

Automotive Electrical and Engine Performance 9th Edition
Chapter 5 – Digital Storage Oscilloscope, Operation and Use
Quiz B

1. What is the primary function of a digital storage oscilloscope (DSO)?
 - a. To measure electrical resistance in a circuit
 - b. To capture, store, and analyze voltage signals over time
 - c. To measure direct and alternating current simultaneously
 - d. To calculate engine load based on voltage signals

2. In a pulse train, what does "duty cycle" measure?
 - a. Frequency of the waveform in cycles per second
 - b. The rise time of the signal waveform
 - c. The percentage of time the signal is active in a complete cycle
 - d. The amplitude variation of the waveform

3. Which waveform characteristic is most affected by adjusting the time base of a scope?
 - a. Voltage amplitude
 - b. Horizontal time scale of the signal
 - c. Vertical display resolution
 - d. Sampling frequency

4. What is the effect of selecting AC coupling on an oscilloscope?
 - a. Blocks DC voltage to display only AC signals
 - b. Allows both AC and DC signals to pass
 - c. Filters high-frequency noise from DC signals
 - d. Displays voltage signals as pulse-width modulation

5. Why is the volts per division setting critical on a scope?
- It determines the waveform's resolution in the time domain
 - It ensures the waveform fits within the display limits
 - It adjusts the sampling rate of the oscilloscope
 - It filters unwanted frequencies in the signal
6. What can cause glitches or "spikes" in a recorded oscilloscope waveform?
- Sampling rates too low for the signal frequency
 - Poor connection to the ground lead
 - Incorrect vertical scaling
 - Ambient electromagnetic interference
7. What is the main advantage of a current clamp used with a scope?
- Measures current flow without circuit disconnection
 - Automatically calculates waveform duty cycle
 - Reduces sampling errors at low current levels
 - Provides real-time voltage calibration
8. What is the purpose of a trigger slope setting on an oscilloscope?
- Determines the waveform's frequency range
 - Activates the scope to display the waveform at a specific voltage direction
 - Adjusts the vertical scaling for precise voltage measurements
 - Synchronizes multiple waveforms on the screen
9. When analyzing a hybrid vehicle's MAP sensor with a DSO, a momentary rise to 5 volts indicates:
- A sudden decrease in manifold vacuum
 - A momentary open circuit in the system
 - Normal signal variation under load
 - A sudden increase in engine speed

10. Which of the following describes a pressure transducer's role in diagnostics?

- a. Converts temperature changes into electrical signals
- b. Measures and displays pressure as electrical waveforms
- c. Tracks AC signal amplitude fluctuations
- d. Synchronizes pressure readings with pulse train signals

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Correct Answers:

1. b
2. c
3. b
4. a
5. b
6. a
7. a
8. b
9. a
10. c