

2. 18/ENG03/017

$$V_s = 20$$

$$V_z = ?$$

$$\text{max current} = 500 \text{ mA} = I_s$$

$$P_z = 5 \text{ W}$$

$$\textcircled{1} I_s = \frac{P_z}{V_z} = \frac{5}{500 \times 10^{-3}} = 10 \text{ V}$$

$$\therefore V_z = 10 \text{ V}$$

$$R_s = \frac{V_s - V_z}{I_z} = \frac{20 - 10}{500 \times 10^{-3}} = \frac{10}{500 \times 10^{-3}} = 20$$

$$R_s = 20 \Omega$$

$$\textcircled{ii} I_z = I_s - I_L \quad \therefore I_L = \frac{V_L}{R_L} = \frac{10}{500} = 0.02 \text{ A} = 20 \text{ mA}$$

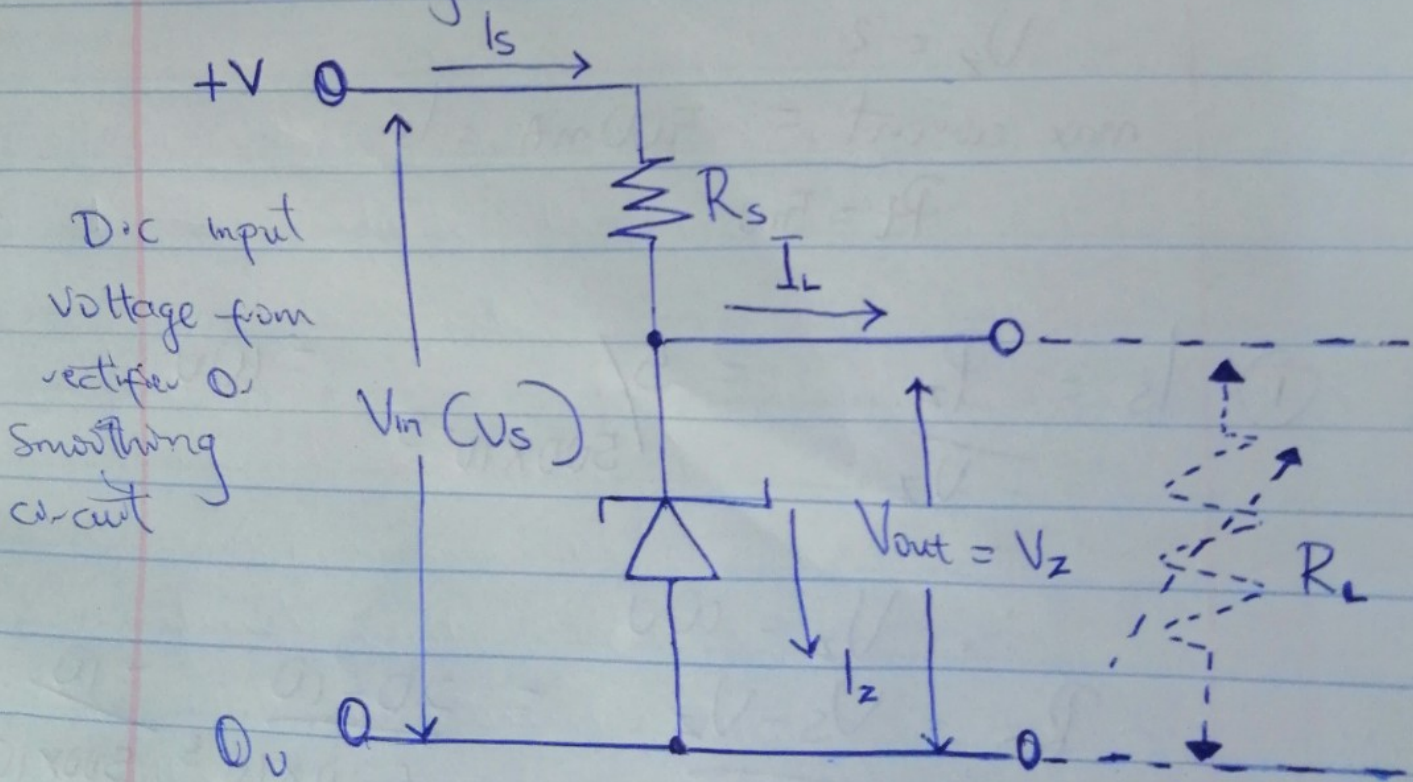
$$\therefore I_z = (500 - 20) \text{ mA}$$

$$= \underline{\underline{480 \text{ mA}}}$$

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Circuit diagram.



