EXPT NO: 5

ZENER DIODE AS VOLTAGE REGULATION

AIM:

To simulate the line and load regulation operation Zener diode.

APPARATUS REQUIRED:

Laptop with proteus software.

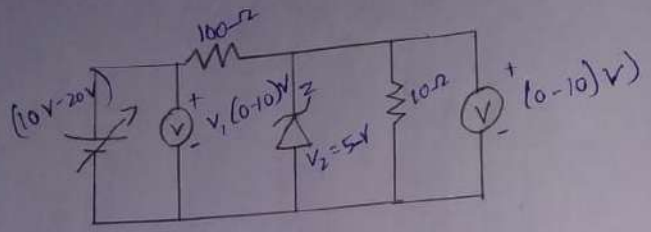
THEORY:

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 the 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.

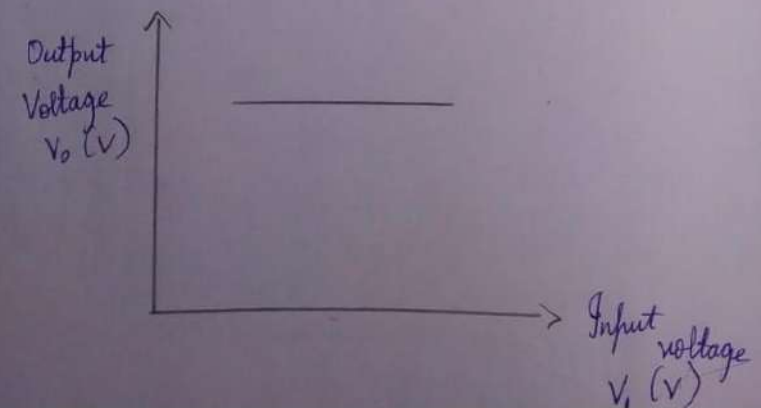
CIRCUIT DIAGRAM:



TABULATION:

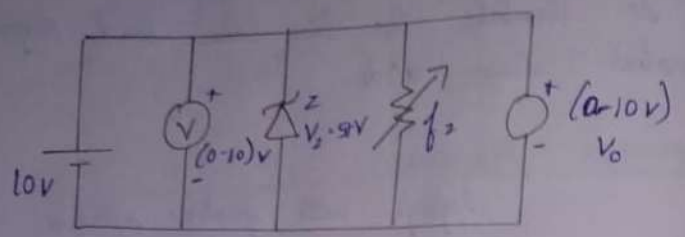
S.No	INPUT VOLTAGE V_i (V)	OUTPUT VOLTAGE V_o (V)
1	+12.0	+5.14
2	+13.0	+5.16
3	+14.0	+5.17
4	+15.0	+5.17
5	+16.0	+5.18
6	+17.0	+5.19

MODEL GRAPH:



CIRCUIT DIAGRAM:

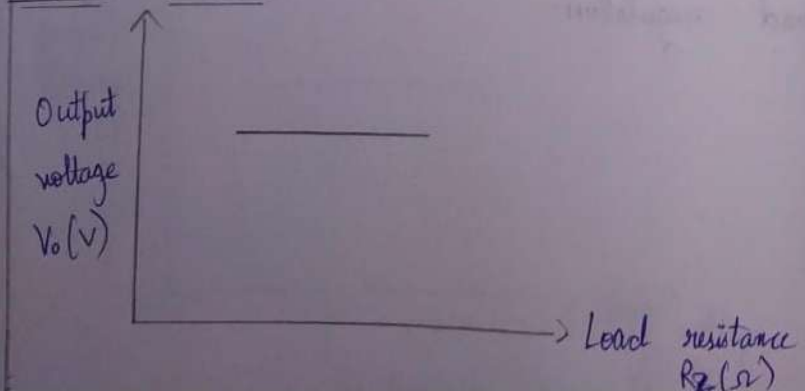
LOAD REGULATION



TABULATION:

