

Zener diode as Voltage Regulator :

Aim :

To simulate the line and load regulation operation zener diode.

Apparatus Required :

Laptop with proteus software.

Theory :

A heavily doped PN Junction diode is called zener diode. Due to heavily doped nature zener diode works under forward bias and reverse bias conditions.

Zener diode under reverse bias condition is used as a voltage regulator. Even if input voltage changes the output is constant. This is called line regulation.

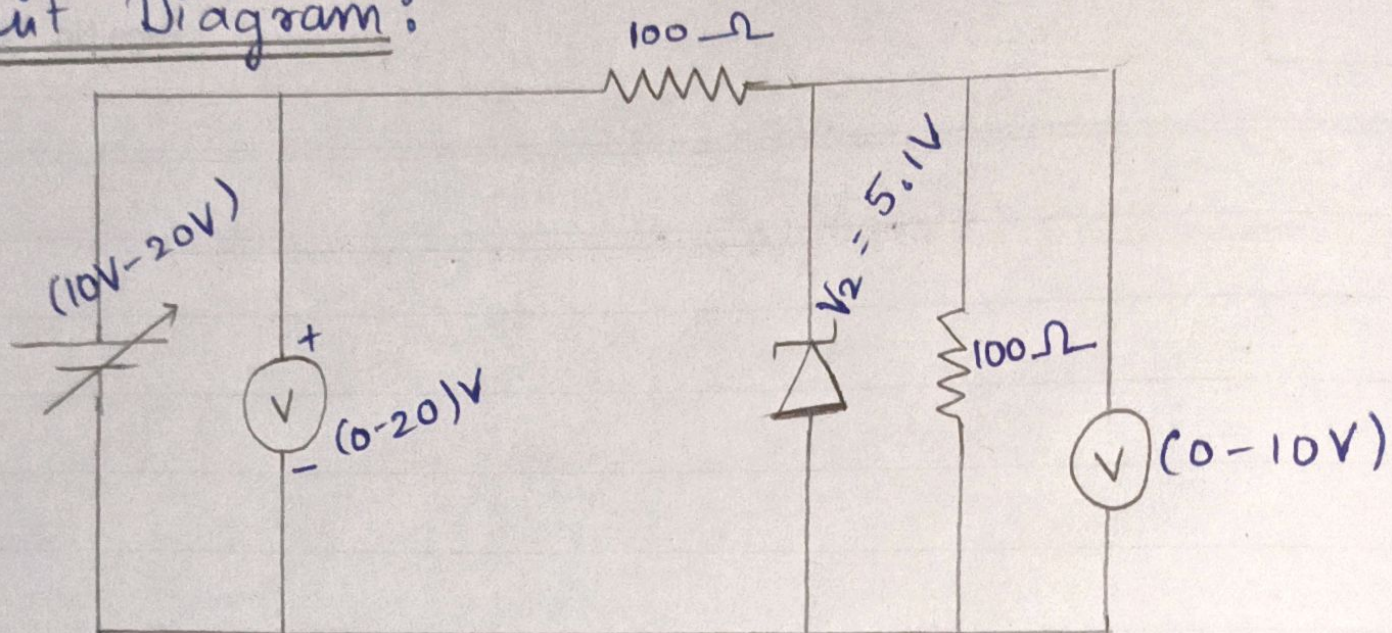
If the load resistance changes the output voltage is constant this is called load Regulation.

PROCEDURE :

