Automotive Electrical and Engine Performance 9th 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