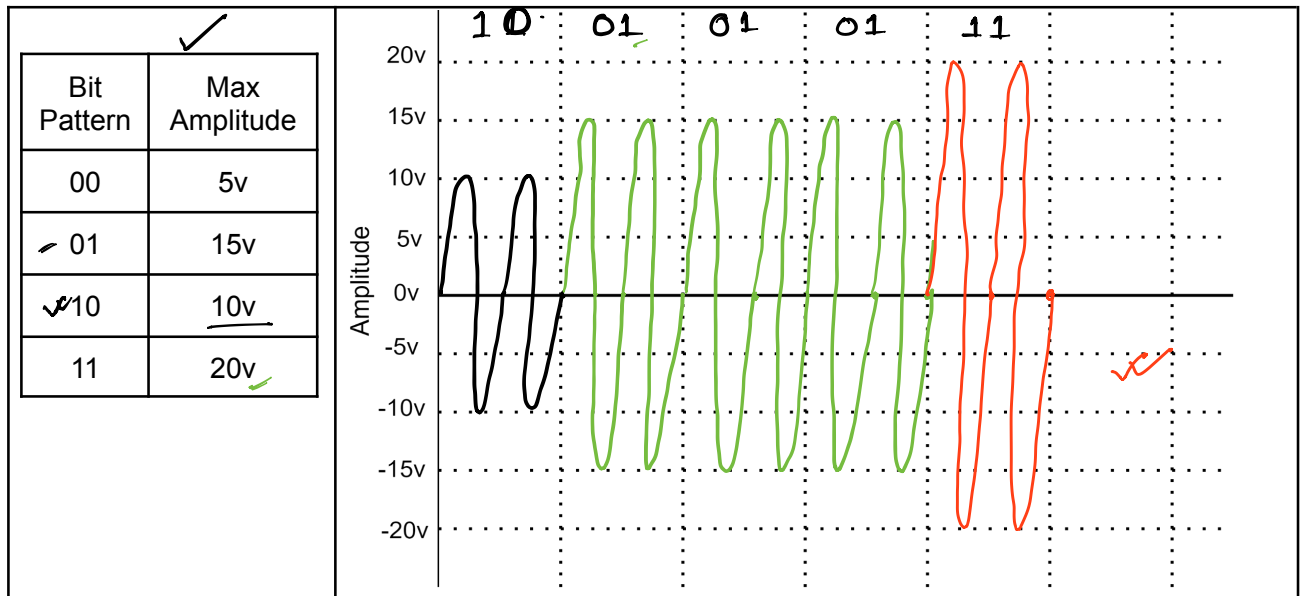


2. Draw the analog signal for the digital bit stream 010011 using Binary ASK where 0 means signal element with amplitude of 3v and 1 means signal element with amplitude of 6v. [frequency = 2 for each signal element and phase 0 rad]