1. Drag the required components from the proteus library.

Line Regulation :-

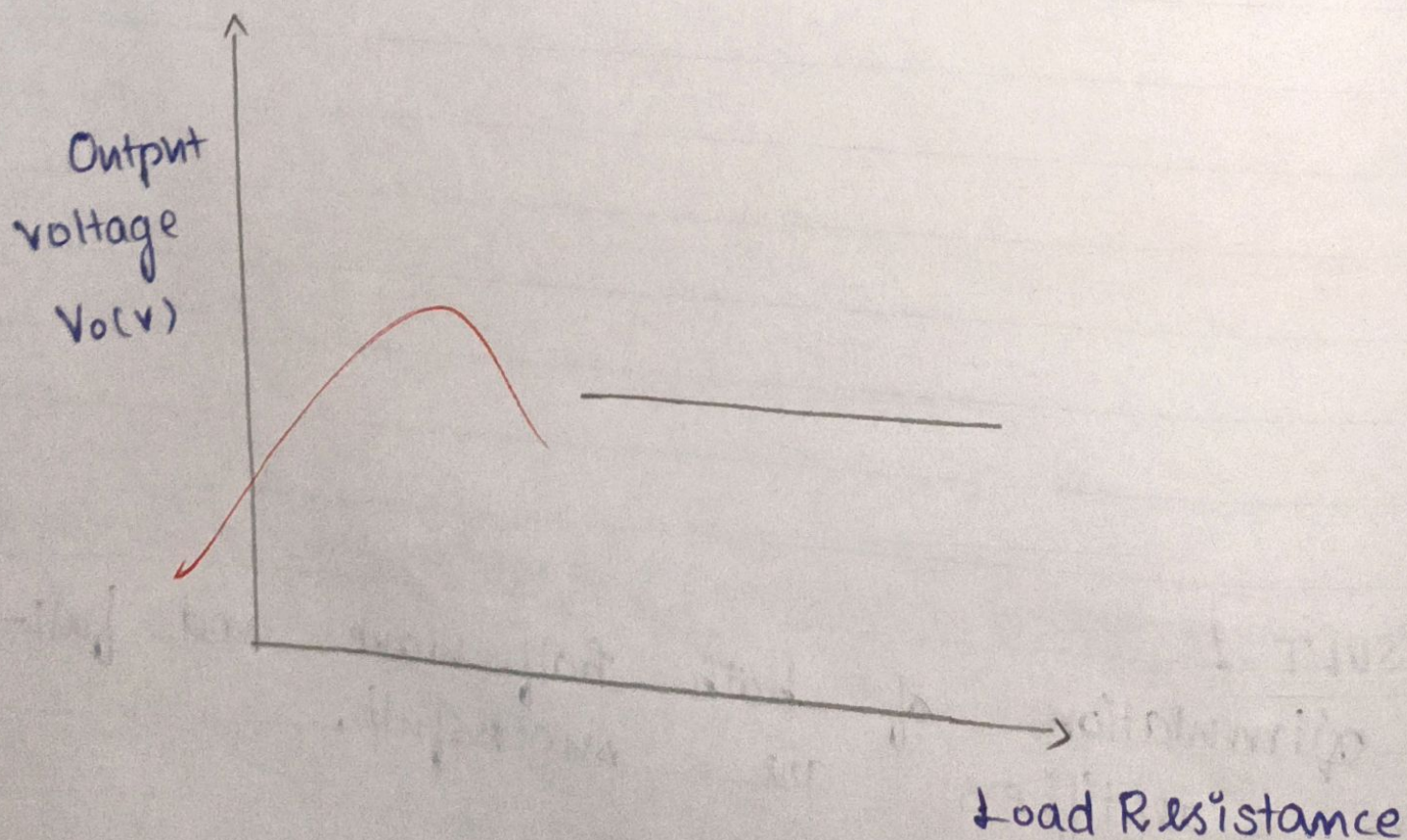
Circuit Diagram:



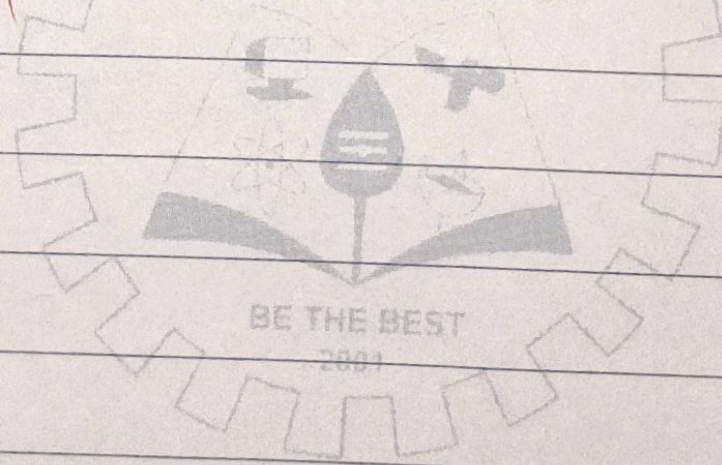
Tabulation:

s.no	Input voltage V_i (V)	Output Voltage V_o (V)
1	+12.0	+5.14
2	+13.0	+5.16
3	+14.0	+5.17
4	+15.0	+5.17
5	+16.0	+5.18
6	+17.0	+5.19

