

# ZENER DIODES

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**DEPT. : CHEMICAL**

**ENGINEERING**

**COURSE. : BASIC**

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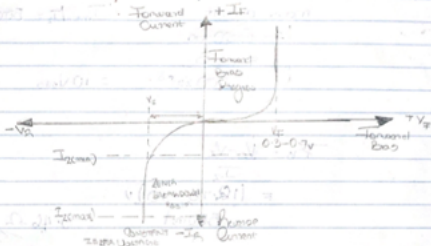
**ENGINEERING**

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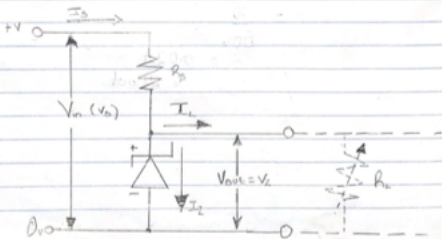
## Online Assignment

Q) Describe A zener Diode

- A Zener diode is used in its reverse bias or
- A Zener diode or 'Breakdown diode' as it is called. They are designed to have a low pre-determined Reverse Breakdown Voltage that takes advantage of this high reverse voltage.



### Zener Diode HV/Current Limitations



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i) Minimum Value of the Series Resistor

$$R_D = \frac{V_D - V_Z}{I_Z}$$

$$I_Z = 500 \text{ mA}$$

$$V_D = 20 \text{ V max} \quad V_Z = 5 \text{ V ?}$$

$$= 2 \times 20$$

$$\uparrow$$
$$2 \times 6.36 \text{ Vdc} = 12.73 \text{ Vdc}$$

$V_Z =$  maximum voltage

$\Rightarrow$  max. General Power

max. current

$$= 500 \times 10$$

$$= 5$$

$$500 \times 10^{-3}$$

$$P_{\text{max}} = 5 \text{ W}$$

$$I_{\text{max}} I_Z = 500 \text{ mA}$$

$$= 10 \text{ V max}$$

$$\therefore R_D = \frac{V_D - V_Z}{I_Z}$$

$$= \frac{(12.73 - 5) \text{ V}}{500 \text{ mA}}$$

$$= 5.46 \Omega$$

$$ii) I_1 = \frac{V_Z}{R_1}$$

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

$$= 0.02 \text{ A}$$

$$= 20 \text{ mA}$$

Has