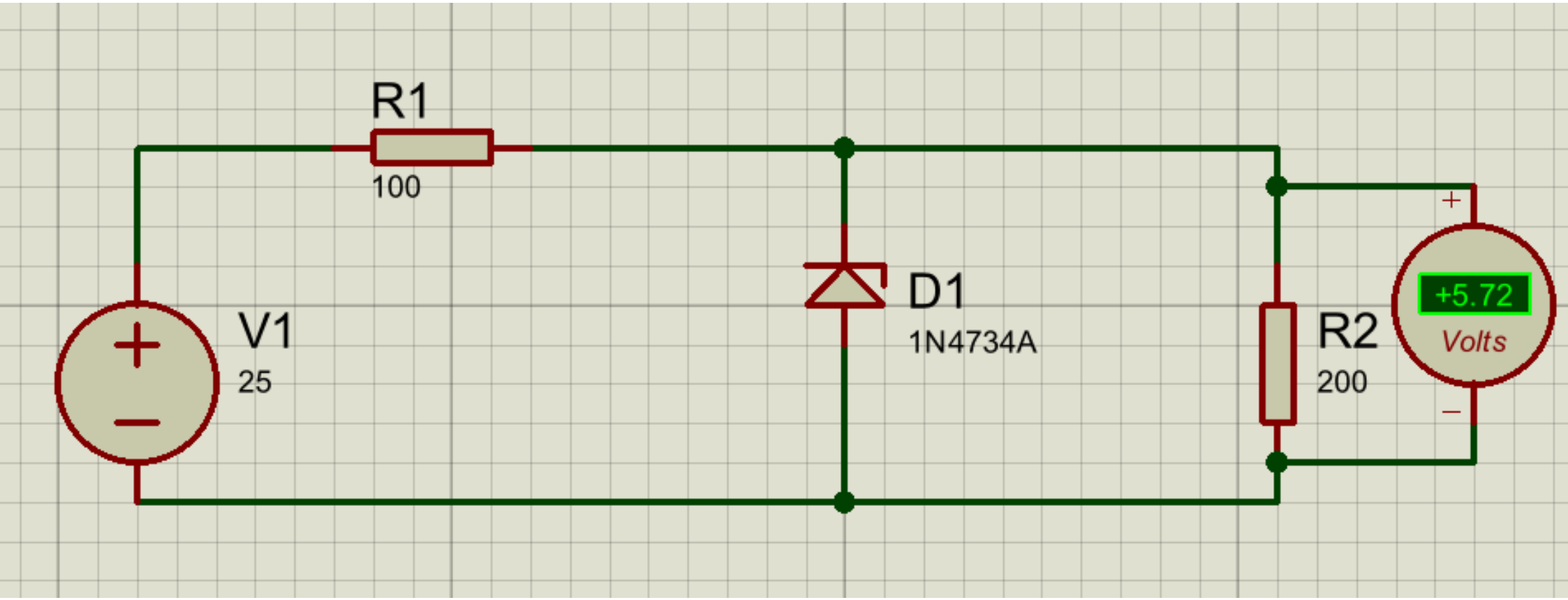
S.No	LOAD RESISTANCE R_2 (Ω)	OUTPUT VOLTAGE V_o (V)
1	100 Ω	+5.19
2	200 Ω	+5.20
3	300 Ω	+5.20
4	400 Ω	+5.20
5	500 Ω	+5.20
6	600 Ω	+5.21

