



Class 12 Physics | Semiconductor Electronics

MCQ WORKSHEET • 15 questions • Choose one correct option • Suggested time: 25 minutes

1. A semiconductor has an energy gap typically:

- A. Exactly zero always
- B. Infinite
- C. Smaller than that of an insulator
- D. Larger than that of every insulator

2. In an intrinsic semiconductor, electron and hole concentrations are:

- A. Always zero
- B. Unequal by a factor of two
- C. Independent of temperature
- D. Equal

3. When temperature rises, intrinsic semiconductor conductivity generally:

- A. Becomes zero
- B. Increases
- C. Decreases like a metal
- D. Remains exactly constant

4. Doping silicon with a pentavalent impurity produces:

- A. An insulator necessarily
- B. p-type material
- C. A pure metal
- D. n-type material

5. Doping silicon with a trivalent impurity produces:

- A. An intrinsic semiconductor
- B. A superconductor
- C. n-type material
- D. p-type material

6. Majority carriers in n-type semiconductor are:

- A. Protons
- B. Electrons
- C. Neutrons
- D. Holes

7. Majority carriers in p-type semiconductor are:

- A. Holes
- B. Electrons
- C. Neutrons
- D. Positive impurity ions moving freely

8. An n-type semiconductor is electrically:

- A. Negatively charged overall always
- B. Positively charged overall always
- C. Neutral overall
- D. Unable to conduct

9. Near a p-n junction, the depletion region has:

- A. No fixed ions
- B. Very few mobile charge carriers
- C. Only freely moving electrons
- D. Only freely moving holes

10. The built-in electric field in a depletion region points from:

- A. n-side to p-side
- B. Nowhere; it is always zero
- C. Parallel to the junction
- D. p-side to n-side

11. A junction is forward biased when:

- A. No battery is present
- B. Both sides connect to positive terminal
- C. p-side connects to negative and n-side to positive terminal
- D. p-side connects to positive and n-side to negative terminal

12. Forward bias makes depletion width:

- A. Unchanged always
- B. Smaller
- C. Larger
- D. Infinite

13. Reverse bias makes depletion width:

- A. Negative
- B. Larger
- C. Zero
- D. Smaller

14. A diode used as a rectifier chiefly:

- A. Stores magnetic energy
- B. Allows current mainly in one direction
- C. Increases AC frequency necessarily
- D. Provides resistance independent of voltage

15. An ideal half-wave rectifier driven at 50 Hz produces output pulses at:

- A. 100 Hz
- B. 25 Hz
- C. 0 Hz
- D. 50 Hz

ANSWER KEY — check after completing all 15 questions

1.C 2.D 3.B 4.D 5.D 6.B 7.A 8.C 9.B 10.A 11.D 12.B 13.B 14.B 15.D

Original exam-style practice • Reference notes: www.physics.guru/cbse-practice-papers/ • Not an official paper