

Automotive Electrical and Engine Performance 9th Edition
Chapter 10 – Electronic Fundamentals
Multiple Choice Questions Quiz A

1. Which material is typically doped into silicon to create P-type semiconductor material?
 - a) Arsenic
 - b) Boron
 - c) Phosphorus
 - d) Indium

2. In a diode, what is the purpose of the depletion region?
 - a) It allows electrons to move freely between P-type and N-type materials.
 - b) It blocks current flow when the diode is reverse-biased.
 - c) It accelerates current flow in the forward-bias direction.
 - d) It stabilizes the voltage drop across the diode.

3. Which of the following defines the forward-bias condition in a diode?
 - a) Positive voltage applied to the N-type material
 - b) Positive voltage applied to the P-type material
 - c) A battery connected to both ends of the diode
 - d) The cathode connected to a higher voltage than the anode

4. Technician A states that a Zener diode can conduct in reverse when the breakdown voltage is reached. Technician B says a Zener diode only conducts in the forward-bias condition. Who is correct?
 - a) Technician A only
 - b) Technician B only
 - c) Both Technicians A and B
 - d) Neither Technician A nor B

5. Which of the following accurately describes the function of a clamping diode?
- a) It reduces the forward-bias voltage drop in an alternator.
 - b) It protects circuits by dissipating high-voltage spikes.
 - c) It amplifies voltage spikes for power regulation.
 - d) It increases current flow in the forward-bias direction.
6. When a light-emitting diode (LED) is forward-biased, it emits energy in the form of:
- a) Heat only
 - b) Light and heat
 - c) Magnetic flux
 - d) Electric field
7. How does a despiking resistor differ from a despiking diode in automotive circuits?
- a) It absorbs current surges, whereas a despiking diode limits voltage.
 - b) It provides voltage regulation, unlike a despiking diode.
 - c) It can dissipate excess current if the coil becomes shorted.
 - d) It allows high-frequency AC signals through but blocks DC.
8. Which type of diode is most suitable for voltage regulation in automotive electronics?
- a) Clamping diode
 - b) Zener diode
 - c) Light-emitting diode (LED)
 - d) Photodiode
9. What is the typical forward voltage drop across a silicon diode?
- a) 1.2 volts
 - b) 0.3 volts
 - c) 0.5 to 0.7 volts
 - d) 0.9 volts

10. In testing a diode with a digital multimeter, an “OL” reading in one direction and a 0.5-0.7V reading in the opposite direction indicates:

- a) The diode is shorted and needs replacement
- b) The diode is functioning normally
- c) The diode is open and must be replaced
- d) The diode has an internal resistance issue

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Answer Key Quiz A

Correct Answers:

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