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BASIC ELECT
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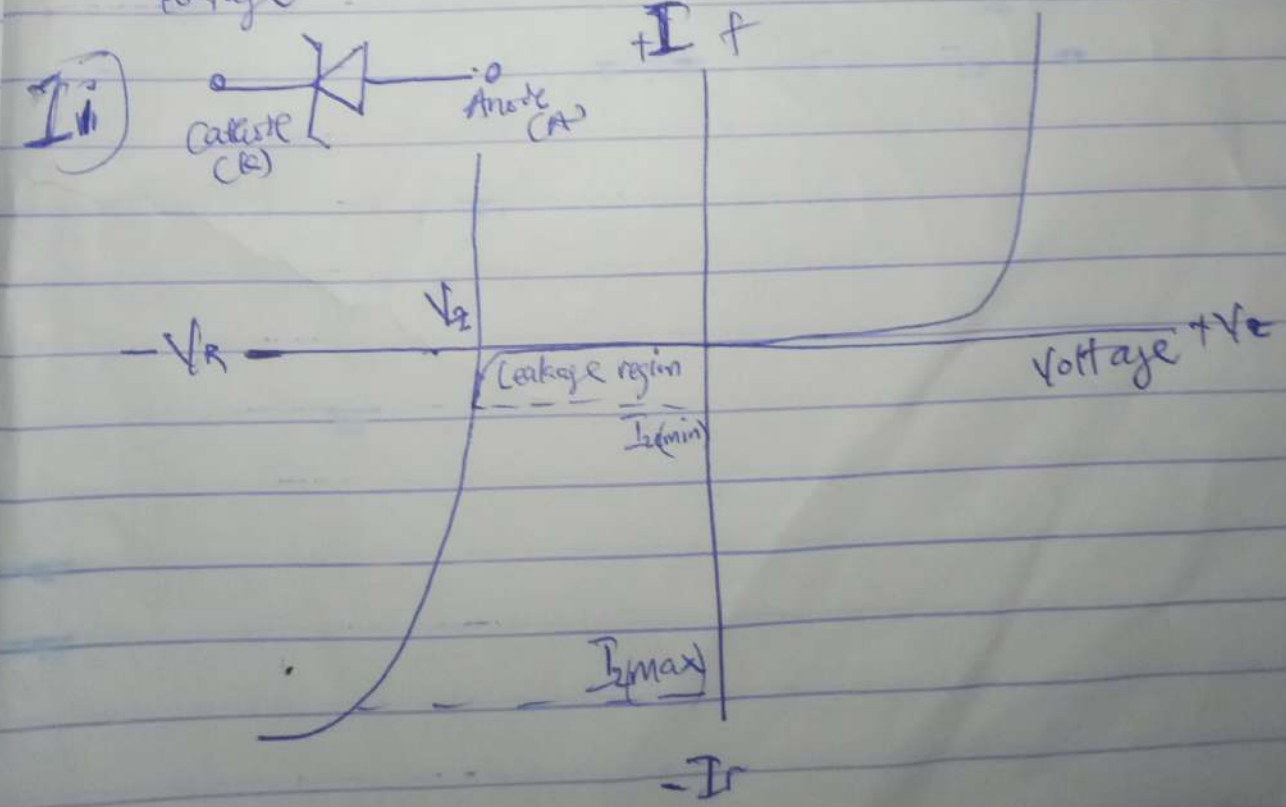
ELECTRICAL/ELECTRONICS

(1) A Zener diode is always operated in its reverse biased condition. As such a simple voltage regulator circuit can be designed using a Zener diode to maintain a constant DC output voltage across the load in spite of variation in the input voltage or changes in the load current. A Zener diode of break down voltage V_2 is reverse connected to an input voltage source V_i across a load resistance R_L and a series resistor R_s. The voltage across the Zener will remain steady at its break down voltage V_2 for all the value of Zener current I_2 as long as the current remains in the break down region. Hence a regulated DC output voltage $V_o = V_2$ is obtained across R_L, whenever the input voltage remains within a minimum and maximum voltage

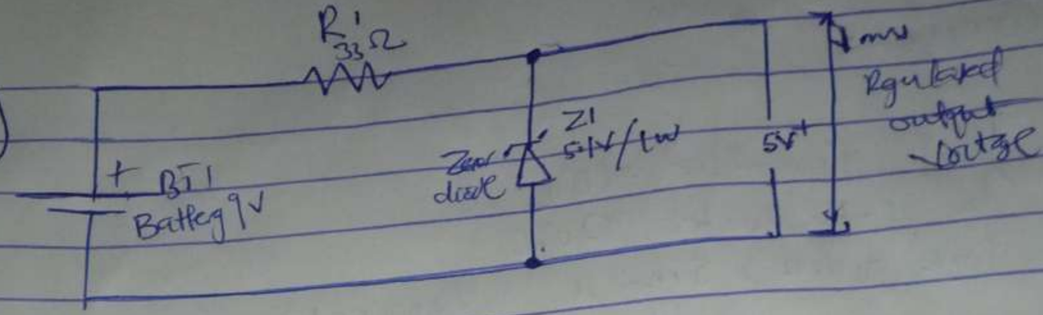
(ii)



(iii) Characteristics Curve

Afu

I_{11})



N02) · Min value = ?

$R_s = \frac{V_s - V_z}{I_z}$ where V_s =

Max current = Watt / Voltage

$800 = 5/x$ $x = 100$

V_s = 200mA = 12.74 200.637 × 20

$R_s = \frac{12.74 - 10}{500} = 4\ \Omega$

$I = \frac{V_z}{R_L} = \frac{10}{500} = 20$ mA

$I_2 = I_s - I_L$ = 500mA − 20mA = 480mA