Automotive Electrical and Engine Performance 9th Edition
Chapter 2 – Electrical Fundamentals
Multiple Choice Questions Quiz B

1. What is the primary function of the valence ring in an atom?

a) It dictates the element’s atomic number.

b) It controls the magnetic field around the atom.

c) It determines the element's capacity to combine with other atoms.

d) It balances the protons and neutrons in the nucleus.

2. Technician A states that free electrons allow for electrical conductivity in metals. Technician B says bound electrons are responsible for the flow of current. Who is correct?

a) Technician A only

b) Technician B only

c) Both Technicians A and B

d) Neither Technician A nor B

3. Which of the following best describes an insulator?

a) A material with fewer than two electrons in the outer orbit

b) A material with a fully occupied valence ring, typically five to eight electrons

c) A material that allows free flow of electrons under low voltage

d) A material that repels magnetic fields

4. The Peltier effect is used in automotive applications primarily to:

a) Measure engine temperature

b) Detect spark plug wear

c) Create a cooling or heating effect based on current direction

d) Improve battery voltage consistency

5. The number of protons and electrons in a neutral atom are:

a) Different to create a stable charge

b) The same, balancing positive and negative charges

c) Balanced only under specific conditions

d) Independent of each other

6. When a conductor's diameter is increased, what effect does this have on its resistance?

a) The resistance decreases

b) The resistance increases proportionally

c) The resistance remains constant

d) The resistance is unaffected by diameter changes

7. Which of the following materials would likely be classified as a semiconductor?

a) Copper

b) Carbon

c) Nylon

d) Aluminum

8. In which scenario would thermoelectricity be most effectively utilized?

a) In measuring voltage fluctuations in battery circuits

b) In fuel efficiency diagnostics

c) In temperature sensors that use heat to generate current

d) In controlling alternator output voltage

9. Technician A states that static electricity can only be generated by rubbing insulating materials. Technician B states that static electricity can be created in conductors as well. Who is correct?

a) Technician A only

b) Technician B only

c) Both Technicians A and B

d) Neither Technician A nor B

10. Which type of resistor is commonly used in throttle position sensors for variable voltage output?

a) Rheostat

b) Fixed resistor

c) Carbon resistor

d) Potentiometer

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Answer Key Quiz B

Correct Answers:

1. c

2. a

3. b

4. c

5. b

6. a

7. b

8. c

9. b

10. d