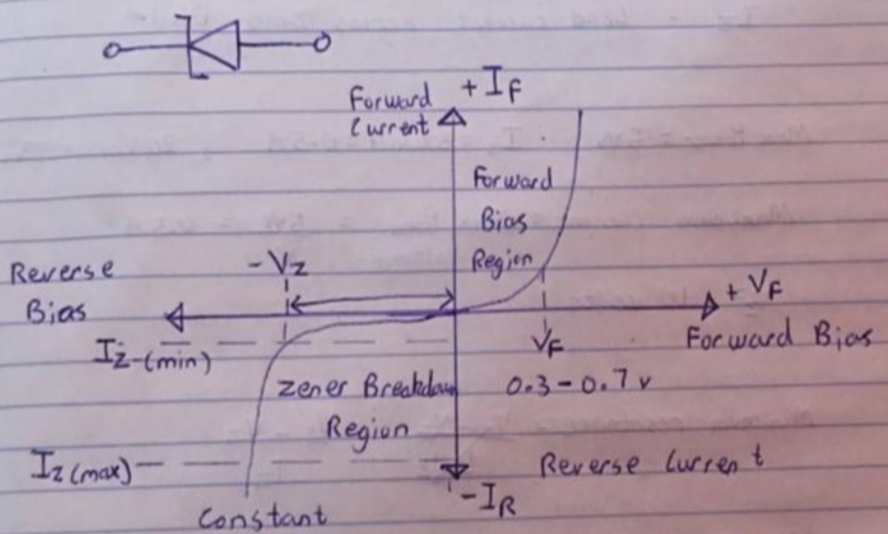
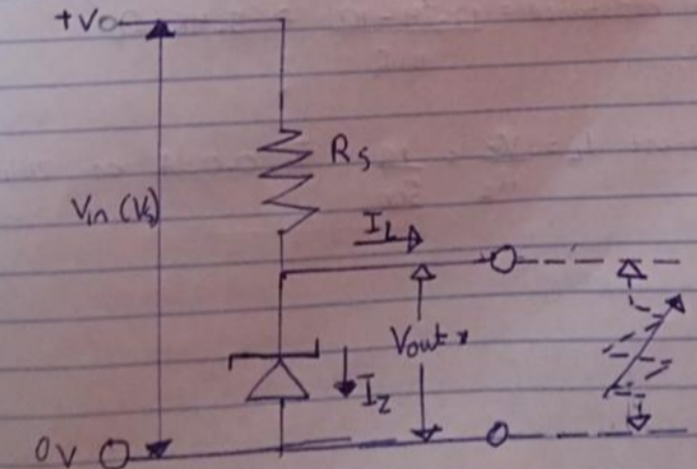
1 A zener diode is a diode similar to the standard PN junction diode but they are specially designed to have a low and specified Reverse Breakdown Voltage

i




I-V characteristics curve

ii



2 Max Power = 5W $I_Z$ = 500mA = 0.5A , 20$V_{max}$ = $V_s$

i Maximum Current = $\frac{\text{Max Power}}{\text{Voltage}} = \frac{5W}{V} = 0.5A$

$V_Z$ = 10 volts

Minimum resistance = ~~$\frac{V_s - V_z}{I_z}$~~ $\frac{V_s - V_z}{I_z}$

~~$V_s = 0$~~ $V_{dc} = 0.637 V_{max}$
$= 0.637 \times 20$
$= 12.74\ V_{dc}$

Minimum resistance = $\frac{12.74 - 10}{0.5} = 5.48\ \Omega$

ii Load current $I_L = \frac{V_Z}{R_L} = \frac{10}{500} = 0.02A$ or 20mA

$I_Z = I_S - I_L$
$= 500 - 20 = 480mA$