Homework 3

ME 240: Fundamentals of Instrumentation & Measurement

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1. (2 points) Convert the decimal number 145 to 8-bit simple binary.
2. (2 points) How many bits are required to represent the decimal number 12,034 in simple binary?
3. An 8-bit A/D converter has an input range of 0 to 10 V and an output in simple binary. Find the output (in decimal) if the input is
   (a) (2 points) 5.75 V
   (b) (2 points) -5.75 V
   (c) (2 points) 11.5 V
   (d) (2 points) 0 V
4. (2 points) A 16-bit A/D converter has an input range of 0 to 5 V. Estimate the quantization error (as a percent of reading) for an input of 1.36 V.
5. An A/D converter has an input range of ± 10 V. If the input is 8.0 V, what is the quantization error in volts and as a percent of input voltage if the converter has
   (a) (2 points) 8 bits?
   (b) (2 points) 12 bits?
   (c) (2 points) 16 bits?