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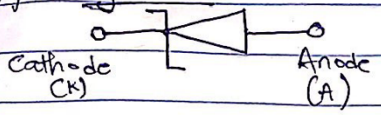
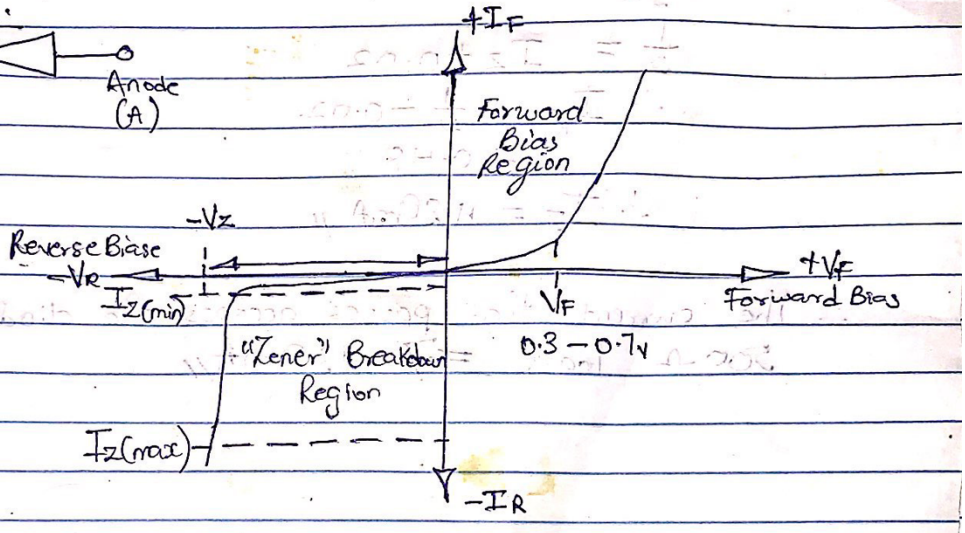
18/ENG02/013
COMPUTER ENGINEERING
BASIC ELECT

ASSIGNMENT

1.) i) A Zener diode is a diode similar to the standard PN junction diode but are specially designed to have a low and specified Reverse Breakdown Voltage. It is also known as Breakdown Diode. It is the simplest type of voltage regulator, and the point at which a Zener diode breaks down or conducts is called "Zener Voltage" (V_Z)

ii) Symbol.





2.) (I) (*) First Voltage of Zener diod =>

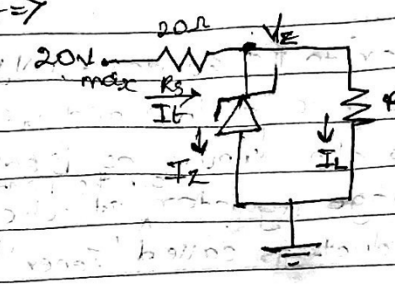
$$V = \frac{\text{Watts}}{\text{Current}} = \frac{5}{500mA} = 10V$$

This minimum Value =>

$$R_S = \frac{V_S - V_R}{F_Z} = \frac{20-10}{500mA}$$

$$R_S = 20\Omega //$$

II) If for load Resistance of 500 connected accross the diode, Then Current =>



Load Current, $I_L = \frac{V_z}{R_L}$

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

$I_L = 20mA$ //

Recall $I_t = I_z + I_L$

$\frac{20-10}{20} = I_z + 20\times10^{-3}$

$\frac{1}{2} = I_z + 0.02$

$\therefore I_z = \frac{1}{2} - 0.02$

$= 0.48$

$\therefore I_z = 480mA$ //

∴ The current that passes accross the diode to the 500Ω load $\Rightarrow$ 480mA //