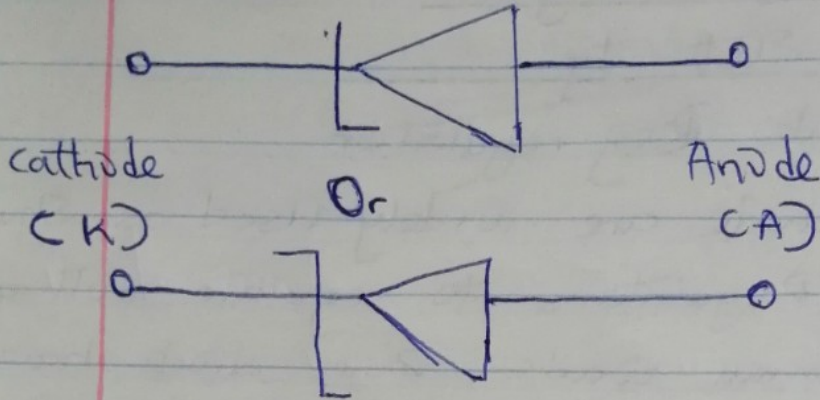
2..

$V_s = 20$ $V_z = ?$ max current 5

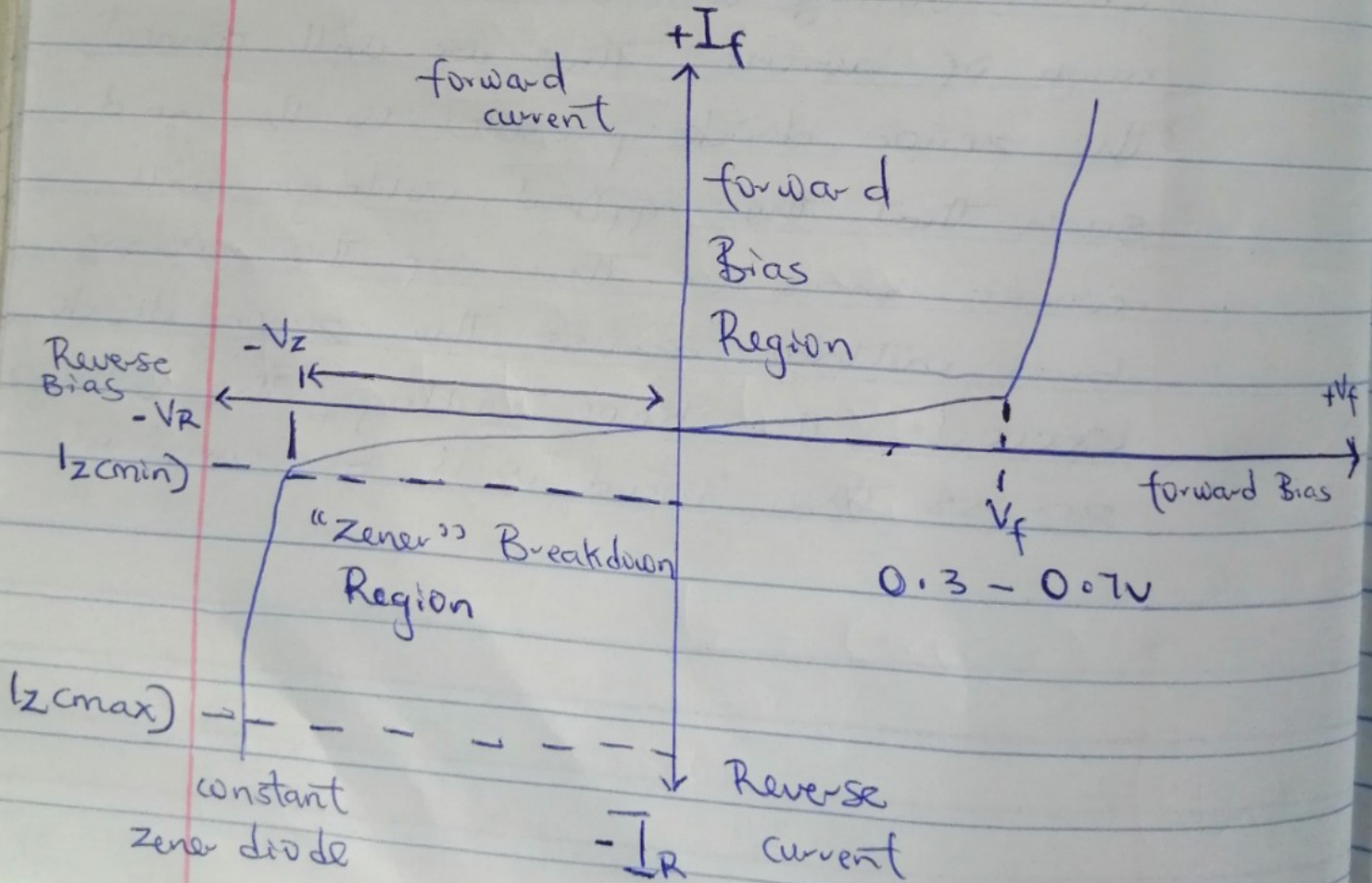
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Symbol and I-V characteristics curve



I-V characteristics curve



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18/ENG03017

Civil-Engineering-

Basic Electricity

1. Zener diode ~~Reg~~ regulator

Zener diode are widely used as shunt voltage regulators to regulate voltage across small loads. Zener diode have a sharp reverse breakdown voltage and breakdown voltage will be constant for a wide range of current. 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.