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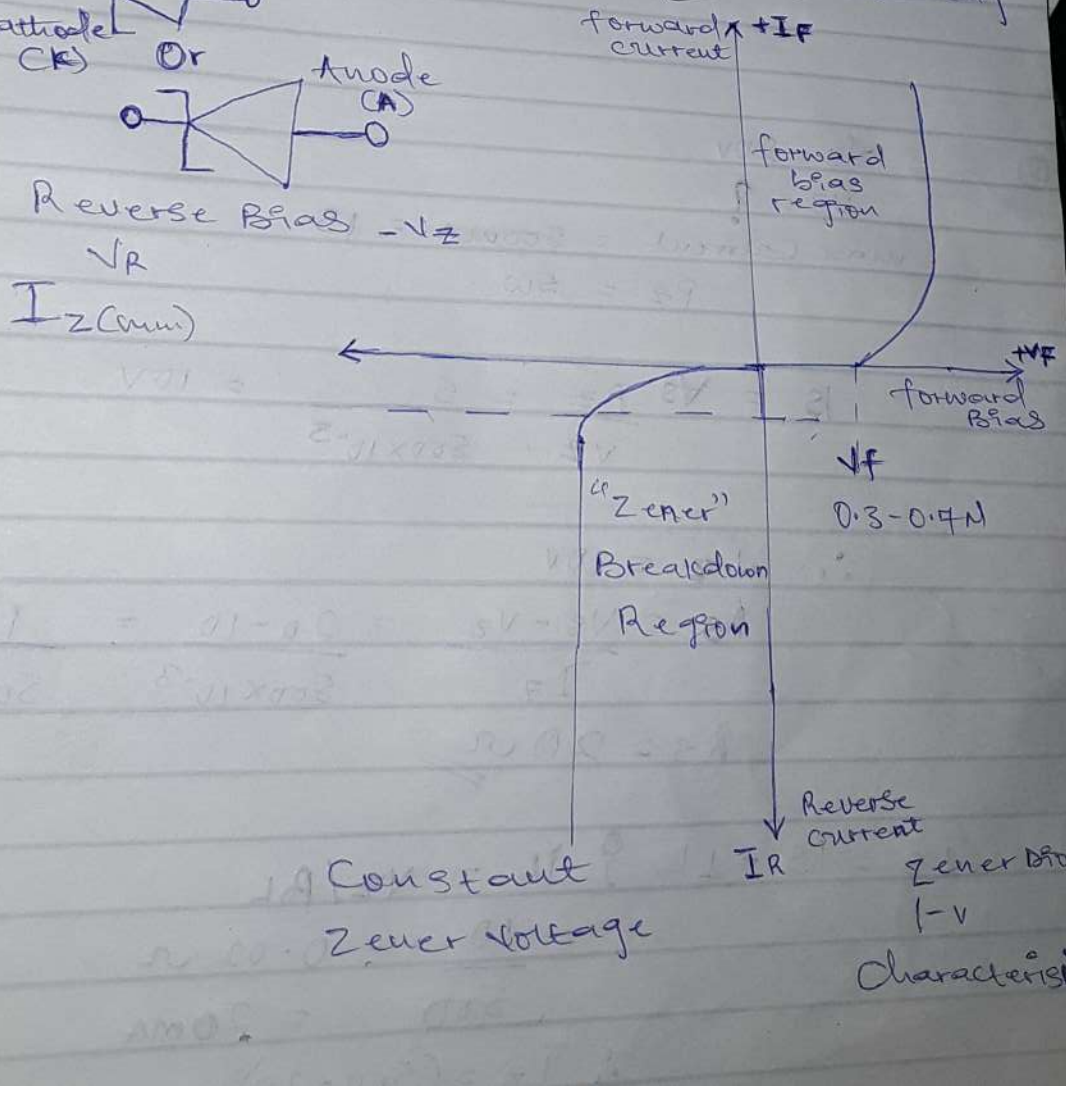
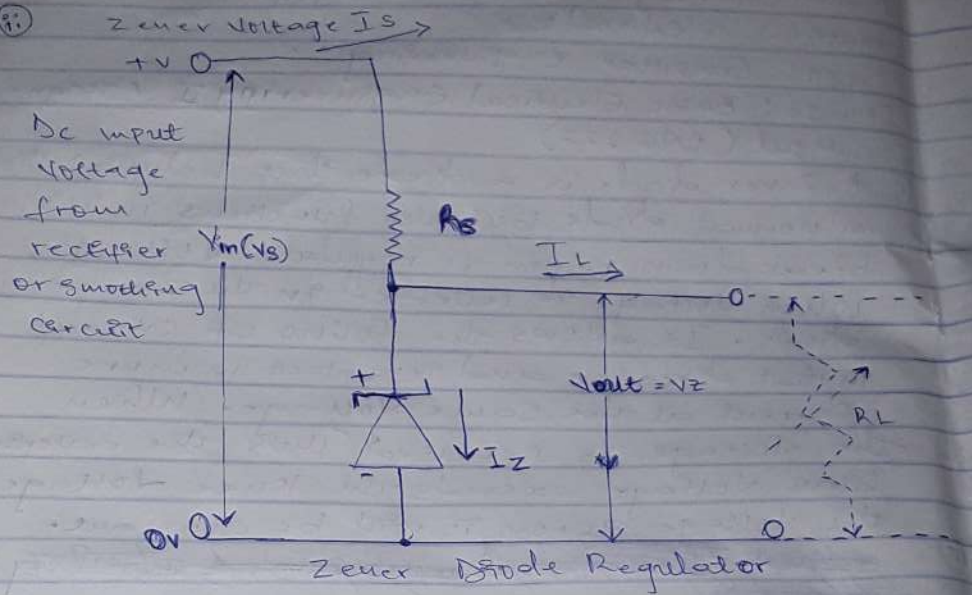
Matric: 18/ENG02/008
Dept: Computer Engineering
Course: Basic Electrical Engineering II Assignment (ENG 222)

① A zener diode is a diode that behaves like a normal diode but also functions in it's breakdown region to regulate voltage, when voltage is reversed in the zener diode. It allows the follow of current in that direction and it takes in more current at the same voltage. When the voltage is reversed, thus the reverse bias voltage exceeds the knee voltage, the voltage across it will be constant.



(1)



(2) $V_S = 20V$

$V_Z = ?$

max Current = 500mA = IS

$P_Z = 5W$

$$I_S = \frac{P_Z}{V_Z} \quad V_S = \frac{5}{500 \times 10^{-3}} = 10V$$

$\therefore V_Z = 10V$

$$R_S = \frac{V_S - V_Z}{I_Z} = \frac{20-10}{500 \times 10^{-3}} = \frac{10}{500 \times 10^{-3}} = 20\Omega$$

$R_S = 20\Omega$

(3) $I_Z = I_S - I_L$ & $I_L = V_Z / R_L$

$$= \frac{10}{500} = 0.02\Omega$$

$= 20mA$

$\therefore I_Z = (500 - 20)mA = 480mA$