

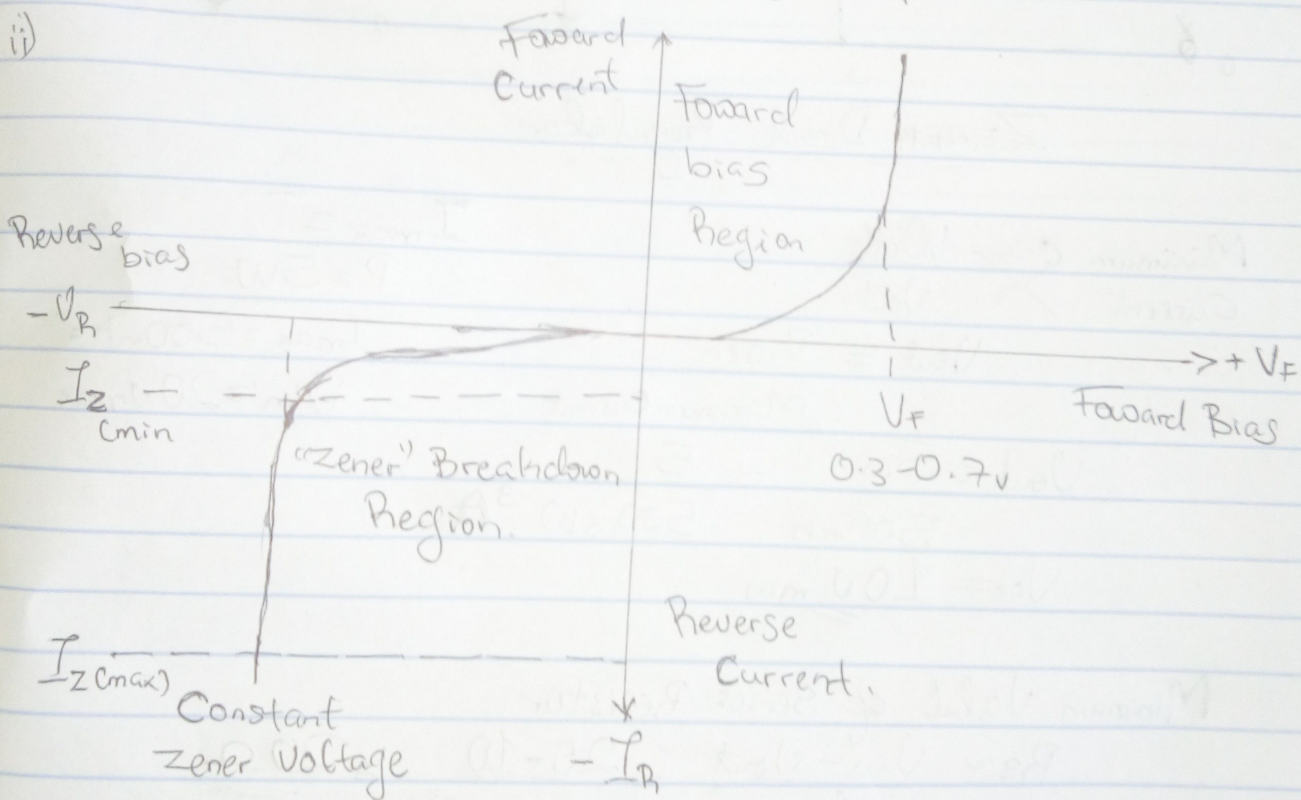
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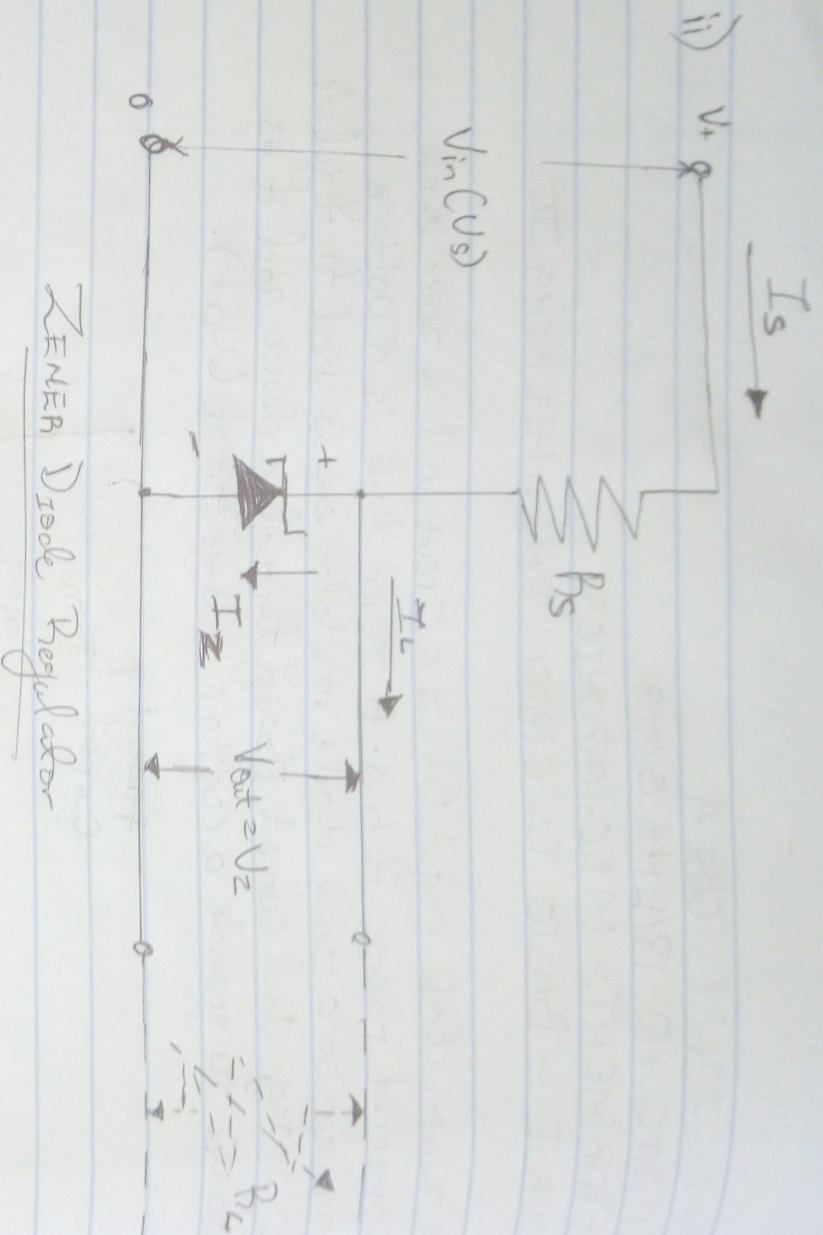
DEPARTMENT :- MECHATRONICS

COURSE :- BASIC ELECTRICAL ENGINEERING II.

1) A Zener diode regulator is a circuit with a zener diode connected reverse bias. A Zener diode is a voltage regulator. So a zener diode regulator is used to regulate the voltage and current flowing through a device and it is also use to provide a constant voltage output (V_{out}).



Zener diode I-V Characteristic Curve



2) Maximum ~~Current~~ Watts Current

$$V_{out} = \frac{\text{Power}}{\text{Maximum Current}}$$

$$V_{out} \approx \frac{5 \text{ W}}{500 \text{ mA}} = \frac{5}{500 \times 10^{-3} \text{ A}}$$

$$V_{out} = 10 \text{ V} \approx \text{min}$$

Minimum Value of Series Resistor

$$R_s \approx \frac{V_{in} - V_{out}}{I_{\text{max}}} = \frac{20 - 10}{500 \times 10^{-3} \text{ A}} \approx 20 \Omega$$

ii) The current across the diode at full $500 \Omega \Rightarrow R_L$

$$I_L \approx \frac{V_{out}}{R_L} \approx \frac{10 \text{ V}}{500 \Omega} = 0.02 \text{ A} = 20 \text{ mA}$$