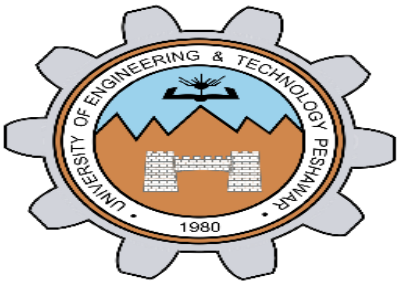
LAB REPORT NO 7



CSE-206L Electronic Circuits Lab

Submitted by: **Muhammad Ali**

Registration No: - **19PWCSE1801**

Class Section: A

"On my honor, as student of University of Engineering and Technology, I have neither given nor received unauthorized assistance on this academic work."

Submitted to:

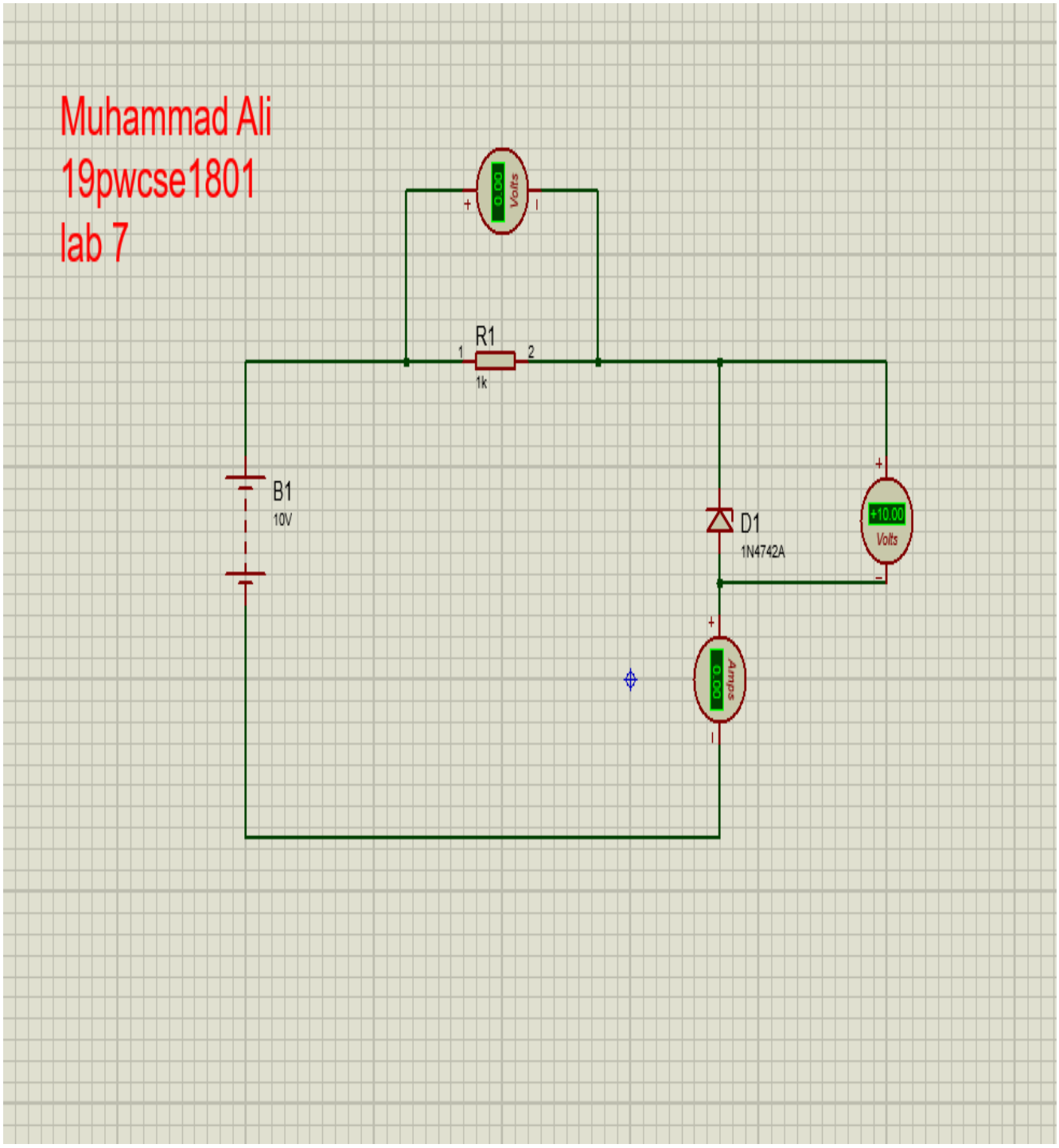
Engr. Abdullah Hamid

Data:(20,06,2021)

