Name: _____

EE432 Fall 2011 Quiz 3

1. An A/D system has a sample rate of 37 kHz. A sinusoid is input for sampling that has a frequency of 73 kHz. Did aliasing occur? What is the frequency of the sinusoid that leaves the A/D?

2. A signal with max frequency content 1.700 GHz is sampled at 1200 Hz, what is the Nyquist frequency and the Nyquist range?

3. An analog signal has a voltage range of -2 V to +14 V. If it is sampled using an 8-bit quantizer, what is the resolution of the quantizer? What is the smallest max quantization error if the quantizer is designed properly?

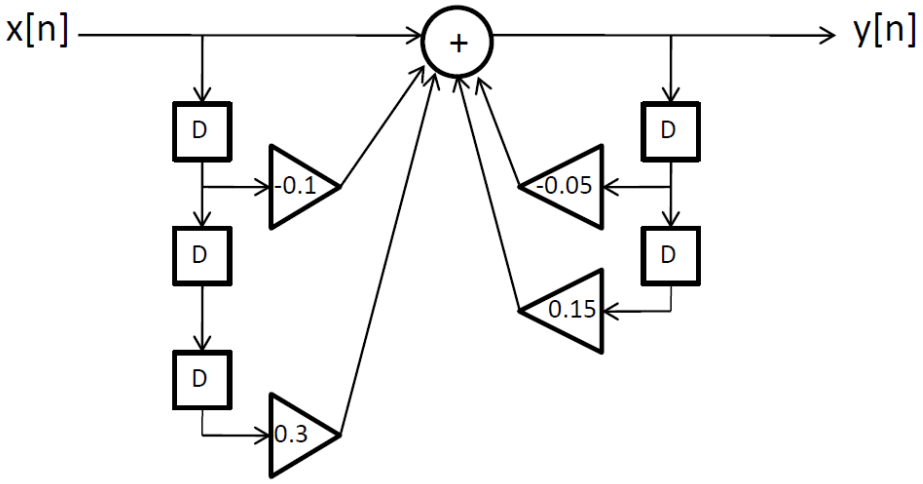
4. Design a 3-bit quantizer for an analog signal that has a voltage range of -3 V to +13 V. Ensure there are no "wasted" voltage levels (i.e., design for the actual voltage range of the analog signal), and has the minimum max quantization error. Fill in the following table:

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

5. Draw a block diagram of the system represented by the following difference equation. Is it a recursive or non-recursive system and why?

$$2y[n] = 2x[n] - 0.4x[n-2] + 0.5x[n-3]$$

6. What is the difference equation corresponding to the following block diagram? Is it a recursive or non-recursive system and why?



Bonus: Who were the two countries that fought in the battle of Dien Bien Phu, and who won?