Name: _____ Sec: _____ ID: _____

Question 1: The following is a waveform produced by applying ASK on a carrier frequency. The high peak amplitudes are bit 1 whereas the low ones are bit 0. Bit duration is 0.005s.

- What is the carrier frequency of this signal? [1]
- Compute the bit pattern transmitted by it. You must show how you split up the signal into units or bauds on the diagram and retrieve the bit values. [4]

Question 2: The message 1011 is being sent as a analog signal. The transmission will be via Binary PSK (2-PSK) with peak amplitude given as 5V, frequency as 15Hz and baud rate as 5units/second.
- Draw the waveform of the modulated signal [7]
- Draw the spectrum of the bandwidth requirements of this transmission [3]

Question 1: The following is a waveform produced by applying ASK on a carrier frequency. The high peak amplitudes represent bit 1 and the low ones represent bit 0. [5]

What is the carrier frequency of this signal? Given that the bit duration is 0.005s, compute the bit pattern transmitted by it. You must show how you split up the signal into units or bauds on the diagram and retrieve the bit values.

Since a bit duration is 0.005s, each 0.01s represents 2 bits.
Since a period is 0.0025s, f_c=400Hz, there are two cycles per bit.
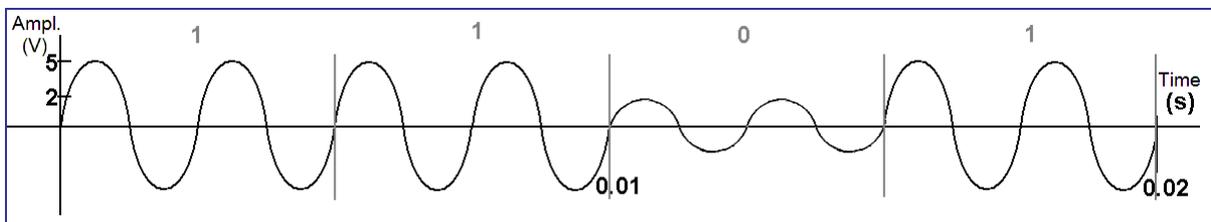
Therefore, the bit pattern is 1 1 0 1

Question 2: The message 1011 is being sent as a analog signal. The transmission will be via BPSK (2-PSK) with peak amplitude 5V, frequency 15Hz and baud rate 5 units/second. Draw the waveform of the modulated signal and its bandwidth requirements. [7+3]

baud rate = 5, so for BPSK bit rate = 5bps, bit duration = 1/5 = 0.2s
*since f_c=15Hz i.e. T=0.0667s, there are 3 cycles for each bit*
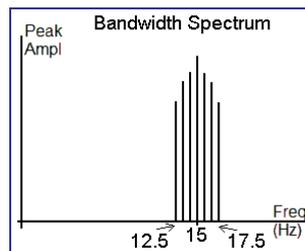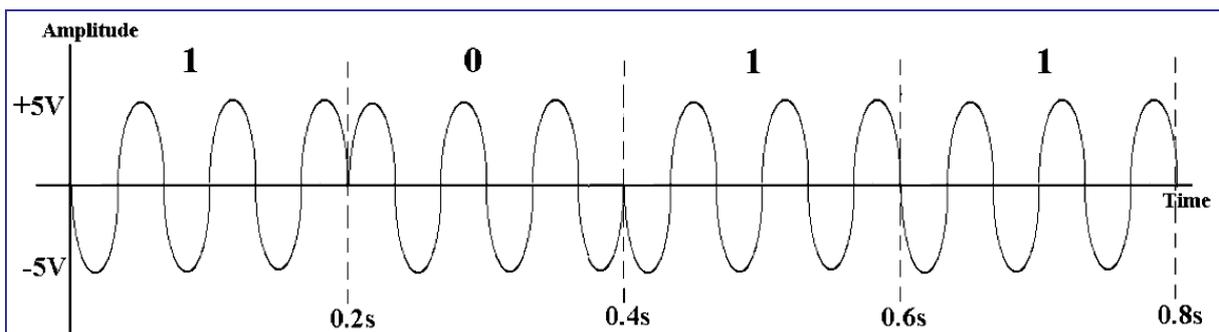
Note: The significant points are $f_c-N_{baud}/2$, f_c and $f_c+N_{baud}/2$

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Question 1: The following is a waveform produced by applying ASK on a carrier frequency. The high peak amplitudes are bit 1 whereas the low ones are bit 0. Bit duration is 0.25s.