Model Graph:

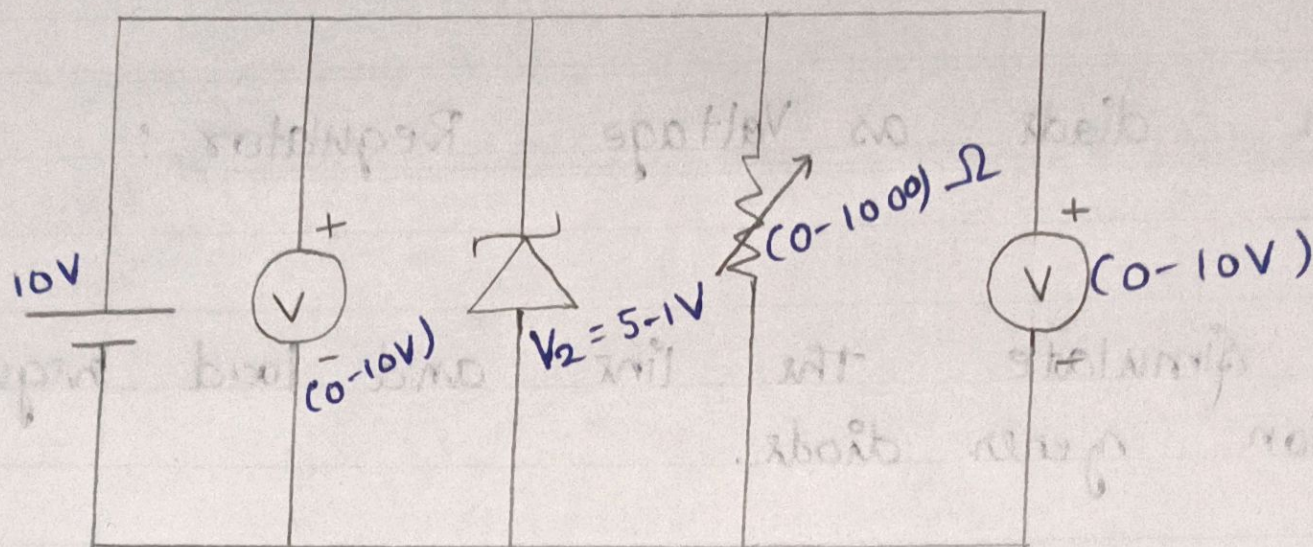


2. Connect the components (required) as per circuit diagram.
3. For line regulation vary the input voltage and note the output voltages in tabulation. Draw the graph between input voltage and output voltage.
4. For load regulations vary the load resistance and note the output voltage in tabulation. Draw the graph between load resistance and output voltage.



Load Regulation:

