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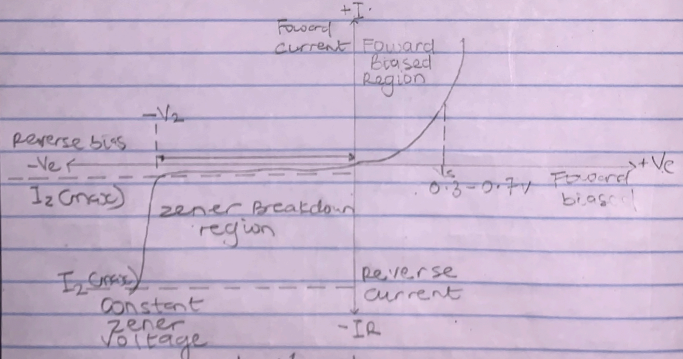
DEPT: BIOMEDICAL ENGINEERING
ELECT-ELECT

① A zener diode regulator consists of a current limiting resistor R_S connected in "series" with the input voltage V_S with the zener diode connected in "Parallel" with the Load R_L in this reverse biased condition. The stabilised output voltage is always selected to be the same as the breakdown voltage V_Z of the diode

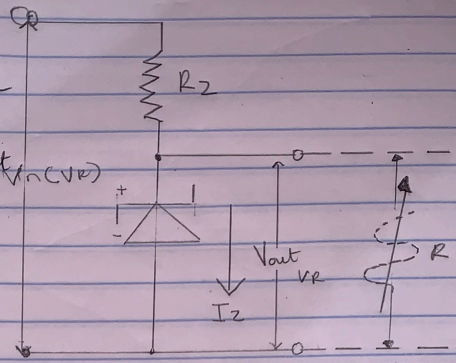
Symbols

(a) Anode — cathode OR Anode — cathode



I-V characteristic curve

X input voltage
m rectifier or
oothening circuit



Circuit diagram of a zener diode regu

oltage of zener diode (First)

$$V_Z = \frac{\text{Watt}}{\text{Current}} = \frac{5}{500\text{mA}}$$

$\therefore$ 500mA $\simeq$ 0.5ampere

$\therefore \frac{500}{1000} \simeq 0.5A$

$$= \frac{5}{0.5} = 10\text{Volts}$$

$\therefore$ The minimum value;

$$R_S = \frac{V_S - V_Z}{I_{Z}} = \frac{20-10}{500\text{mA}} = \frac{10}{0.5A} = 20\Omega$$

$\therefore R_S = 20\Omega$

ener current is 500Ω - Resistence.

$$I_Z = \frac{V_Z}{R_L} = \frac{10}{500\Omega}$$

$= 0.02$Ampere