

NAME: UMUNNAH CHINEDU

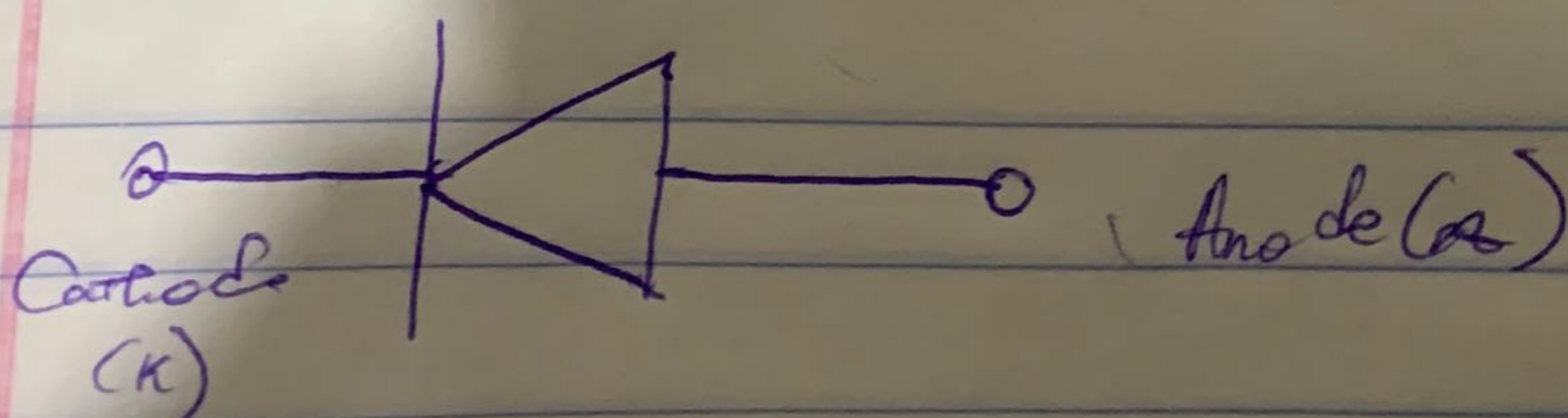
MAT NO: 18/ENG06/070

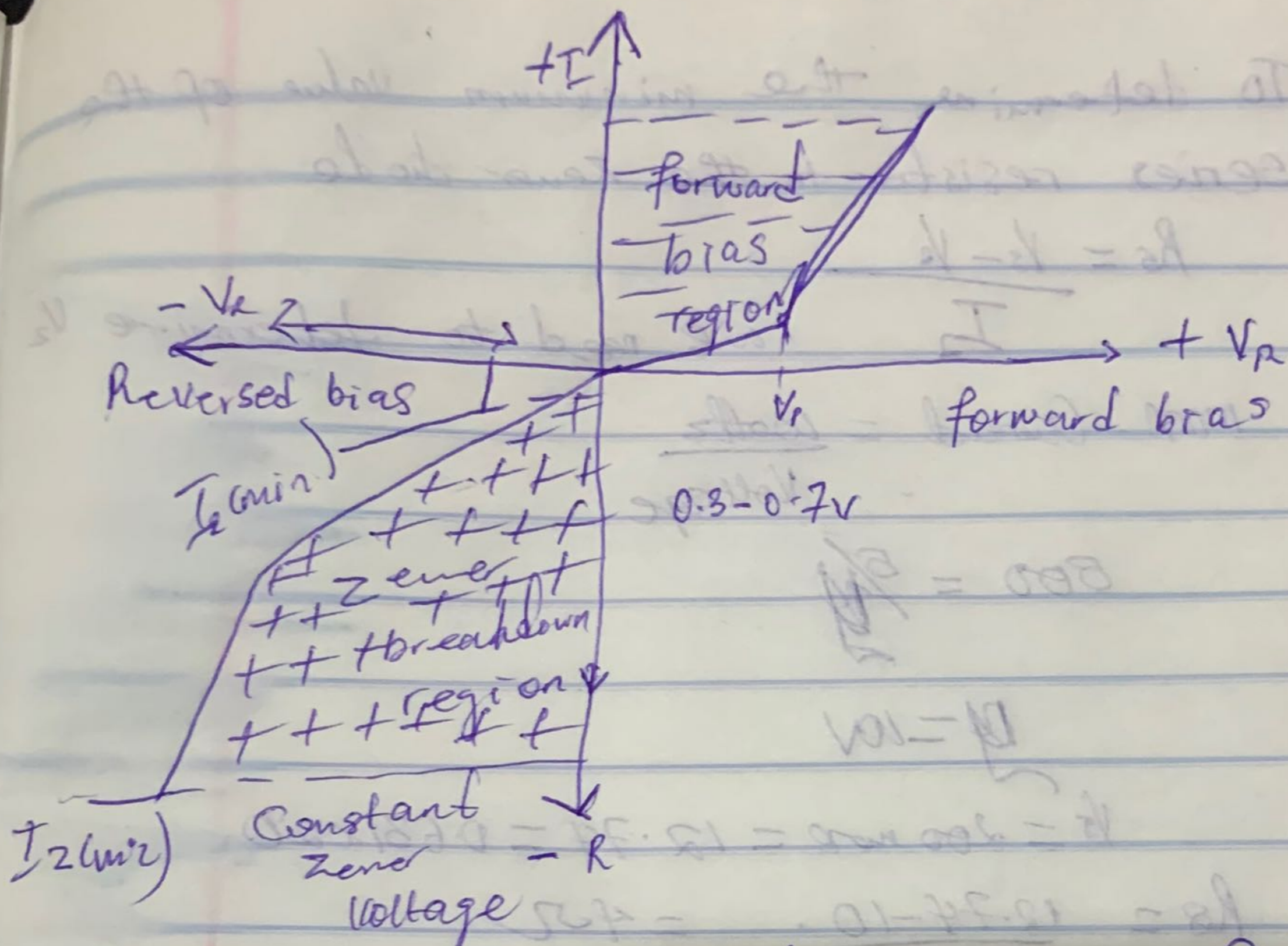
DEPARTMENT: 18/ENG06/070

COURSE: ENG222

i) Zener Diode voltage regulator: They are used as shunt voltage regulators to regulate voltage across small loads. Zener diodes have a sharp reverse breakdown voltage and will ~~be~~ with constant force and range of currents. Thus, if the reverse bias voltage across the zener diode exceeds the knee voltage across the load will be constant

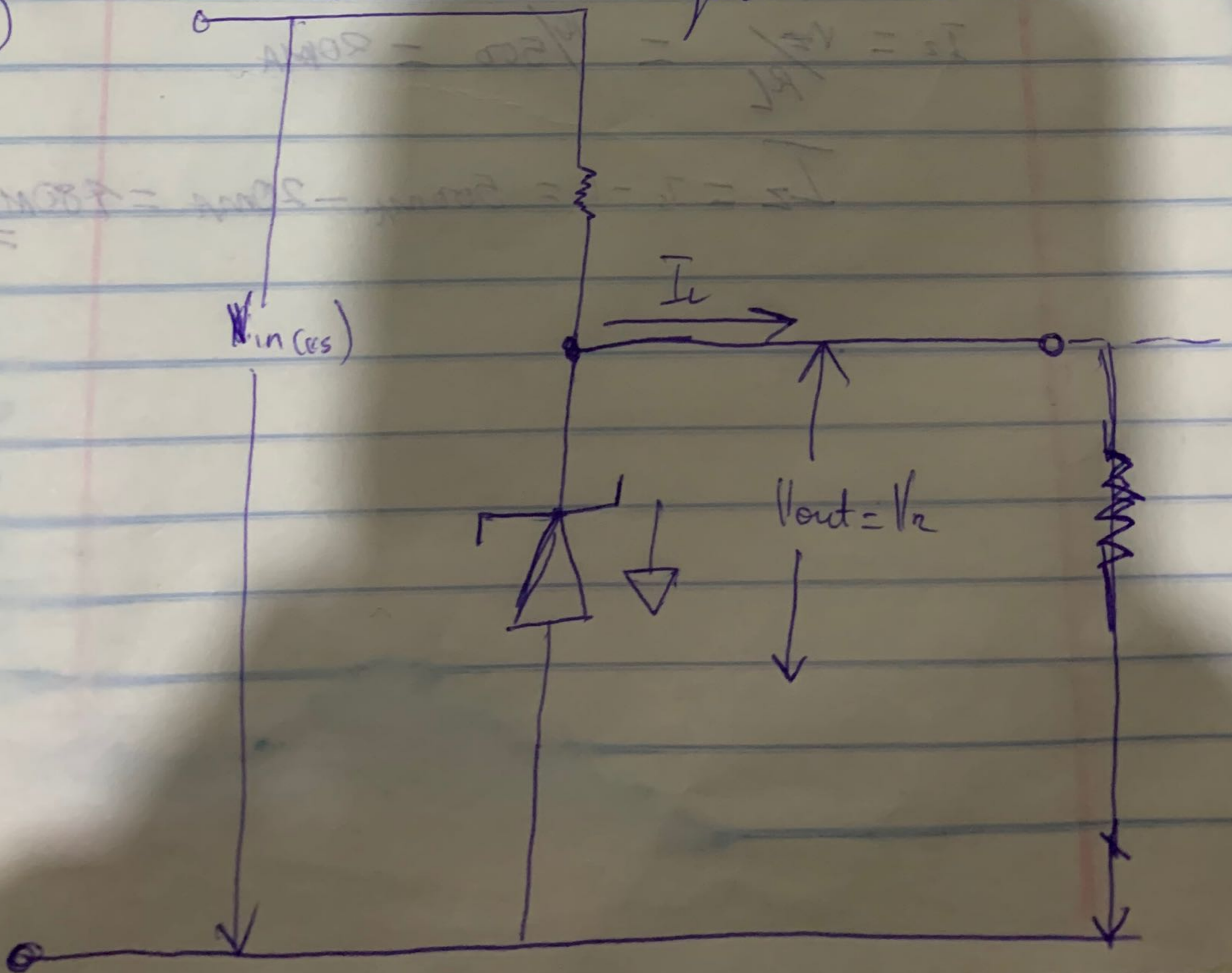
Symbol





### Zener diode Regulator Circuit

ii.)



2.) To determine the minimum value of the series resistor to the zener diode

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

we need to determine  $V_z$   
 max Current =  $\frac{\text{Wattz}}{\text{Voltage}}$

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

$$V_z = 10V$$

$$V_s = 200 \text{ mV} = 12.74 = 0.631 \times 20$$

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

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

$$I_z = I_s - I_L = 500 \text{ mA} - 20 \text{ mA} = 480 \text{ mA}$$