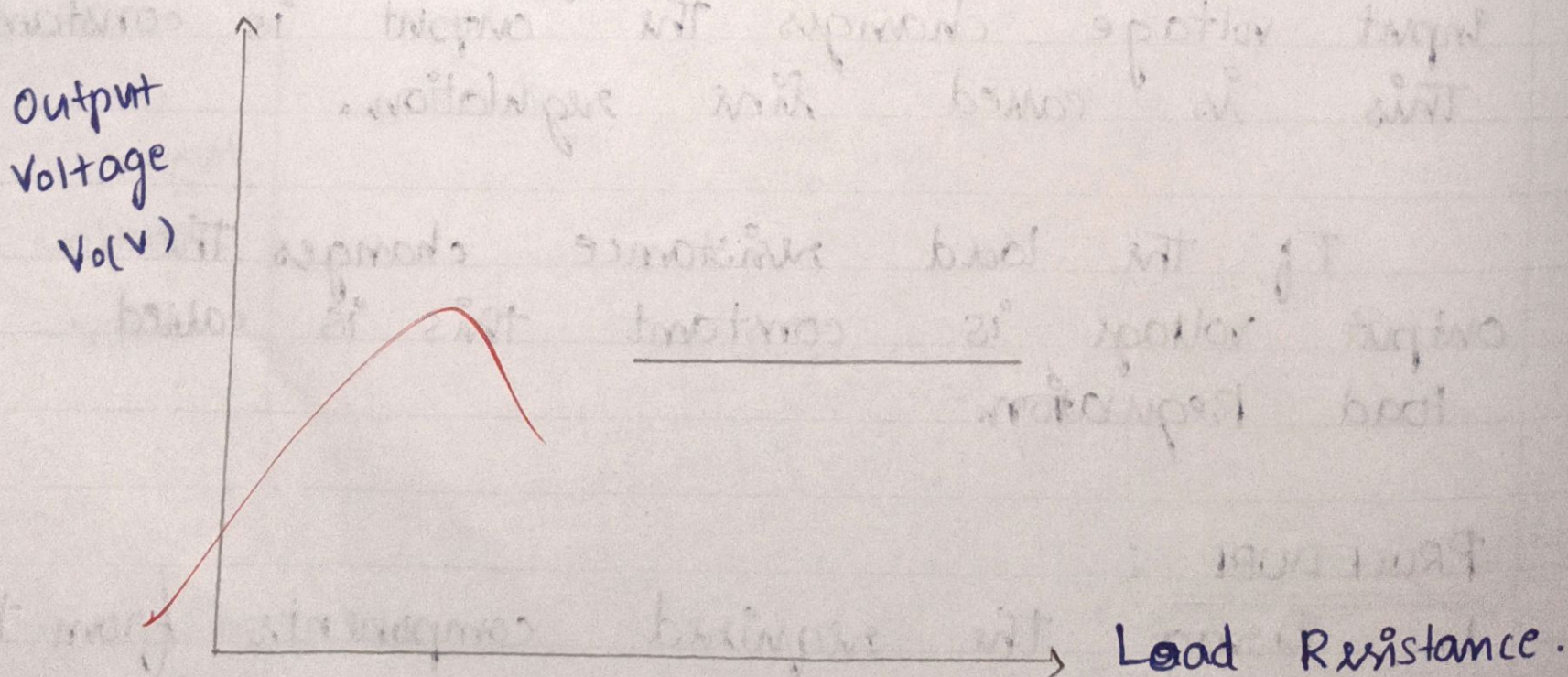
Circuit Diagram:

