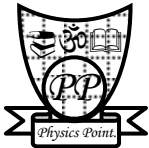


# PHYSICS POINT

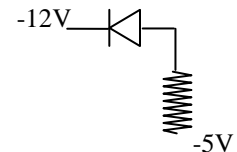
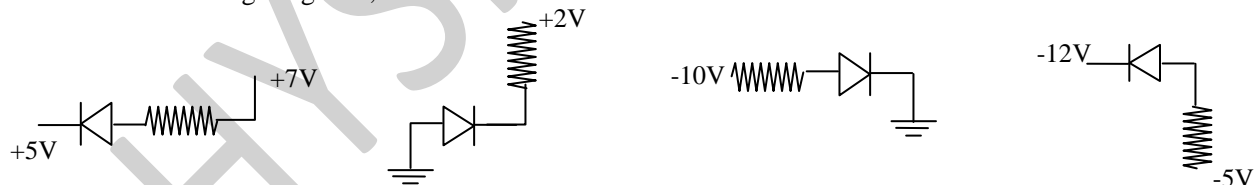
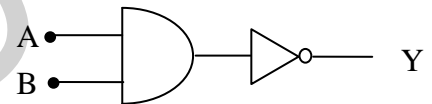


**FOR – XIth , XIIth & Competitive Exam.**

*Work Sheet—[Semiconductor].*

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1. What types of charge-carriers are there in a n-type semi conductor?
2. Give the logical symbol of an AND gate. Mark the inputs and outputs.
3. Which biasing will make the resistance of p-n junction high?
4. What is the change in the collector current, in a transistor of a.c. current gain 150, for a  $100\mu\text{A}$  change in its base current?
5. Write the truth table for the combination of gates shown here.
6. When the voltage drop across a p-n junction diode is increased from  $0.65\text{V}$  to  $0.70\text{V}$ , the change in the diode current is  $5\text{mA}$ . What is the dynamic resistance of the diode?
7. How does conductivity of a semiconductor change with rise in its temperature? Explain.
8. How does the collector current change in a junction transistor, if the base region has larger width? Explain.
9. How does the thickness of the depletion layer in a p-n junction vary with increase in reverse bias? Explain.
10. How does the energy gap in an intrinsic semiconductor vary, when doped with a pentavalent impurity? Explain.
11. Draw a circuit for p-n junction diode in forward bias. Sketch the voltage versus current graph for the same.
12. In the following diagrams, indicate which of the diodes are forward biased and which are reversed biased.



13. What is a p-n junction? Explain with the help of a diagram, how depletion layer is formed near the junction. Explain also what happens to this layer when the junction is (i) forward biased and (ii) reverse biased.
14. A semiconductor has equal electron and hole concentrations of  $2 \times 10^8/\text{m}^3$ . On doping with a certain impurity, the hole concentration increases to  $4 \times 10^{10}/\text{m}^3$ . (i) What type of semiconductor is obtained on doping? (ii) Calculate the new electron hole concentration of the semiconductor. (iii) How does the energy gap vary with doping?
15. Draw the circuit diagram to show the use of a transistor as an oscillator. State how the positive feedback is provided in the circuit.
16. By drawing a labeled circuit diagram, explain how a NPN transistor can be used as an amplifier in common base configuration. Find its current gain, voltage gain and power gain.
17. Define the terms “potential barrier” and ‘depletion region’ for a p-n junction. Explain with the help of a circuit diagram, the use of a pn junction as a full wave rectifier. Draw the input and output waveforms.

*PHYSICS POINT is a unit of GURUKUL ACADEMY*

*Work sheet based on C. B. S. E Exam 2013; Prepared By - A.K. Pandey Contact no - 9958655311*