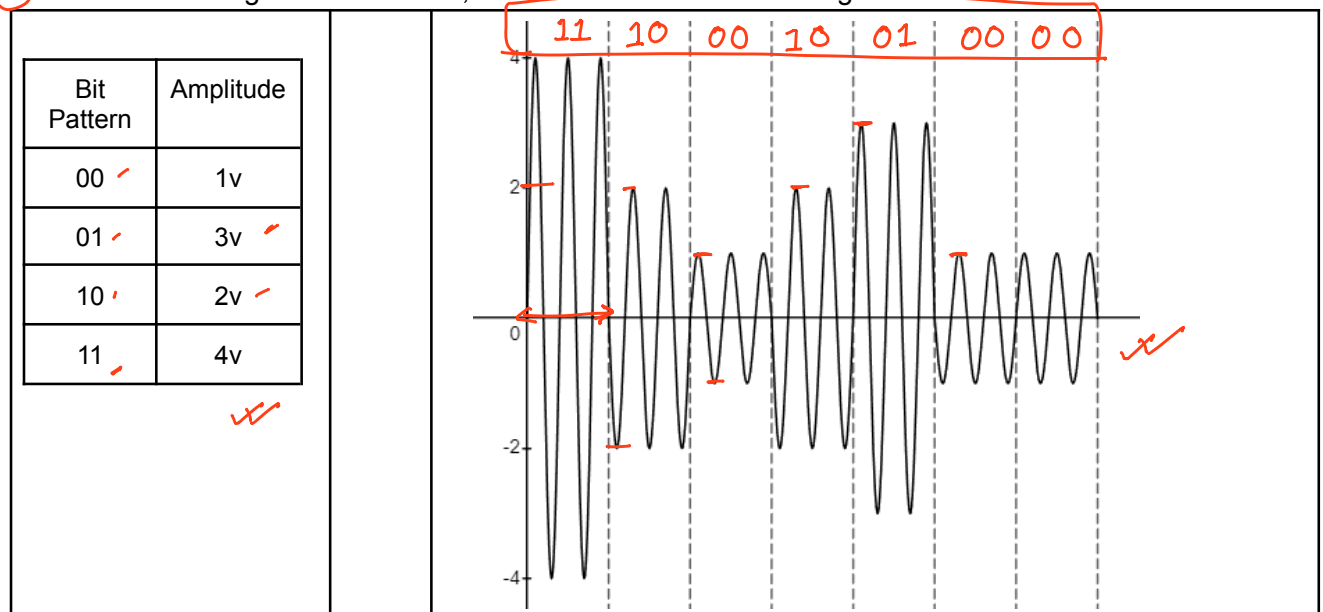


Multi-level ASK

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.



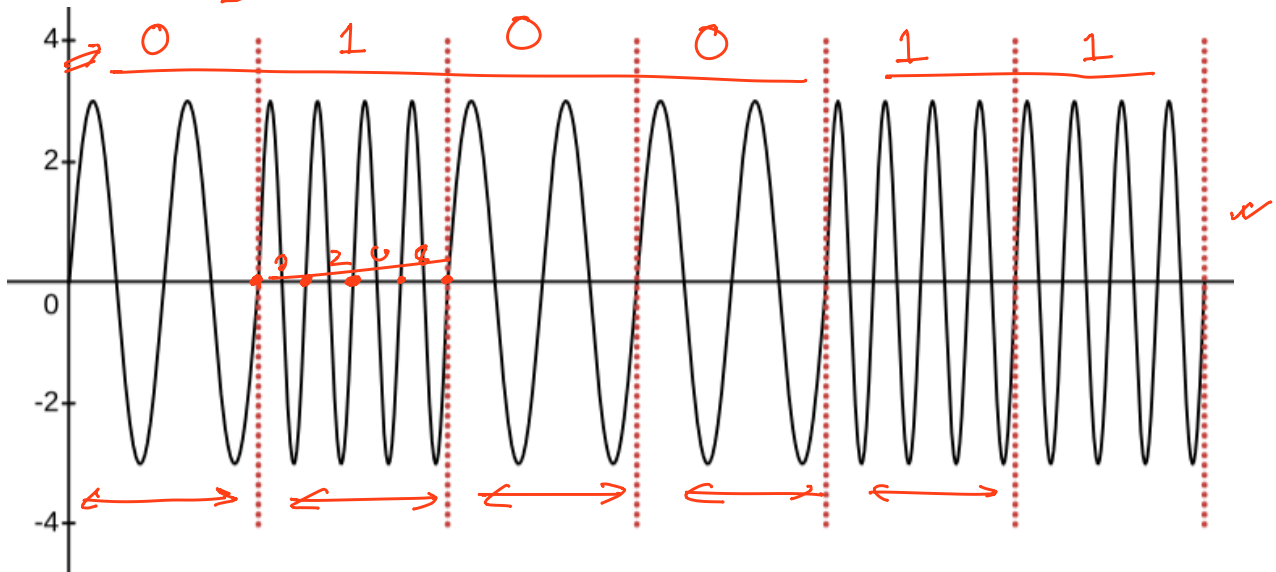
4. For the following Multi-level ASK, find the bitstream from the signal below:



