

SEMICONDUCTOR.

1. On doping germanium metal, with a little amount of indium, what does one get?

- a) Intrinsic semiconductor
- b) Insulator
- c) n-type semiconductor
- d) p-type semiconductor

2. In a pure semiconductor crystal, if current flows due to breakage of crystal bonds, then what is the semiconductor called?

- a) Acceptor
- b) Donor
- c) Intrinsic semiconductor
- d) Extrinsic semiconductor

3. Which of the following, when added as an impurity, into the silicon, produces n-type semiconductor?

- a) Phosphorous
- b) Aluminum
- c) Magnesium
- d) Sulfur

4. In n-type semiconductors, which one is the majority charge carriers?

- a) Holes
- b) Protons
- c) Neutrons
- d) Electrons

5. A small impurity is added to germanium to get a p-type semiconductor. Identify the impurity?

- a) Bivalent substance
- b) Trivalent substance
- c) Pentavalent substance
- d) Monovalent substance

6. Boron when added as an impurity, into the silicon, produces n-type semiconductor.

- a) True
- b) False

7. Identify the property which is not characteristic for a semiconductor?

- a) At a very low temperature, it behaves like an insulator

- b) At higher temperatures, two types of charge carriers will cause conductivity
- c) The charge carriers are electrons and holes in the valence band at higher temperatures
- d) The semiconductor is electrically neutral

8. The n-type semiconductor is which of the following?

- a) Positively charged
- b) Negatively charged
- c) Neutral
- d) Positive or negative depending upon doping materials

9. The dominant contribution to current comes from holes in case of which of the following?

- a) Metals
- b) Intrinsic semiconductors
- c) p-type extrinsic semiconductors
- d) n-type extrinsic semiconductors

10. In a p-type semiconductor, germanium is doped with which of the following?

- a) Gallium
- b) Copper
- c) Phosphorous
- d) Nitrogen

11. The manifestation of the band structure in solids is due to which of the following?

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

12. The energy band gap is maximum in which of the following?

- a) Metals
- b) Superconductors
- c) Insulators
- d) Semiconductors

13. At absolute zero, Si acts as which of the following?

- a) Non-metal
- b) Metal
- c) Insulator
- d) Superconductor

14. A piece of copper and another of germanium are cooled from room temperature to 77 K. what will impact on the resistance of each of them?
- a) Each of these decreases
 - b) Copper strip increases and that of germanium decreases
 - c) Copper strip decreases and that of germanium increases
 - d) Each of these increases
15. In semiconductors at room temperature, which of the following is likely to happen?
- a) The valence band is partially empty and the conduction band is partially filled
 - b) The valence band is filled and the conduction band is partially filled
 - c) The valence band is filled
 - d) The conduction band is empty
16. At absolute zero temperature, a semiconductor acts as a conductor.
- a) True
 - b) False
17. Which of the following is true regarding insulators?
- a) The valence band is partially filled with electrons
 - b) The conduction band is partially filled with electrons
 - c) The conduction band is filled with electrons and valence band empty
 - d) The conduction band is empty and valence band is filled with electrons
18. Crystalline solids are which of the following?
- a) Anisotropic
 - b) Isotropic
 - c) Amorphous
 - d) Unipotential
19. Which of the following is an amorphous solid?
- a) Glass
 - b) Diamond
 - c) Salt
 - d) Sugar
20. At which temperature, a pure semiconductor behaves slightly as a conductor?
- a) Low temperature
 - b) Room temperature
 - c) High temperature
 - d) Supercritical temperature

ANSWERS-1.(D) 2.(C) 3.(A) 4.(D) 5.(B) 6.(B) 7.(C) 8.(C) 9.(C) 10.(A) 11.(B) 12.(C) 13.(C) 14.(C) 15.(A) 16.(B) 17.(D) 18.(A) 19.(A) 20.(C)