

(attending labs online)

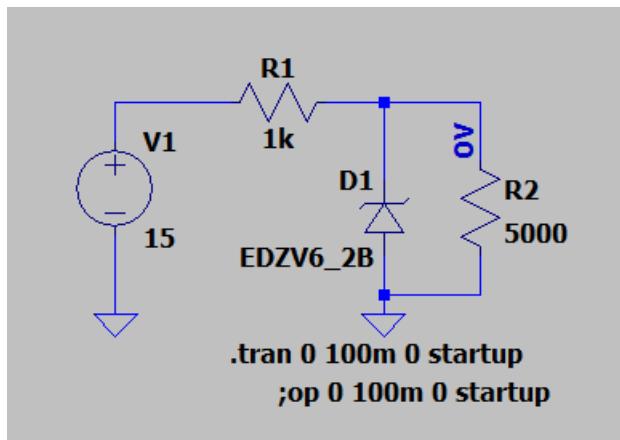
LAB REPORT 1

VOLTAGE REGULATOR USING ZENER DIODE

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- 1) Connect a DC input of 15V, a resistor of $1\text{k}\Omega$ and a zener diode rated at 5V . Connect a load resistor R_L across the diode. Draw this circuit in LTSpice & run transient simulation.

LTspice simulation:



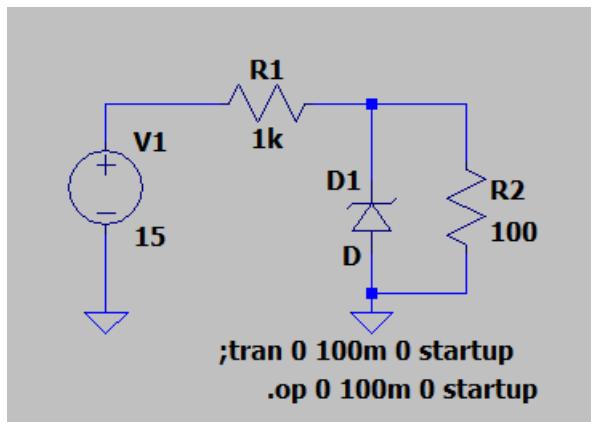
Output voltage across R2:



Output voltage across Zener diode is 6.2 V as the breakdown voltage of Zener diode is 6.2V for the diode in figure.

- 2) Insert a DC input of 15V to the regulator circuit and measure the output voltage across RL.
 Vary RL from 100Ω to $5K\Omega$ and note how the output voltage is changing (.op).

LTSimulation:



Output voltage across R2:

For 100 ohms – 6.2V

For 500 ohms – 6.2V

For 1000 ohms – 6.2V

For 2000 ohms – 6.2V

For 3000 ohms – 6.2V

For 4000 ohms – 6.2V

For 5000 ohms – 6.2V

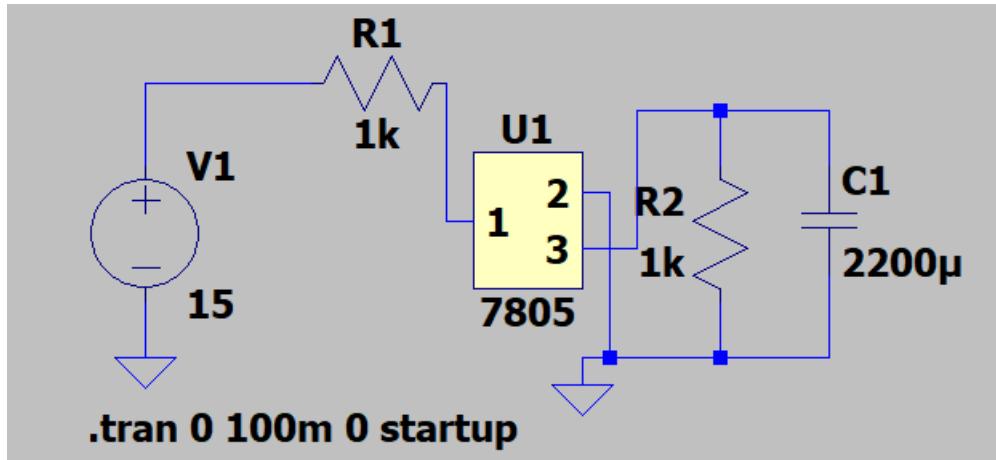
Output voltage remains constant across load resistance because Zener diode maintains constant voltage across its ends.

* C:\Users\venka\Desktop\EW-1\Draft1.asc

--- Operating Point ---

V(n001):	15	voltage
V(n002):	6.19885	voltage
I(D1):	-0.00756139	device_current
I(R2):	0.00123977	device_current
I(R1):	-0.00880115	device_current
I(V1):	-0.00880115	device_current

3) IC7805 maintains constant voltage across its ends.



Constant voltage of 5V is observed across its ends.