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

1. What is the primary purpose of doping in semiconductors?

a) To create holes or free electrons that enable electrical conduction

b) To increase the physical strength of the semiconductor material

c) To reduce the temperature sensitivity of semiconductors

d) To convert N-type materials into P-type materials

2. In a P-N junction diode, current flow occurs when:

a) The anode is connected to the negative terminal of a power source

b) The cathode is connected to the positive terminal of a power source

c) The anode is more positive than the cathode, establishing forward bias

d) There is no bias applied to the junction

3. Which feature makes Zener diodes ideal for voltage regulation?

a) They conduct only in the forward-biased direction

b) They maintain a consistent voltage across a wide range of reverse currents

c) Their resistance increases with increasing voltage

d) Their ability to switch polarity without damage

4. What is the function of a despiking diode in automotive systems?

a) To amplify voltage spikes caused by the alternator

b) To adjust current flow in reverse-bias conditions

c) To regulate fuel flow in injection systems

d) To prevent high-voltage spikes from damaging sensitive electronics

5. What distinguishes an NPN transistor from a PNP transistor?

a) NPN transistors allow current to flow from emitter to collector when the base is positive

b) PNP transistors operate only in AC circuits

c) NPN transistors do not require doping of materials

d) PNP transistors use an external gate to control current flow

6. What is the primary role of a rectifier bridge in automotive alternators?

a) To convert AC generated by the alternator into DC for the vehicle's electrical system

b) To step down high voltages to usable levels

c) To store excess electrical energy for later use

d) To regulate engine RPM based on electrical load

7. In testing a silicon diode using a digital multimeter, a forward voltage drop of 0.5 to 0.7 volts indicates:

a) A faulty diode that needs replacement

b) An open diode circuit

c) A good diode in normal operating condition

d) Reverse bias failure

8. What is the significance of the dielectric constant in capacitors?

a) It determines the maximum voltage a capacitor can withstand

b) It measures the insulating strength of the capacitor material

c) It indicates the resistance of the capacitor to heat

d) It defines the capacitance-to-weight ratio

9. A phototransistor differs from a standard transistor in that:

a) It operates only in a forward-bias configuration

b) It cannot amplify electrical signals

c) It requires additional doping for proper operation

d) It uses light energy instead of voltage to control current flow

10. In an inverter circuit, MOSFETs are commonly used because:

a) They are cheaper than bipolar transistors

b) They require less current and are highly efficient

c) They operate only at very high voltages

d) They convert AC into DC power

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Answer Key Quiz B

Correct Answers:

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