

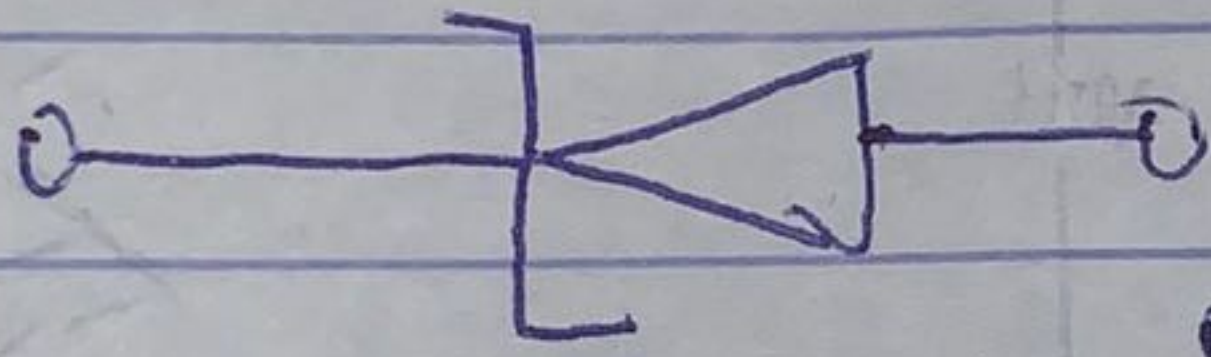
ERNEST-OTOL ROMEO

18/ENR071004

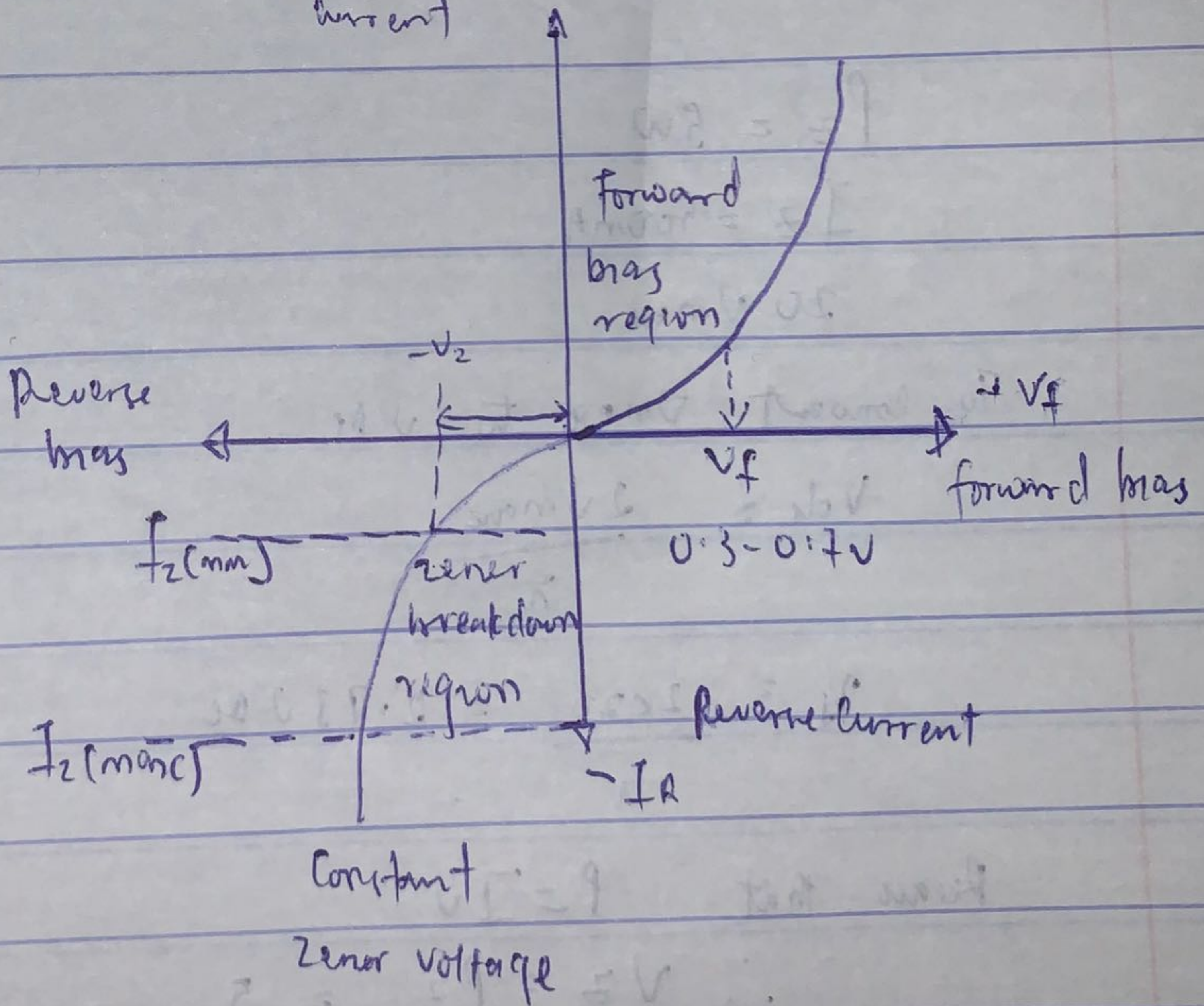
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i) A Zener diode is a diode similar to the standard, PN junction diode but they are specially designed to have a low and specified reverse breakdown voltage.

