SHIKSHA CLASSES

BOARD QUESTION PAPER

Subject : Physics **Topic: 16. Semiconductor Devices** **Total Marks : 20**
Class : XII **Time : 1 Hr.**

Section (A)

Q. 1. : Select and write the most appropriate answer from given alternatives in each sub-question **5**

i) Hole is

a) An antiparticle of an electron

b) Absence of free electrons

c) An artificially created particle

d) A vacancy created when an electron leaves a covalent bond.

ii). At O^0K, intrinsic semiconductor behaves as

a) A superconductor b) A perfect insulator

c) A semiconductor d) A perfect conductor.

iii) In a semiconducting material the mobilities of electron and holes are μ_e and μ_h respectively. Which of the following is true?

a) $\mu_e > \mu_h$ b) $\mu_e < \mu_h$ c) $\mu_e = \mu_h$ d) $\mu_e < 0,\ \mu_h > 0$

iv) The forbidden energy gap in the energy bands of germanium at room temperature is about

a) 1.1 eV b) 0.1 eV c) 0.67 eV d) 6.7 eV

v) When n-p-n transistor is used as an amplifier?

a) Electrons move from base to collector

b) Holes moves from emitter to base

c) Holes moves from collector to base

d) Electrons move from collector to base

Q. 2. : Very short answer type Question **2**

i) Give the logic symbol & Boolean expression of AND gate.

ii) Why is the base of transistor made thin and lightly doped?

Section (B)

: Attempt any three . **6**

Q. 3. : What is meant by Ripple factor? State its formula.

Q. 4 : Explain the working of photo cell.

Q. 5 : Define : (i) Intrinsic semiconductor (ii) Extrinsic semiconductor.

Q. 6. : State any four advantages of solar cell.

Section (C)

: Attempt any one . **3**

Q. 7 .: Explain the working of a transistor as a switch.

Q. 8. : Explain the construction and working of full wave rectifier.

Section (D)

: Attempt any one . **4**

Q. 9. : i) Write the Boolean expression for i) OR gate ii) AND gate iii) NAND gate.

ii) Why is a NOT gate known as an inverter?

Q. 10. : i) State any four uses of LEDs. Explain the working of transistor.

ii) Draw a neat labelled circuit diagram to study the characteristics of transistor in common emitter configuration.

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