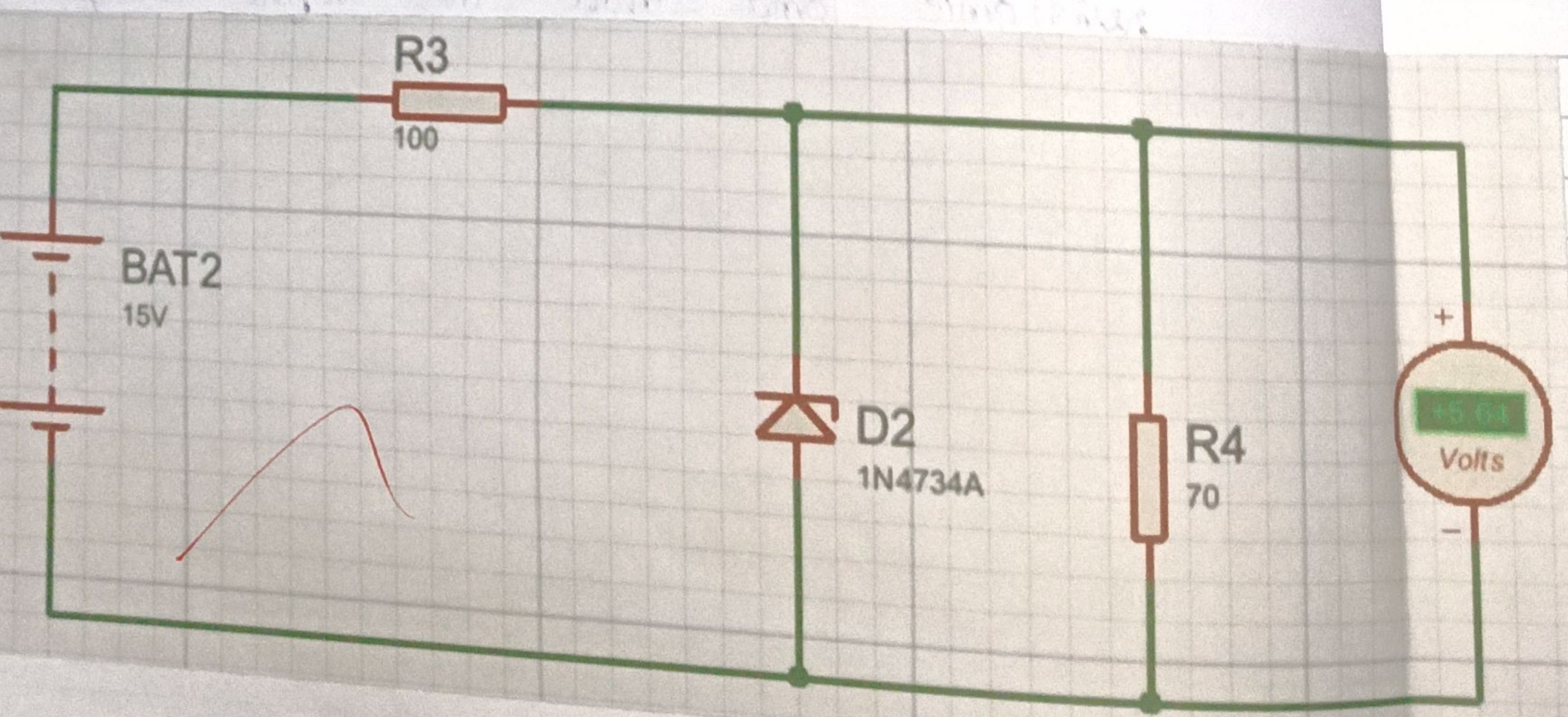
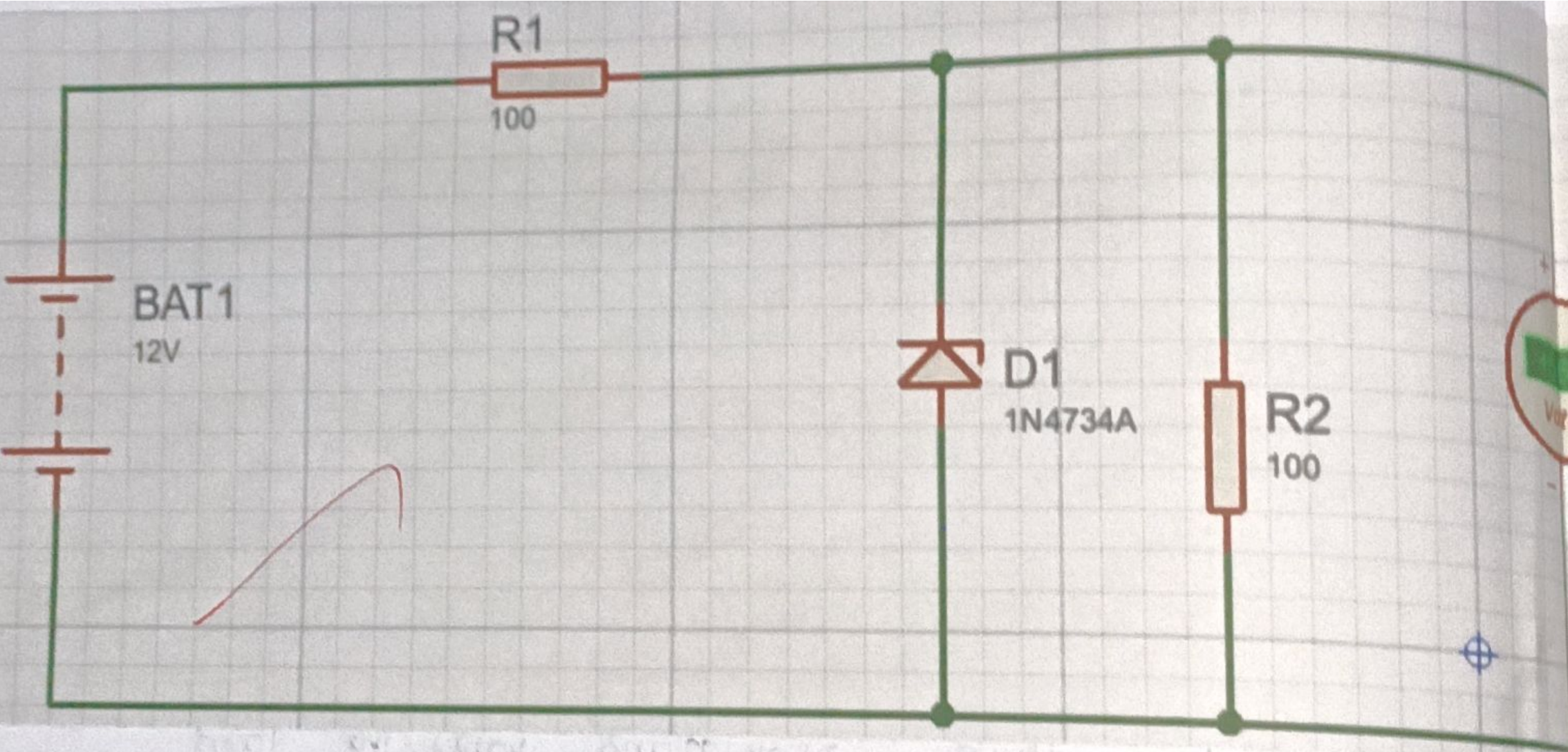


