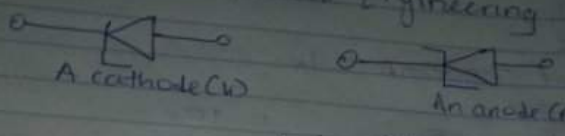
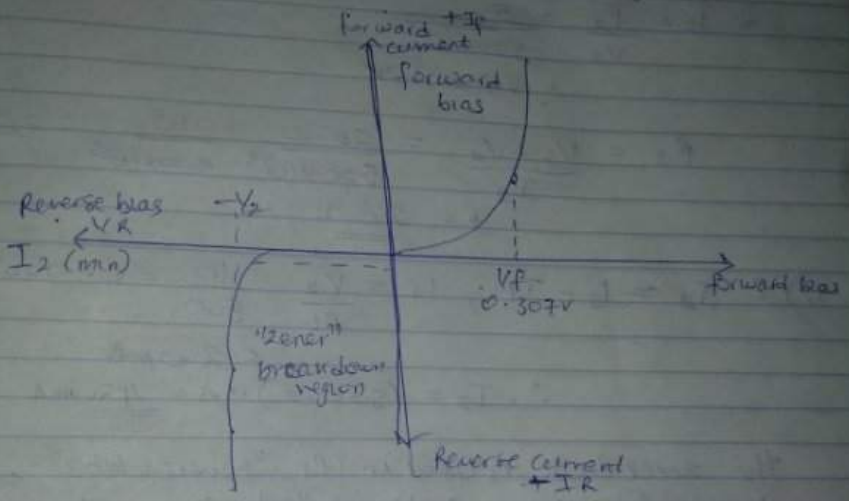
OKUMU EMBE OSAYAMEN CONA
18/ENG04/068
Elect/Elect Engineering

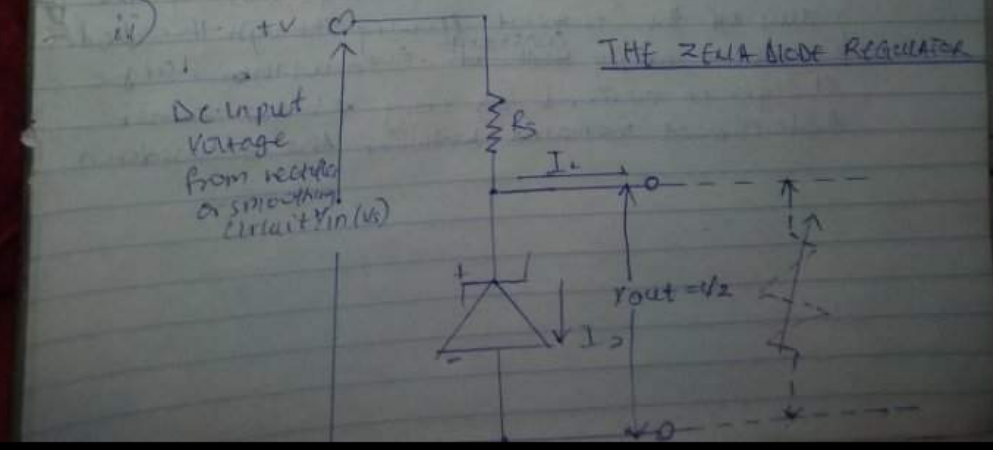
i)





THE ZENA DIODE IV CHARACTERISTICS CURVE

iii)



THE ZENA DIODE REGULATOR

2) i) $V_s = 20v$

$V_2 = 2$

max current = 500mA = I_s

$P_2 = 5W$

$i = I_s = \frac{P_2}{V_2} = \frac{5}{500 \times 10^{-3}} = 10v$

$\therefore V_2 = 10v$

$R_s = \frac{V_s - V_2}{I_2} = \frac{20-10}{500 \times 10^{-3}} = \frac{10}{500 \times 10^{-3}} = 20$

$R = 20\Omega$

ii) $I_2 = I_s - I_L$; $I_L = \frac{V_2}{R_L} = \frac{10}{500} = 0.02A$

$= 20mA$

$\therefore I_2 = (500 - 20)mA = 480mA$

The zener diode is used in it's "reverse bias" or reverse breakdown mode, i.e the diodes anode connected to the negative supply. The zener diode has a region in it's reverse bias characteristics of almost a constant negative voltage regardless of the value of the current flowing through the diode & remains nearly constant. Even with large changes in current as long as the zener diode current remains between the breakdown