

Semiconductor Electronics: Materials, Devices and Simple Circuits

1. Region without free electrons and holes in a p-n junction is

- (a) n-region
- (b) p-region
- (c) depletion region
- (d) none of these

▼ **Answer**

Answer: c

2. Which of the following statements is incorrect for the depletion region of a diode?

- (a) There the mobile charges exist.
- (b) Equal number of holes and electrons exist, making the region neutral.
- (c) Recombination of holes and electrons has taken place.
- (d) None of these

▼ **Answer**

Answer: a

3. Potential barrier developed in a junction diode opposes the flow of

- (a) minority carrier in both regions only
- (b) majority carriers only
- (c) electrons in p region
- (d) holes in p region

▼ Answer

Answer: b

4. The breakdown in a reverse biased p-n junction diode is more likely to occur due to

- (a) large velocity of the minority charge carriers if the doping concentration is small
- (b) large velocity of the minority charge carriers if the doping concentration is large
- (c) strong electric field in a depletion region if the doping concentration is small
- (d) none of these

▼ Answer

Answer: b

5. What happens during regulation action of a Zener diode?

- (a) The current through the series resistance (R_s) changes.
- (b) The resistance offered by the Zener changes.
- (c) The Zener resistance is constant.
- (d) Both (a) and (b)

▼ Answer

Answer: d

6. A zener diode is specified as having a breakdown voltage of 9.1 V, with a maximum power dissipation of 364 mW. What is the maximum current the diode can handle?

- (a) 40 mA
- (b) 60 mA
- (c) 50 mA
- (d) 45 mA

▼ Answer

Answer: a

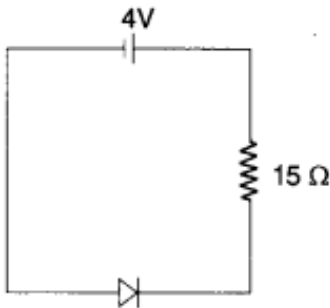
7. In a half wave rectifier circuit operating from 50 Hz mains frequency, the fundamental frequency in the ripple would be

- (a) 25 Hz
- (b) 50 Hz
- (c) 70.7 Hz
- (d) 100 Hz

▼ Answer

Answer: b

8. In the circuit shown if current for the diode is $20\ \mu\text{A}$, the potential difference across the diode is



- (a) 2 V
- (b) 4.5 V
- (c) 4 V
- (d) 2.5 V

▼ Answer

Answer: c

9. Carbon, silicon and germanium have four valence electrons each. These are characterised by valence and conduction bands separated by energy band gap respectively equal to $(E_g)_C$, $(E_g)_{Si}$ and $(E_g)_{Ge}$. Which of the following statements is true?

- (a) $(E_g)_{Si} < (E_g)_{Ge} < (E_g)_C$
- (b) $(E_g)_C < (E_g)_{Ge} < (E_g)_{Si}$
- (c) $(E_g)_C < (E_g)_{Si} < (E_g)_{Ge}$
- (d) $(E_g)_C = (E_g)_{Si} < (E_g)_{Ge}$

▼ Answer

Answer: c

10. If the energy of a photon of sodium light ($\lambda = 589 \text{ nm}$) equals the band gap of semiconductor, the minimum energy required to create hole electron pair

- (a) 1.1 eV
- (b) 2.1 eV
- (c) 3.2 eV
- (d) 1.5 eV

▼ Answer

Answer: b

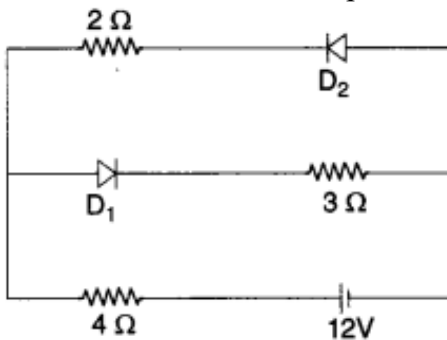
11. If in a n-type semiconductor when all donor states are filled, then the net charge density in the donor states becomes

- (a) 1
- (b) > 1
- (c) < 1 , but not zero
- (d) zero

▼ Answer

Answer: b

Physics MCQs for Class 11 with Answers Pdf Question 12. The circuit has two oppositely connected ideal diodes in parallel. What is the current flowing in the circuit?



- (a) 2.0 A
- (b) 1.33 A
- (c) 1.73 A
- (d) 2.31 A

▼ Answer

Answer: c

13. At absolute zero, Si acts as a

- (a) metal
- (b) semiconductor

- (c) insulator
- (d) none of these

▼ Answer

Answer: c

14. In good conductors of electricity the type of bonding that exist is

- (a) Van der Waals
- (b) covalent
- (c) ionic
- (d) metallic

▼ Answer

Answer: d

15. The manifestation of band structure in solids is due to

- (a) Heisenberg uncertainty principle
- (b) Pauli's exclusion principle
- (c) Bohr's correspondence principle
- (d) Boltzmann law

▼ Answer

Answer: b

16. The probability of electrons to be found in the conduction band of an intrinsic semiconductor of finite temperature

- (a) increases exponentially with increasing band gap
- (b) decreases exponentially with increasing band gap
- (c) decreases with increasing temperature.
- (d) is independent of the temperature and band gap

▼ Answer

Answer: b

17. In an n-type silicon, which of the following statements is true.

- (a) Electrons are majority carriers and trivalent atoms are the dopants
- (b) Electrons are minority carriers and pentavalent atoms are the dopants.
- (c) Holes are minority carriers and pentavalent atoms are the dopants.
- (d) Holes are majority carriers and trivalent atoms are the dopants.

▼ Answer

Answer: c

18. If a small amount of antimony is added to germanium crystal

- (a) its resistance is increased
- (b) it becomes a p-type semiconductor
- (c) there will be more free electrons than holes in the semiconductor,
- (d) none of these.

▼ Answer

Answer: c

Semiconductor Electronics Question 19. The dominant mechanism for motion of charge carriers in forward and reverse biased silicon p-n junction are

- (a) drift in forward bias, diffusion in reverse bias
- (b) diffusion in forward bias, drift in reverse bias
- (c) diffusion in both forward and reverse bias
- (d) drift in both forward and reverse bias

▼ Answer

Answer: b

20. In an unbiased p-n junction, holes diffuse from the p-region to n-region because

- (a) free electrons in the n-region attract them
- (b) they move across the junction by the potential difference
- (c) hole concentration in p-region is more as compared to u-region.
- (d) all of these

▼ Answer

Answer: c
