Automotive Electrical and Engine Performance 9th Edition
Chapter 9 – Magnetism and Electromagnetism
Multiple Choice Questions Quiz B

1. What is the function of magnetic flux lines around a magnet?

a) They conduct electrical current through magnetic materials.

b) They create a magnetic field around the magnet.

c) They insulate magnetic fields from surrounding materials.

d) They reduce resistance in magnetic materials.

2. Technician A says that magnetism can be induced in a piece of iron by placing it near a magnet. Technician B says that once induced, the iron always retains some magnetism. Who is correct?

a) Technician A only

b) Technician B only

c) Both Technicians A and B

d) Neither Technician A nor B

3. The strength of an electromagnet is primarily increased by:

a) Decreasing the current flowing through the coil

b) Reducing the number of coil turns

c) Using a higher resistance wire

d) Adding a soft iron core inside the coil

4. What purpose does the left-hand rule serve in understanding electromagnetism?

a) Determining current flow direction in an AC circuit

b) Identifying the magnetic polarity of a magnet

c) Indicating magnetic field direction around a current-carrying conductor

d) Measuring the flux density of a magnetic material

5. Which material is likely to exhibit high permeability, allowing magnetic flux lines to pass through easily?

a) Aluminum

b) Plastic

c) Iron

d) Glass

6. Technician A states that reluctance is the opposition to magnetic flux in a material. Technician B claims that reluctance only exists in non-metallic materials. Who is correct?

a) Technician A only

b) Technician B only

c) Both Technicians A and B

d) Neither Technician A nor B

7. What effect does a cracked magnet in a crankshaft position sensor have on sensor performance?

a) It increases the sensor's voltage output.

b) It divides the magnet into two weaker magnets, reducing output.

c) It has no effect on magnetic strength.

d) It doubles the sensor's magnetic field strength.

8. In a relay, the armature is attracted to the electromagnet when:

a) Current flows through the control circuit coil

b) The load circuit is open

c) The battery is disconnected

d) The circuit has high resistance

9. The purpose of the “turns ratio” in an ignition coil is to:

a) Increase the current in the secondary circuit

b) Maintain equal voltage across the primary and secondary windings

c) Step up the voltage from the primary to the secondary circuit

d) Ensure the primary coil remains at a lower resistance

10. What is a primary function of electromagnetic interference (EMI) suppression devices in automotive applications?

a) To increase signal strength in electronic circuits

b) To prevent radio-frequency interference from ignition systems

c) To increase the voltage in high-current circuits

d) To reduce mechanical wear on electrical components

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Answer Key Quiz B

Correct Answers:

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