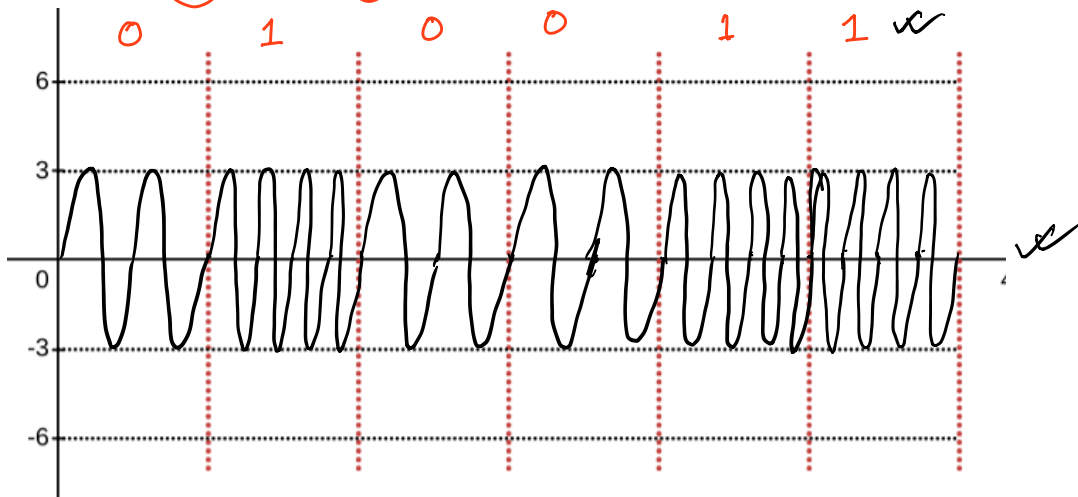
Frequency Shift Keying (FSK)

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.