- What is the carrier frequency of this signal? [1]
- Compute the bit pattern transmitted by it. You must show how you split up the signal into units or bauds on the diagram and retrieve the bit values. [4]

Qestion 2: The message 1011 is being sent as an analog signal. The transmission will be via FSK with peak amplitude of 5V. The frequency for bit 1 is 10Hz and that for bit 0 is 5Hz. The bit duration is 0.2s.
- Draw the waveform of the modulated signal [7]
- Draw the spectrum of the bandwidth requirements of this transmission [3]

Question 1: The following is a waveform produced by applying ASK on a carrier frequency. The high peak amplitudes represent bit 1 and the low ones represent bit 0. [5]
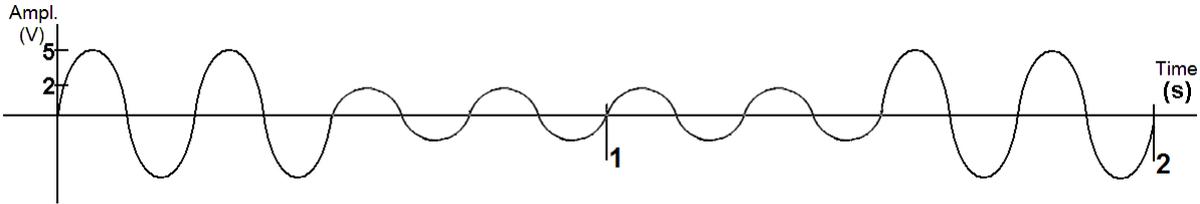
What is the carrier frequency of this signal? Given that the bit duration is 0.25s, compute the bit pattern transmitted by it. You must show how you split up the signal into units or bauds on the diagram and retrieve the bit values.

Since a bit duration is 0.25s, each 1s represents 4 bits,
Since a period is 0.25s, f_c=4Hz, there is one cycle per bit.
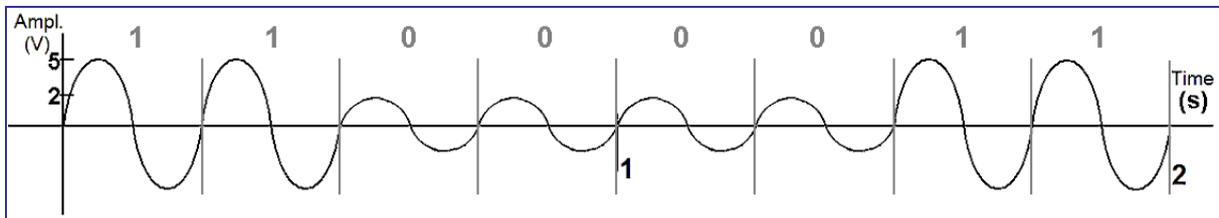
Therefore, the bit pattern is 1 1 0 0 0 0 1 1

Question 2: The message 1011 is being sent as an analog signal. The transmission will be via FSK with peak amplitude 5V. Frequency for bit 1 is 10Hz, bit 0 is 5Hz and the bit duration is 0.2s. Draw the waveform of the modulated signal and its bandwidth requirements. [7+3]

bit duration = 0.2s, f_{c1}=10Hz so T_1=0.1 i.e. 2 cycles for bit 1
bit duration = 0.2s, f_{c0}=10Hz so T_0=0.2 i.e. 1 cycle for bit 0
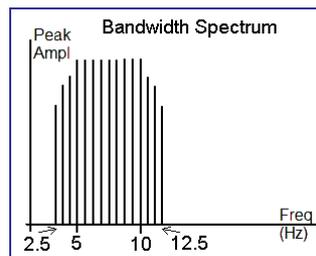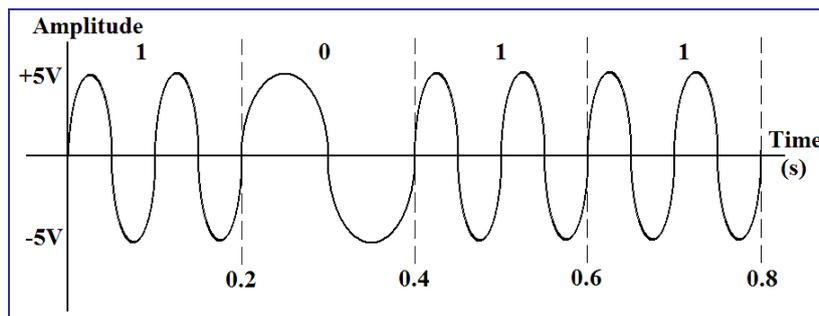
Note: Since bit duration is 0.2s for FSK, N_{baud} = 1/0.2 = 5
The significant points are f_{c0}-N_{baud}/2, f_{c0}, f_{c1} and f_{c0}+N_{baud}/2