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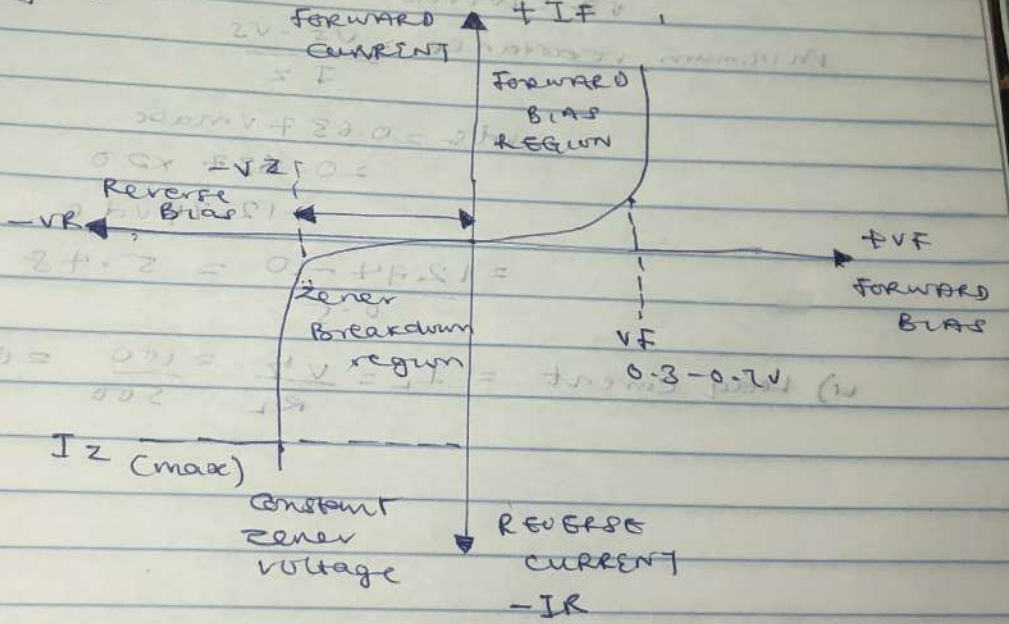
COMPUTER ENGINEERING
19/ENG02/081
BASIC ELECT

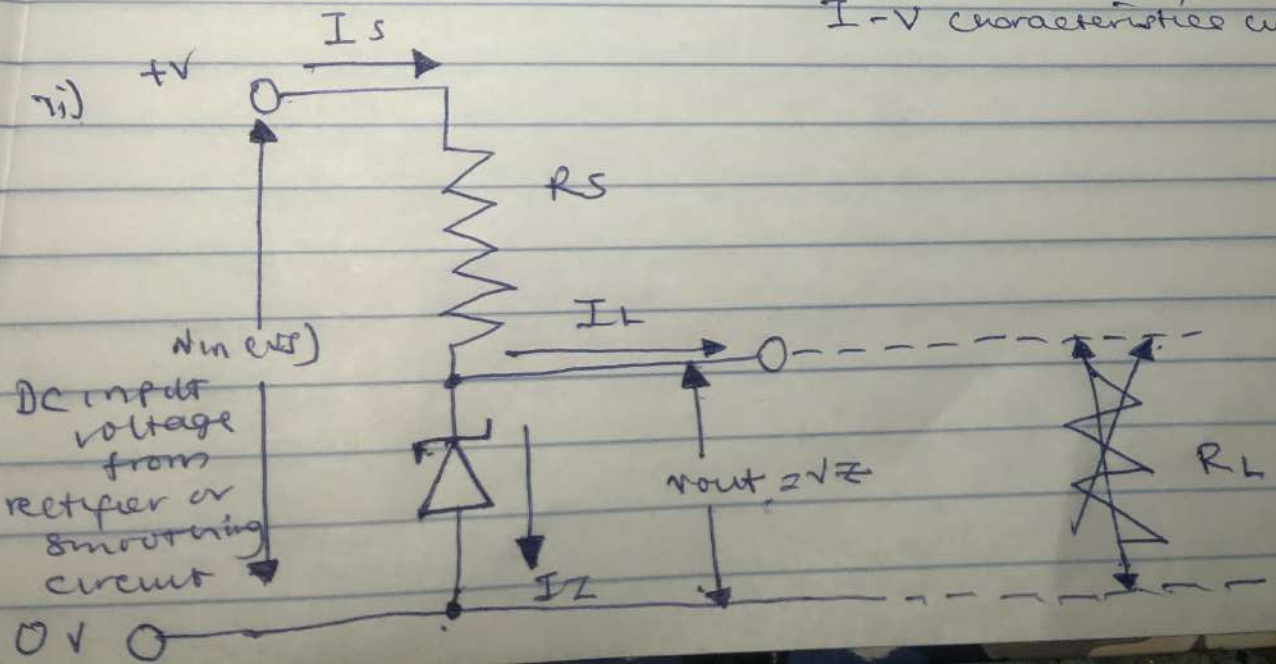
i) A zener diode is a diode similar to the standard PN junction diode but they are specially designed to have a low and specified reverse breakdown voltage.

SYMBOL



I-V characteristics curve

ii)



+ R_S = Resistor
+ V_S = voltage source
+ V_{out} = stabilized output voltage
+ R_L = Load resistance
+ I_Z = load current across zener diode

a) max power = 5W

$I_Z = 500mA = 0.5A$ 20v max = V_S

i) max current = $\frac{\text{max power}}{\text{voltage}} = \frac{5W}{V} = 0.5A$

V_Z = 10 volts

Minimum resistance = $\frac{V_S - V_S}{I_Z}$

$V_{dc} = 0.637 V_{max}$

$= 0.637 \times 20$

$= 12.74 V_{dc}$

$= \frac{12.74 - 10}{0.5} = 5.48$

ii) Load current = $I_L = \frac{V_Z}{R_L} = \frac{10}{500} = 0.02A$ or 20mA