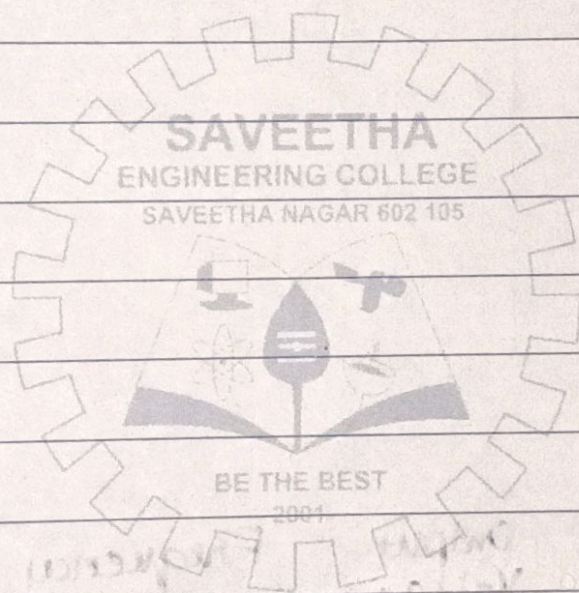
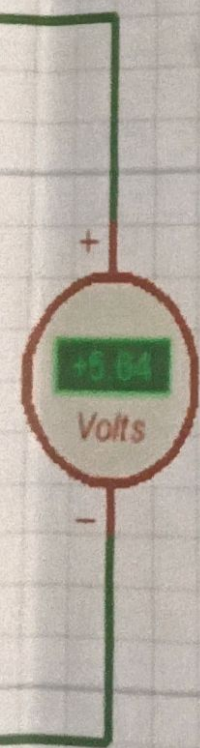
Tabulation:

S.No	Load Resistance $R_2(\Omega)$	Output voltage $V_o(V)$
1	100 Ω	+ 5.19
2	200 Ω	+ 5.20
3	300 Ω	+ 5.20
4	400 Ω	+ 5.20
5	500 Ω	+ 5.20
6	600 Ω	+ 5.21

Model Graph:







RESULT:

Thus stimulation of line and regulation operation of zener diode successfully completed.