# Tutorial1

## Electronic Devices and Circuits

## Chapter 1

1. What is junction Breakdown? Compare Zener breakdown with avlanche breakdown.
2. What is V-I characteristics of diode? Explain the effects of temperature in V-I characteristic curves.
3. Explain ideal and piecewise model of a diode.

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| 1. Draw V-I characteristics curve of pn junction diode Distinguish between a zener breakdown and avalanche breakdown. 2. Differentiate between intrinsic and extrinsic semiconductor. A silicon diode has saturation current of 5 nanoampere at room temperature. What is the saturation current at 100 degree centigrade. |
| 1. Calculate the current through load resistor and zener diode.      1. For the Zener diode network of the following figure Calculate   Vs=50V,Rs=1kohm,Vz=10V,RL=1K  Image result for zener diode numerical   1. Load Voltage 2. Current across Zener diode 3. Voltage across resistance Rs 4. Power across Zener diode 5. The circuit shown uses two Zener diodes each rated at 10V,180 mA. Determine      1. The value of series resistance 2. Maximum power dissipated across each Zener diode 3. Calculate the current through load resistor and Zener diode.      1. What do you mean by dynamic reisistance of a diode ? Derive an expression for dyna,ic resistance of a diode. 2. What happens when a forward biased diode is suddenly reverse biased? Explain with necessary diagram. 3. Differentiate between diffusion and transition capacitance. Derive an expression for transition capacitance. 4. Explain Zener diode as voltage regulator. 5. What do you mean by Intrinsic and Extrinsic Semicondutors? Why is an intrinsic semiconductor not adequate for making semiconductor devices? 6. Explain the operation of PN junction diode under: 7. no bias 8. forward bias and 9. reverse bias 10. How does a semiconductor differ from conductor and insulator? Explain with the help of energy band diagram. Energy band gap of some unknown materials are given as: 11. 15 eV 12. 0.7eV 13. Overlapping   Distinguish their respective class as a metal, semiconductor and insulator.   1. .Determine the range of values of Vin that will maintain the Zener diode in the “ON” state. Also find the maximum power that can be dissipated to the diode.   (Semiconductor Devices).  (Hint : Izm = ener current rating. Power = Izm \* Vz)     1. A Zener regulator has 9 volt Zener voltage with variable load resistance as shown:     Calculate:   * 1. Current through the series resistance   2. Maximum and minimum load current.   3. Maximum and minimum zener current   4. Maximum and minimum power dissipation in the zener diode.  1. A Zener with given specification is used for stabilized supply to a variable load as shown in figure below. Given Pmax=0.6w. Calculate: 2. Series resistance required 3. Diode current when RL =10k. |