SREE VIDYANIKETHAN
International School

Sree Sainath Nagar,Tirupati – 517102

Holiday Package

Class: XII **Subject: Physics**

1. In an n-type silicon, which of the following statement 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.
2. Which of the statements given in Exercise 14.1 is true for p-type semiconductors?
3. Carbon, silicon and germanium have four valence electrons each. These are characterized by valence and condition bands separated by energy band gap respectively equal to $(E_g)_C$, $(E_g)S_1$ and $(E_g)_{Ge}$. Which of the following statements is true?
   (a) $(E_g)_{S1} < (E_g)_{Ge} < (E_g)_C$
   (b) $(E_g)_C < (E_g)_{Ge} > (E_g)_{S1}$
   (c) $(E_g)_C > (E_g)_{S1} > (E_g)_{Ge}$
   (d) $(E_g)_C = (E_g)_{S1} = (E_g)_{Ge}$
4. 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 n-region.
   (d) All the above
5. When a forward bias is applied to a p-n junction, it
   (a) Raises the potential barrier.
   (b) Reduces the majority carrier current to zero.
   (c) Lowers the potential barrier.
   (d) None of the above.
6. For transistor action, which of the following statements are correct:
   (a) Base, emitter and collector regions should have similar size and doping concentrations.
   (b) The base region must be very thin and lightly doped.
   (c) The emitter junction is forward biased and collector junction is reverse biased.
   (d) Both the emitter junction as well as the collector junction are forward biased.
7. For a transistor amplifier, the voltage gain
   (a) remains constant for all frequencies.
   (b) is high at high and low frequencies and constant in the middle frequency range.
   (c) is low at high and low frequencies and constant at mid frequencies.
   (d) None of the above.
8. In half-wave rectification, what is the output frequency if the input frequency is 50 H_Z. What is the output frequency of a full-wave rectifier for the same input frequency.
9. For a CE-transistor amplifier, the audio signal voltage across the collected resistance of 2 kΩ is 2 V. suppose the current amplification factor of the transistor is 100, find the input signal voltage and base current, if the base resistance is 1Ω.
10. Two amplifiers are connected one after the other in series (cascaded). The first amplifier has a voltage gain of 10 and the second has a voltage gain of 20. If the input signal is 0.01 volt, calculate the output ac signal.