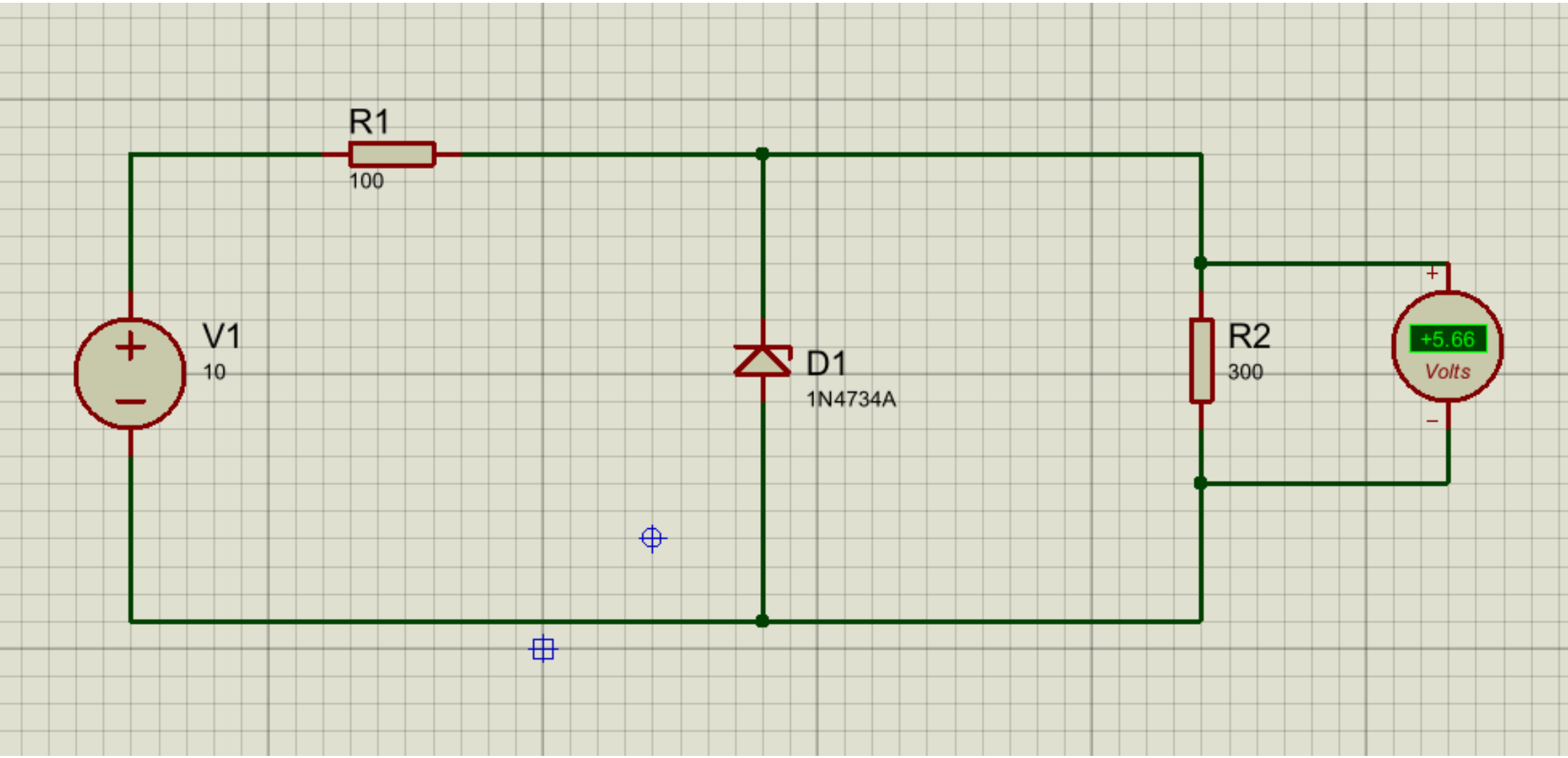
MODEL DIAGRAM:



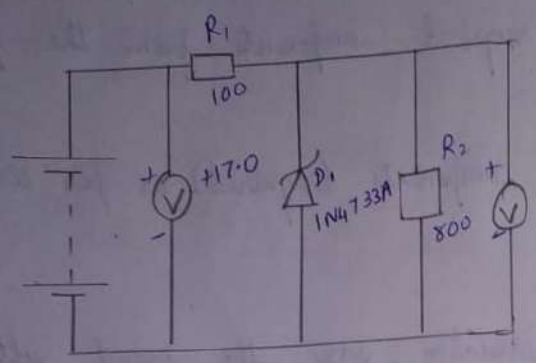
PROCEDURE:

1. Drag the required components from the proteus library.
2. Connect the components (required) as per circuit diagram.
3. For line regulation, vary the input voltage and not 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 tabulations. Draw the Graph between load resistance and output voltage.