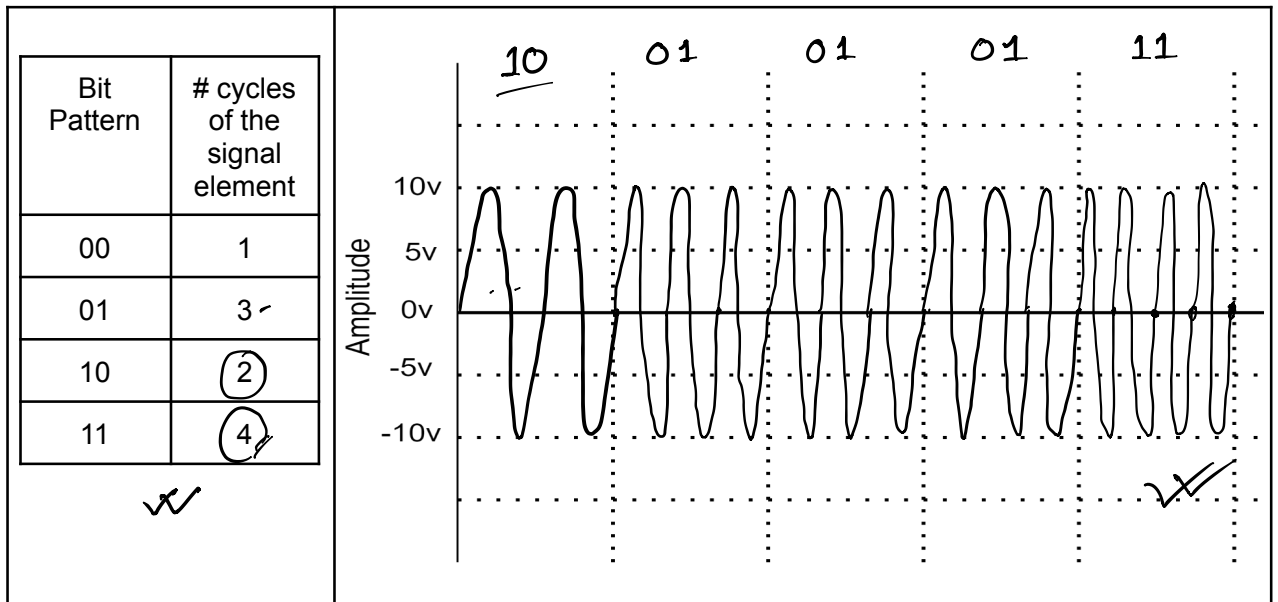


- ⑥ Draw the analog signal for the digital bit stream 010011 using Binary FSK where 0 means signal element with frequency of 2 and 1 means signal element with frequency of 4.
[Amplitude = 3v and phase 0 rad]

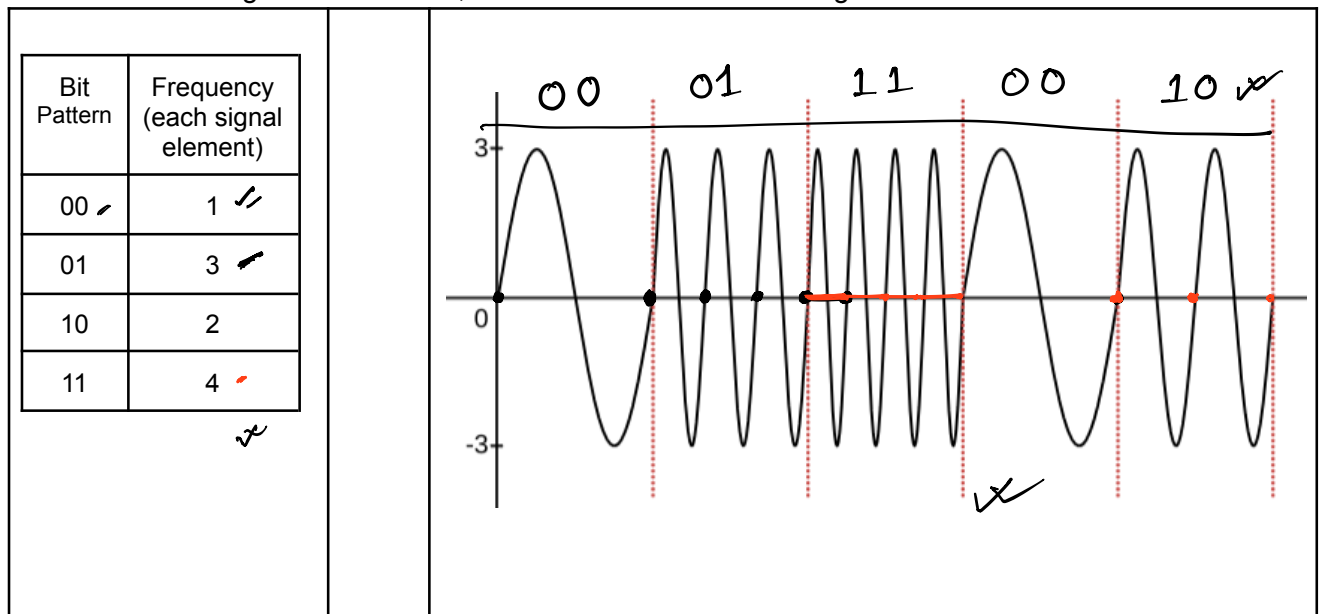


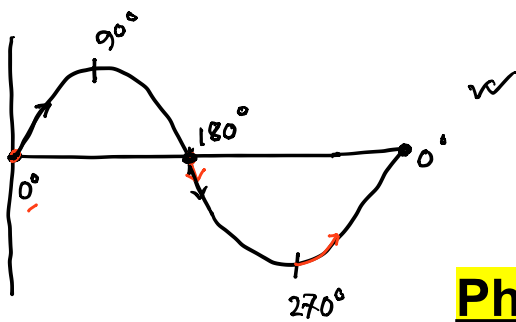
Multi level FSK

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:



