

*If you miss more than 3, you are a good candidate for the
Fundamentals of Mixed Signal Testing class.*

1. The term “resolution” is typically used to describe which of the following DAC characteristics?
 - a) Voltage Range
 - b) Accuracy
 - c) Number of Bits
 - d) Maximum Clock Frequency
2. The sine of an angle in a right triangle is the ratio of sides given by:
 - a) Opposite over adjacent
 - b) Opposite over hypotenuse
 - c) Adjacent over hypotenuse
 - d) Adjacent over opposite
3. Sampling can be used to get information about all of the following *except*:
 - a) Signal Amplitude
 - b) Nyquist frequency of a signal
 - c) Magnitude of a signal at various frequencies
 - d) Phase of a signal at various frequencies
4. What is the “Fourier Frequency”?
 - a) The highest frequency component of a frequency spectrum
 - b) The lowest frequency component of a frequency spectrum
 - c) The frequency of interest in a frequency spectrum
 - d) The frequency resolution of a frequency spectrum
5. Time Windowing functions can be used to reduce:
 - a) Aliasing
 - b) Spectral leakage
 - c) Distortion
 - d) Quantization error
6. The following is a requirement for coherent sampling:
 - a) A high bandwidth waveform digitizer
 - b) An integer number of signal cycles
 - c) Samples from more than one cycle of a signal
 - d) A lowpass filter
7. A filter’s “3dB point” is:
 - a) The frequency at which the signal is completely attenuated
 - b) The frequency at which the signal is not attenuated at all
 - c) The frequency at which half the signal power is attenuated
 - d) The frequency at which half the signal voltage is attenuated

8. Which of the following is *not* a Differential Nonlinearity test method for Analog-to-Digital Converters?
- Servo Loop
 - Segmented Input Ramp
 - Histogramming
 - Thermal Tail
9. A DAC LSB is calculated as:
- $(\text{Full scale output} - \text{zero scale output}) * (2^{\text{bits}} - 1)$
 - $(\text{Full scale output} - \text{zero scale output}) / (2^{\text{bits}} - 1)$
 - $(\text{Full scale output} - \text{zero scale output}) / 2^{\text{bits}}$
 - $(\text{Full scale output} / \text{bits})$
10. A Sine Histogram test is often used to:
- Find superposition problems with R/2R DACs
 - Find distortion problems with sigma-delta ADCs
 - Find noise problems with partially decoded DACs
 - Find sparkling problems with flash ADCs
11. Pi radians equals:
- 45°
 - 90°
 - 180°
 - 360°
12. A low pass filter with 6 poles has a voltage roll-off of:
- 36dB per decade
 - 120dB per octave
 - 120dB per decade
 - 6dB per octave
13. A value of 80dB represents a ratio in volts of
- 10000 : 1
 - 80 : 1
 - 8 : 1
 - 4 : 1
14. The frequency resolution of a spectrum, FF, is given by:
- M / F_t
 - N / F_s
 - $1 / \text{UTP}$
 - All of the above

- 15.** The Fast Fourier Transform uses how many calculations?
- a)** N^2 calculations
 - b)** $(N / 2) \log_2 N$
 - c)** $(N / 2) \log_{10} N$
 - d)** $(N) \log_2 N$
- 16.** For a given F_i and F_s , what is the effect of increasing M ?
- a)** The number of samples N is decreased, leading to lower frequency domain resolution
 - b)** The number of samples N is increased, leading to higher frequency domain resolution
 - c)** The Unit Test Period is decreased, leading to lower test time
 - d)** The Fourier Frequency is increased, leading to higher noise measurements
- 17.** What is a “sparkle code”?
- a)** A glitch in a DAC’s output due to superposition error
 - b)** A glitch in an ADC’s output due to superposition error
 - c)** A glitch in an ADC’s output due to illegal states in the output decoder
 - d)** A glitch in a DAC’s output due to major carry transitions
- 18.** A device LSB for an ADC is calculated from the:
- a)** Zero and full scale measurements
 - b)** Gain measurement
 - c)** Zero and full scale transition measurements
 - d)** Datasheet
- 19.** When using the histogram method to test an ADC, “average hits per code” is analogous to:
- a)** Total number of samples taken
 - b)** DNL
 - c)** Device LSB
 - d)** Tester LSB
- 20.** To use a 12-bit waveform digitizer to dynamically test a 14-bit DAC, you will probably need
- a)** Waveform generator
 - b)** Notch filter
 - c)** Phase locked loop
 - d)** Bandpass filter

To check your answers please visit our web site – the direct link is

http://www.soft-test.com/mixed_signal/answers.htm