

EXPERIMENT-5

AIM:

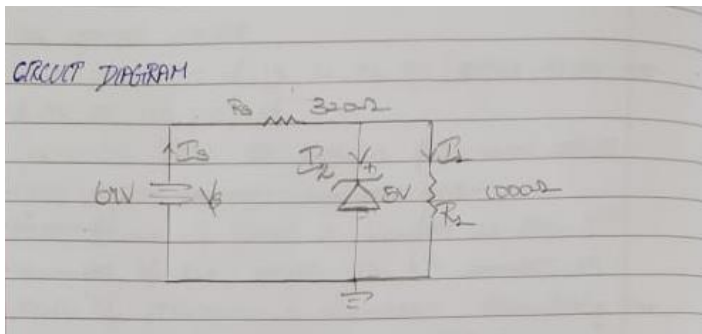
To examine whether zener regulator is working in breakdown region and calculate load current, zener current, current through series resistor, load voltage and verify it with multisim software.

THEORY:

The primary objective of Zener diode as voltage regulator is to maintain constant voltage. We use Zener diode to maintain a constant potential difference across the load resistance when supply voltage is more than Zener voltage.

PROCEDURE:

CIRCUIT DIAGRAM



CALCULATION

For a zener diode to work in breakdown region
 $V_{TH} > V_Z$

$$V_{TH} = \frac{R_L}{R_S + R_L} \times V_S = \frac{1000 \times 6}{320 + 1000} = 5.75V$$

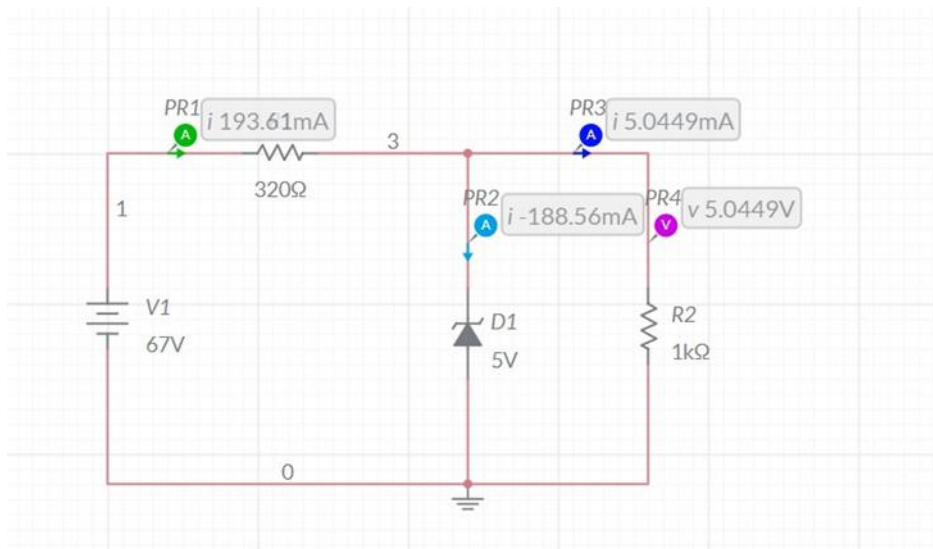
$\Rightarrow V_{TH} > V_Z$
Hence the zener diode operates in breakdown region

Using ohm's law
 $I_Z = \frac{V_Z}{R_L} = 5mA$

$$I_S = \frac{V_S - V_Z}{R_S} = \frac{6 - 5}{320} = 193.75\mu A$$

$I_S = I_Z + I_L$
 $I_L = 188.75\mu A$

MULTISIM:



CONCLUSION:

The value of Zener voltage, Zener current, current through series resistor , load current using theoretical calculations and through MULTISIM are same.

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