

Name: _____

EE432 Fall 2011 Quiz 2

1. An A/D system has a sample rate of 14 kHz. A sinusoid is input for sampling that has a frequency of 10.25 kHz. Did aliasing occur? What is the frequency of the sinusoid that leaves the A/D?
2. An A/D system has a sample rate of 50 kHz. A sinusoid is input for sampling that has a frequency of 31 kHz. Will any sinusoid that comes out have a frequency in the Nyquist range? If not, why not? If so, why?
3. A signal with max frequency content 1700 Hz is sampled at 1500 Hz, what is the Nyquist frequency and the Nyquist range?
4. What is the purpose of an anti-imaging filter in a DSP system?
5. If an A/D has a fixed sample frequency of 16 MHz, what is the max frequency that can ever possibly come out of the A/D?
6. An analog signal has a voltage range of -23 V to +16 V. If it is sampled using a 4-bit quantizer, what is the resolution of the quantizer? What is the smallest max quantization error if the quantizer is designed properly?

7. Design a 2-bit quantizer for an analog signal that has a voltage range of -3 V to +9 V. Ensure there are no “wasted” voltage levels (i.e., design for the actual voltage range of the analog signal). Fill in the following table:

Digital code (bits)	Decimal Value	Quantization Level (Voltage)

Bonus: Who were the two countries that fought in the Falklands war in 1982? Hint: it was the year I graduated from USNA.