R1
100
V1
25
D1
1N4734A
R2
200
+
+5.72
Volts
–


R1
100
V1
10
D1
1N4734A
R2
300
+
+5.66
Volts
–

OUTPUT:

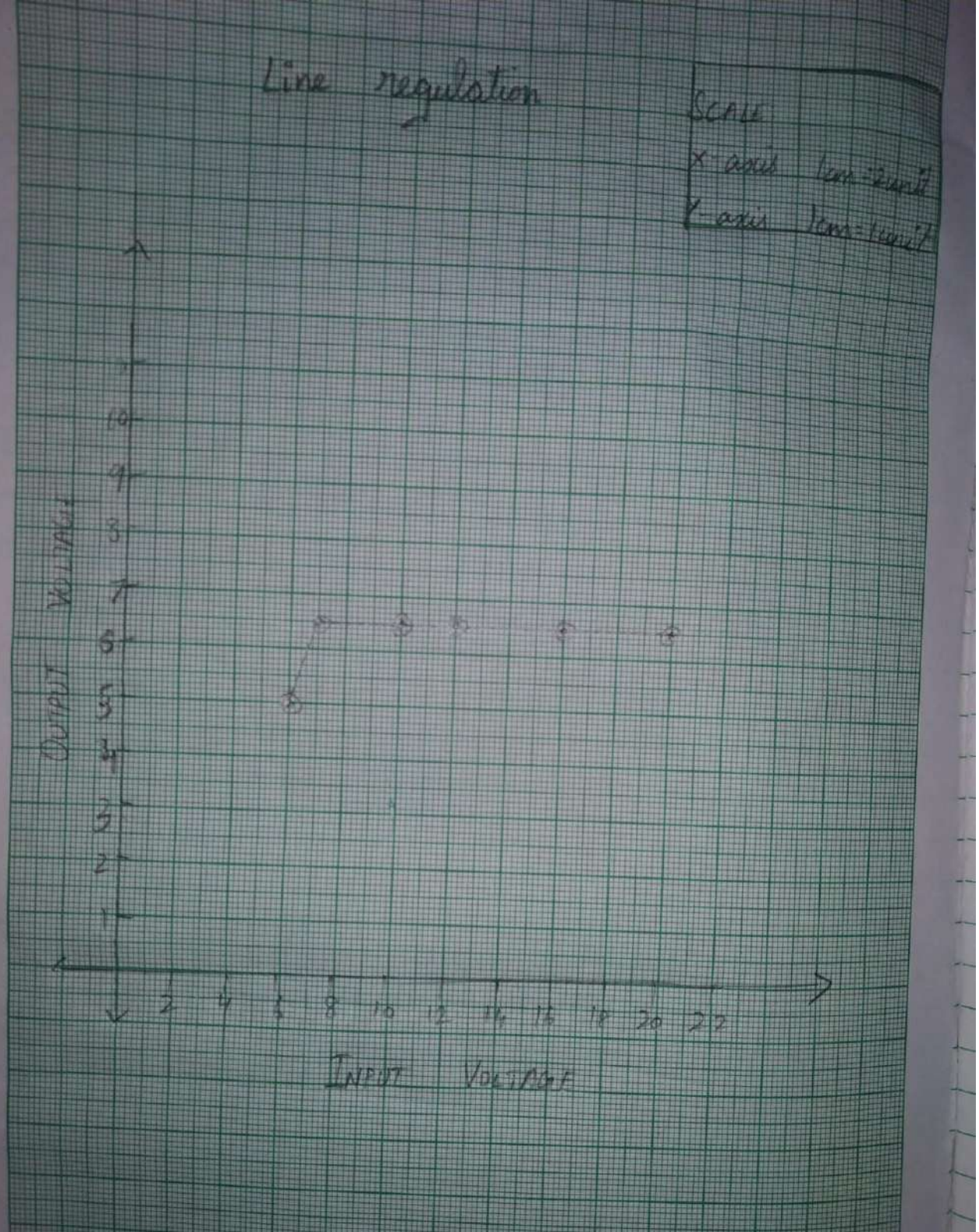


RESULT:

Thus simulation of line load regulation operation of Zener diode is successfully completed.

