

### Unit 3 and 4 Assessment

1. An 8 bit ADC may have how many unique output conditions?
  - A.  $12^8$
  - B.  $2^8$
  - C. 16
  - D.  $2^{16}$
  - E.  $2^{12}$
  
2. Fill in the blank. A 3dB attenuator and a 6dB attenuator in series provide a total attenuation of \_\_\_\_\_.
  - A. 18dB
  - B. 27 dB
  - C. 3 dB
  - D. 9 dB
  - E. 12 dB
  
3. Which of the following is true of a current source?
  - A. A current source is the closest voltage supply to the load.
  - B. A current source can supply an infinite current.
  - C. A current source supplies a constant current regardless of voltage.
  - D. A current source can supply alternating current.
  - E. A current source is the farthest voltage supply from the load.
  
4. Which of the following is true of a digital signal?
  - A. A digital signal takes on discrete values over a finite range.
  - B. A digital signal is represented by 10 bits of data.
  - C. A digital signal is represented by numbers ranging from 1 to 100.
  - D. A digital signal is represented by 10.
  - E. None of the above
  
5. A filter separates signals based upon which of the following?
  - A. Intensity
  - B. Current
  - C. Voltage
  - D. Frequency
  - E. Duration
  
6. A low-pass filter permits the passage of which of the following?
  - A. Small voltages
  - B. Small currents
  - C. Low frequency signals
  - D. DC signals
  - E. Both C and D
  
7. Fill in the blank. A power gain of 20 dB corresponds to a factor of \_\_\_\_\_.

- A. 2000
- B. 1000
- C. 10
- D. 20
- E. 100

8. Which of the following best defines a signal (in the context of this course)?

- A. An unexpected event
- B. A detectable quantity used to communicate information
- C. An electrical current
- D. An indication to start or stop an activity
- E. All of the above

9. A simple way to filter out low frequencies is to do which of the following?

- A. Place a capacitor in parallel with the load
- B. Place an inductor in series with the load
- C. Place a rapid switch in series with the load
- D. Place an inductor in parallel with the load
- E. None of the above

10. Fill in the blank. The amplitude of an alternating current signal is often referred to by \_\_\_\_\_.

- A. Period
- B. Peak-to-peak, RMS, or average
- C. Frequency and period
- D. Duration
- E. Frequency

11. Aliasing occurs in signal digitization when which of the following occurs?

- A. A signal is not digitized rapidly enough.
- B. A connection is mislabeled.
- C. A signal is not digitized with enough amplitude resolution.
- D. A signal from outside the intended range contaminates the desired signal because of improper signal conditioning (filtering) before digitization and/or improper digitization.
- E. A signal is digitized too rapidly.

12. Which of the following is true of alternating current?

- A. Alternating current is always positive.
- B. Alternating current oscillates at 60 Hz.
- C. Alternating current changes amplitude and/or direction with time.
- D. Alternating current decays with time.
- E. None of the above

13. The nomenclature “live zero” in the context of signals indicates which of the following?

- A. A jittery digital readout
- B. A non-zero rest state for an analog signal

- C. A sloping baseline
- D. A noisy digital readout
- E. None of the above

14. Which of the following presents a total resistance for three resistors ( $R_1$ ,  $R_2$ ,  $R_3$ ) in series?

- A.  $R_1 + R_2 + R_3$
- B.  $R_1 \times R_2 \times R_3 / (R_1 + R_2 + R_3)$
- C.  $R_1/R_2 + R_2/R_3 + R_3/R_1$
- D.  $1/R_1 + 1/R_2 + 1/R_3$
- E. None of the above

15. Which of the following best describes an analog signal?

- A. An analog signal is measured by voltage.
- B. An analog signal is determined continuously in time.
- C. An analog signal is continuously variable over a range.
- D. An analog signal is measured in units of electrical current or flow rate.
- E. An analog signal makes on a finite number of discrete values.