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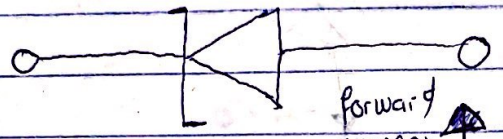
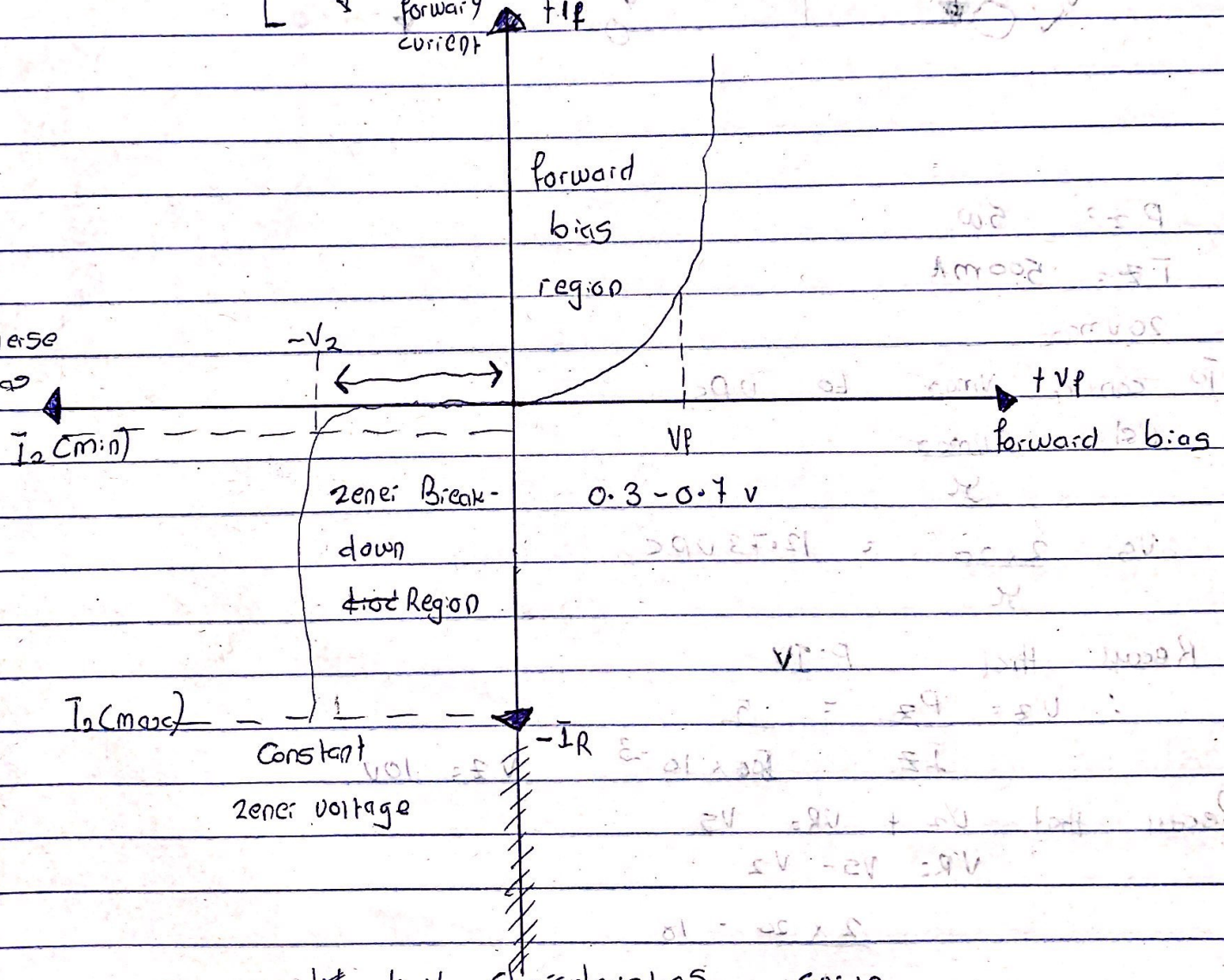
Dept: Biomedical Engineering
Matric: 18/ENG08/016
ENG 222 Assignment

1.) A zener diode is a diode similar to the standard PN junction diode, but they are specifically designed to have a low and specified Reverse breakdown voltage.

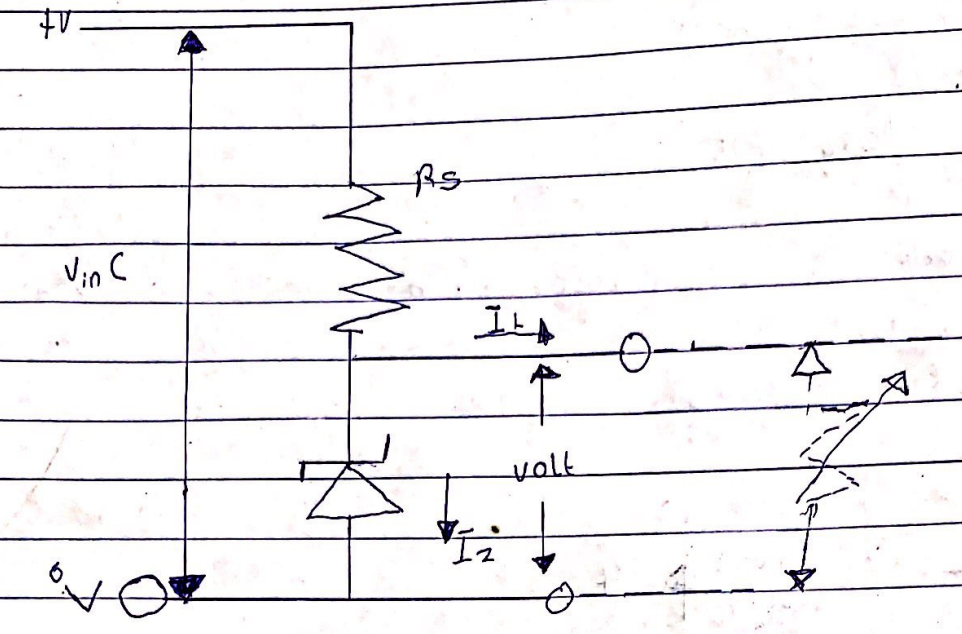
i)





ii) I-V characteristics curve

ii)



2:) $P_z = 5W$

$I_Z = 500mA$

$20 V_{max}$

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

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

$V_S = \frac{2 \times 20}{\pi} = 12.73 V_{DC}$

Recall that $P = IV$

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

Recall that $V_z + V_R = V_S$

$V_R = V_S - V_2$

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

$= 12.73 - 10 = 2.73 V$

$\therefore V = IR$

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

$R = 5.46$

11] Since IKS connected in series, and same current flow;

$I_S = I_Z + I_L$

$I_Z = I_S - I_L$

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

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

$I_Z = 500mA - 20mA$

$= 480mA = 0.48A$