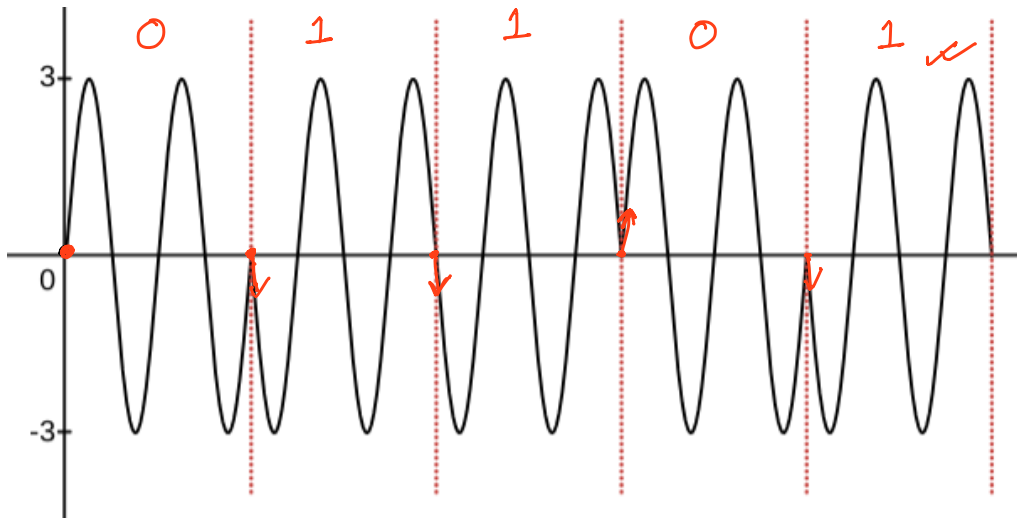


$$\pi = 180^\circ$$

Phase Shift Keying (PSK)