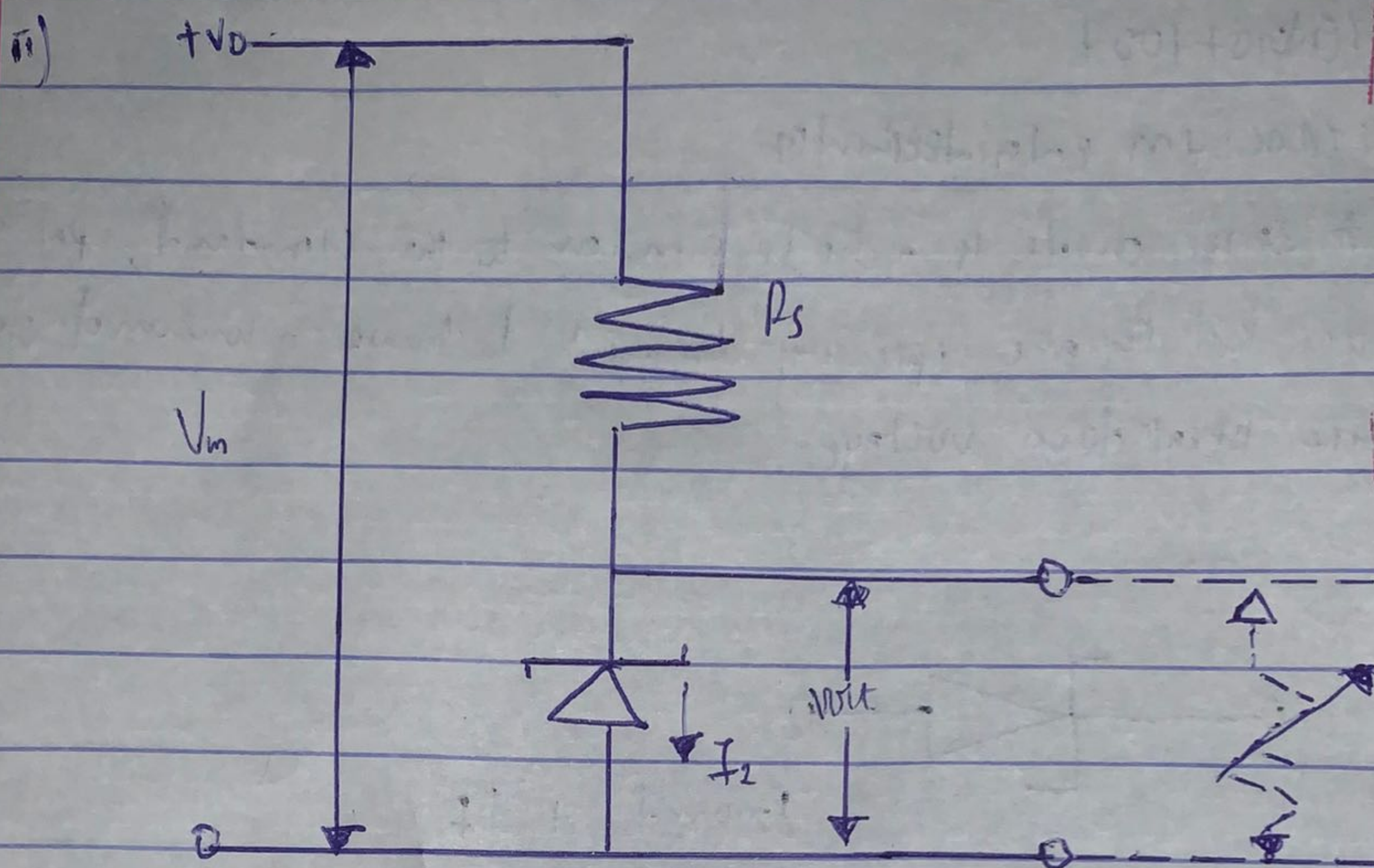
i)



forward + I_f
current



I-V characteristics curve



$$P_z = 5W$$

$$I_z = 500mA$$

$$20V_{max}$$

To convert V_{max} to V_{dc} ,

$$V_{dc} = \frac{2V_{max}}{\pi}$$

$$V_s = \frac{2 \times 20}{\pi} = 12.73V_{dc}$$

Because that $P = I V$

$$\therefore V_z = \frac{P_z}{I_z} = \frac{5}{500 \times 10^{-3}}$$

$$V_z = 10V$$

Because that $V_z + V_R = V_s$

$$V_R = V_S - V_Z$$

$$\frac{2 \times 20}{*} - 10$$

$$= 2.73 - 10 = 2.73 \text{ V}$$

$$\therefore V = 12$$

$$R = \frac{V}{I} = \frac{2.73}{500 \times 10^{-3}}$$

$$R = 5.46$$

Since its connected in series am

$$I_S = I_Z + I_L$$

$$I_Z = I_S - I_L$$

$$I_L = \frac{V_Z}{R}$$

$$= \frac{10 \text{ V}}{500 \Omega} = 0.02 \text{ A} = 20 \text{ mA}$$

$$I_Z = 500 \text{ mA} - 20 \text{ mA}$$

$$= 480 \text{ mA} = 0.48 \text{ A}$$