

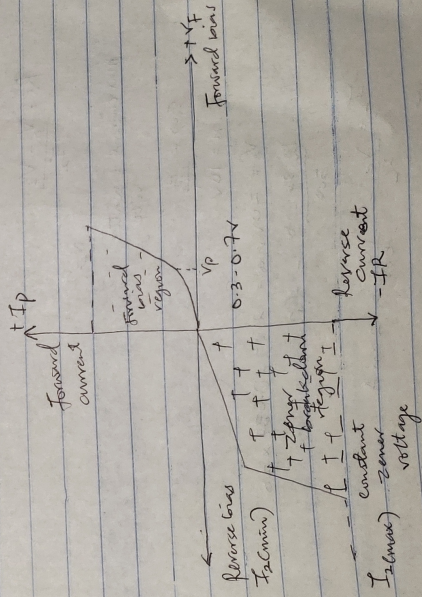
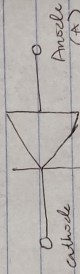
18/Eng 08/09

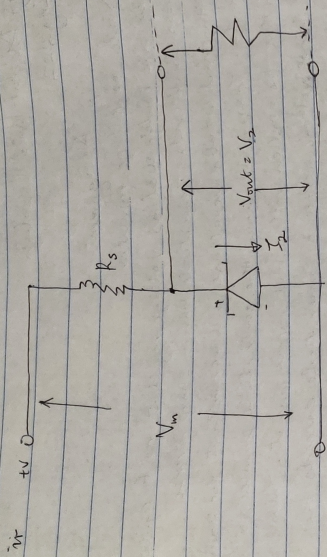
Raj Alkhalil Muneer Mubolaji
Eng 222

Assignment

1. Zener Diode as voltage regulator.

They are widely used as voltage regulators to regulate voltage across small loads. Zener diodes have a sharp reverse breakdown voltage and break-down voltage will be constant for wider range of currents. Thus we will connect the zener diode parallel to the load such that the applied voltage will reverse bias it. Thus if the reverse bias voltage across the zener diode exceeds the knee voltage, the voltage across the load will be constant.





Zener Diode Regulator Circuit

2. To determine the minimum value of the Zener resistor to the Zener diode

$$R_s = \frac{V_s - V_z}{I_z} \quad V_s = ?$$

Max current = watts / voltage

$$500 = \frac{5}{n}$$

$$n = 100$$

$$V_s = 20V_{max} = 12.74 = 0.637 \times 20$$

$$R_s = \frac{12.74 - 10}{500} \approx 4\Omega$$

$$I_L = \frac{V_z}{R_L} = \frac{10}{500} = 20mA$$

$$I_z = I_s - I_L = 50mA - 20mA = 30mA$$