

KNOWLEDGE PROBE 1: Review of Analog-to-Digital Conversion Data Conversion Part 2

Learning Objectives

1. Explain the concepts of data conversion.
 2. Define sampling rate, aliasing, and resolution.
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1. How can the binary output of an ADC be used?
 - a. Stored in RAM
 - b. Stored on a PC hard drive
 - c. Transmitted via a network or the Internet
 - d. All of the above
 2. The procedure of momentarily measuring the input analog wave at regular intervals is known as
 - a. Quantization
 - b. Sampling
 3. The term quantization means
 - a. Momentarily measuring the input analog wave at regular intervals
 - b. Converting a measured sample into a proportional binary code
 - c. Reducing the noise on the analog signal before conversion
 - d. Sampling at a rate twice the highest frequency content of the signal
 4. The Nyquist theorem states that
 - a. All analog inputs are made up of a fundamental signal and multiple harmonics
 - b. The analog signal must be sampled at least half the highest frequency of the input
 - c. The analog signal must be sampled at least twice the highest frequency of the input
 - d. The resolution is $1/2^N$
 5. If a voice signal with a maximum frequency of 4 kHz is sampled at a rate of 6.5 kHz, what is the frequency of the recovered signal?
 - a. 2.5 kHz
 - b. 4 kHz
 - c. 6.5 kHz
 - d. 10.5 kHz
 6. The resolution of an ADC is defined by the
 - a. Number of bits
 - b. Reference voltage value
 - c. Sampling rate
 - d. Signal to noise ratio



7. An 8-bit ADC has a resolution of
 - a. 0.1953 %
 - b. 0.39 %
 - c. 0.43 %
 - d. 0.88 %

8. An 8-bit ADC has an input voltage range of 0 to 3 volts. What is the resolution?
 - a. 3.3 mV
 - b. 8.0 mV
 - c. 11.7 mV
 - d. 375.0 mV

9. Which of the following is used to define resolution?
 - a. Converting the measured sample voltage into a proportional binary code
 - b. Measuring the analog signal for a short instant at fixed time intervals
 - c. The fineness of amplitude definition or representation
 - d. The process of taking an analog signal and converting it into a sequence of fixed length and proportional binary numbers