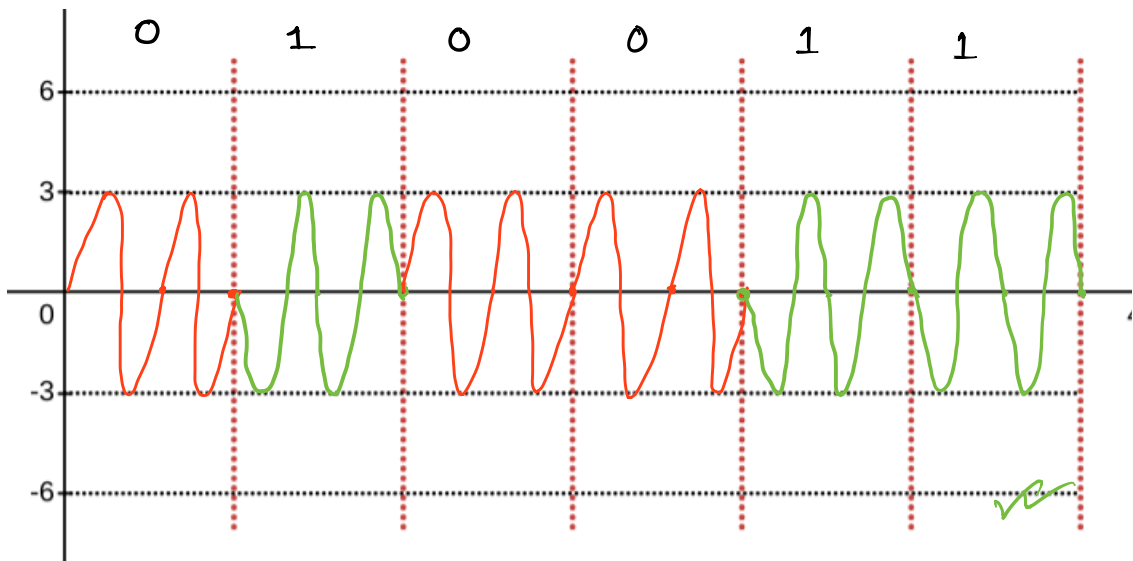
Binary PSK ✓

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 π rad. 180°



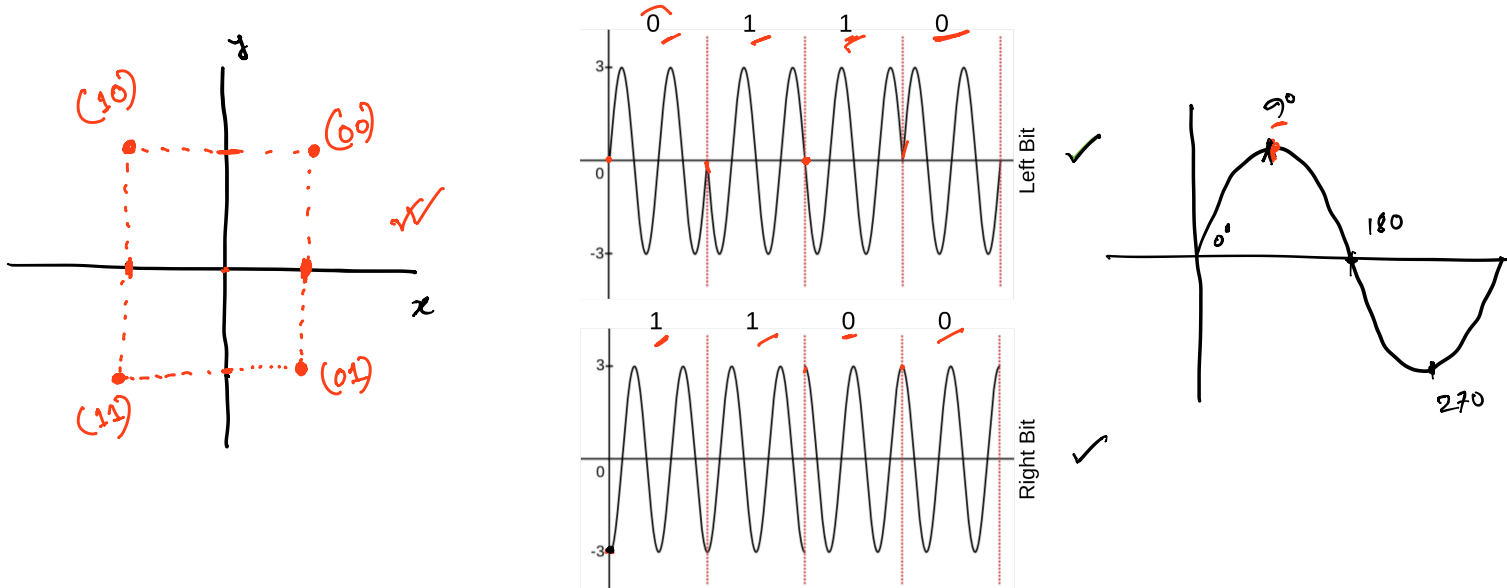
10. Draw the analog signal for the digital bit stream 010011 using Binary PSK where 0 means signal element with phase of 0 rad and 1 means signal element with phase of π rad.
[Amplitude = 3v and freq = 2 (for each signal element)]

$$\begin{aligned} 0 &- 0^\circ \\ 1 &- \pi / 180^\circ \end{aligned}$$



QPSK & Constellation Diagram:

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]

