

**Automotive Electrical and Engine Performance 8th Edition**  
**Chapter 13 – Ignition System Operation, Diagnosis, and Service**  
**Quiz A**

1. What is the primary function of the ignition coil in modern ignition systems?
  - a. To create a magnetic field and induce high voltage for spark plug ignition
  - b. To control the timing of the spark in the combustion chamber
  - c. To store and release energy required for secondary circuit operation
  - d. To act as a transformer to regulate ignition voltage
  
2. What is the key difference between waste-spark and coil-on-plug ignition systems?
  - a. Coil-on-plug systems fire one spark plug per cylinder, while waste-spark systems fire two spark plugs simultaneously
  - b. Waste-spark systems use direct current for ignition, while coil-on-plug systems rely on alternating current
  - c. Waste-spark systems do not require a primary circuit for operation
  - d. Coil-on-plug systems are limited to V6 and V8 engines
  
3. What is the purpose of the Hall-effect sensor in ignition systems?
  - a. To measure engine speed and provide signals for PCM adjustments
  - b. To control the opening and closing of the fuel injectors
  - c. To detect electromagnetic interference in the ignition system
  - d. To generate a voltage signal for triggering ignition events
  
4. Why are platinum and iridium used in modern spark plugs?
  - a. They increase durability and resistance to erosion
  - b. They enhance electrical conductivity for stronger ignition sparks
  - c. They reduce ignition system interference with onboard electronics
  - d. They prevent overheating during high engine loads

5. What is the typical turns ratio of primary to secondary windings in an ignition coil?
- a. 50:1
  - b. 80:1
  - c. 100:1
  - d. 120:1
6. Which sensor is primarily responsible for detecting engine knock and adjusting ignition timing?
- a. Crankshaft position sensor
  - b. Camshaft position sensor
  - c. Knock sensor
  - d. Oxygen sensor
7. What is the advantage of a resistor spark plug?
- a. Reduced voltage requirements for ignition
  - b. Suppression of electromagnetic interference (EMI)
  - c. Improved energy transfer to the spark plug tip
  - d. Increased lifespan in high-performance applications
8. What does a waste-spark system rely on to time ignition events?
- a. A Hall-effect sensor on the distributor shaft
  - b. A crankshaft position sensor
  - c. A magnetic pickup coil in the PCM
  - d. A timing belt-driven camshaft sensor
9. Which component in the ignition system is tested by measuring resistance between primary terminals?
- a. Ignition module
  - b. Secondary winding of the ignition coil
  - c. Primary winding of the ignition coil
  - d. Spark plug wires

10. What is a common diagnostic method for a faulty ignition coil?
- a. Measuring the voltage output during cranking
  - b. Observing waveform patterns using an oscilloscope
  - c. Performing a resistance test on the coil's primary and secondary windings
  - d. Using a scan tool to detect misfire codes

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**Correct Answers:**

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