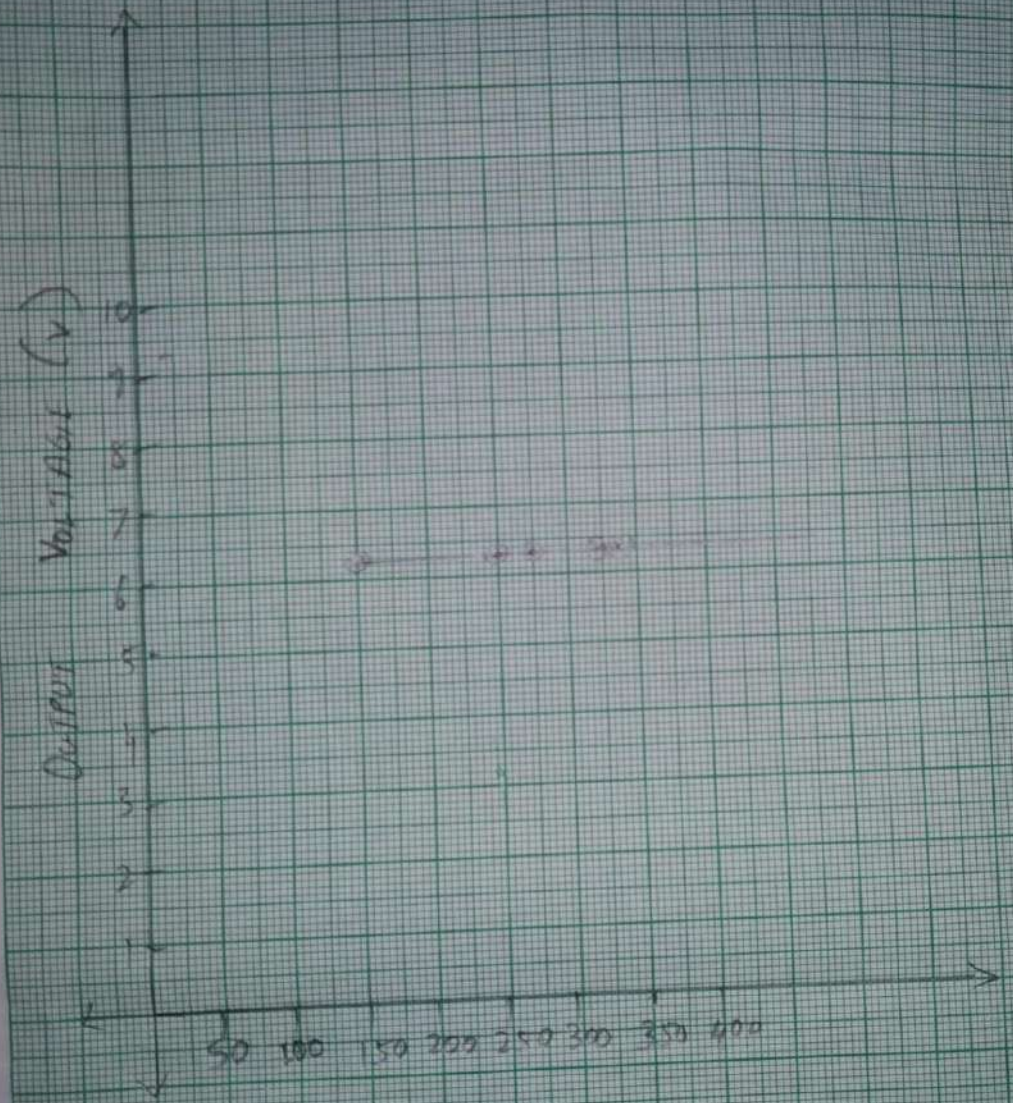
Line regulation

Scale:
x axis 1cm = 1unit
Y axis 1cm = 1unit



Load regulation

Scale

X-axis 1cm = 50 watts

Y-axis 1cm = 1 volt