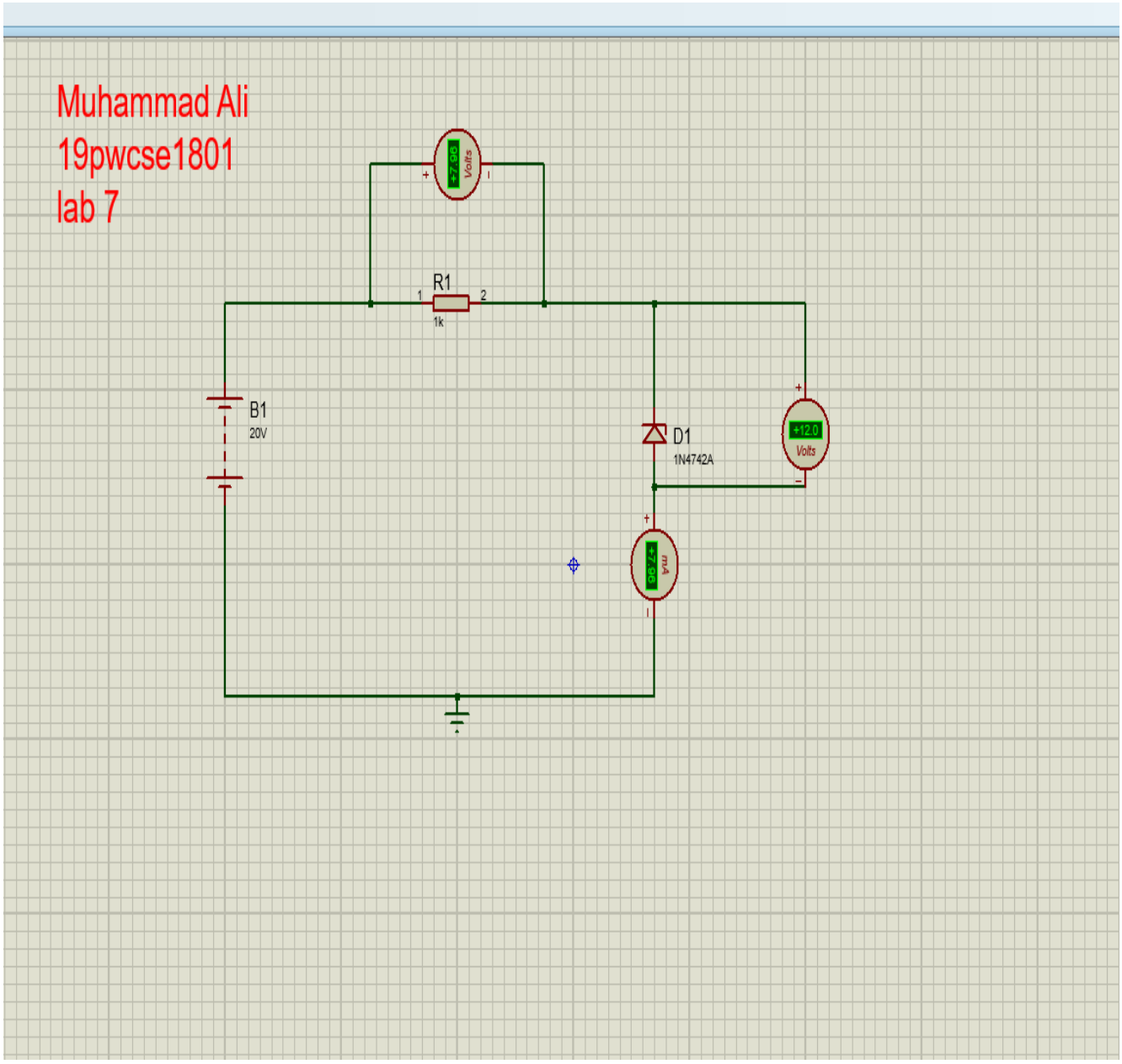
Department of Computer Systems Engineering

University of Engineering and Technology, Peshawar

For Vin<Vz: -


Muhammad Ali
19pwcse1801
lab 7
0.00
Volts
R1
1
2
1k
B1
10V
D1
1N4742A
+10.00
Volts
0.000
Amps

For Vin>Vz: -


Muhammad Ali
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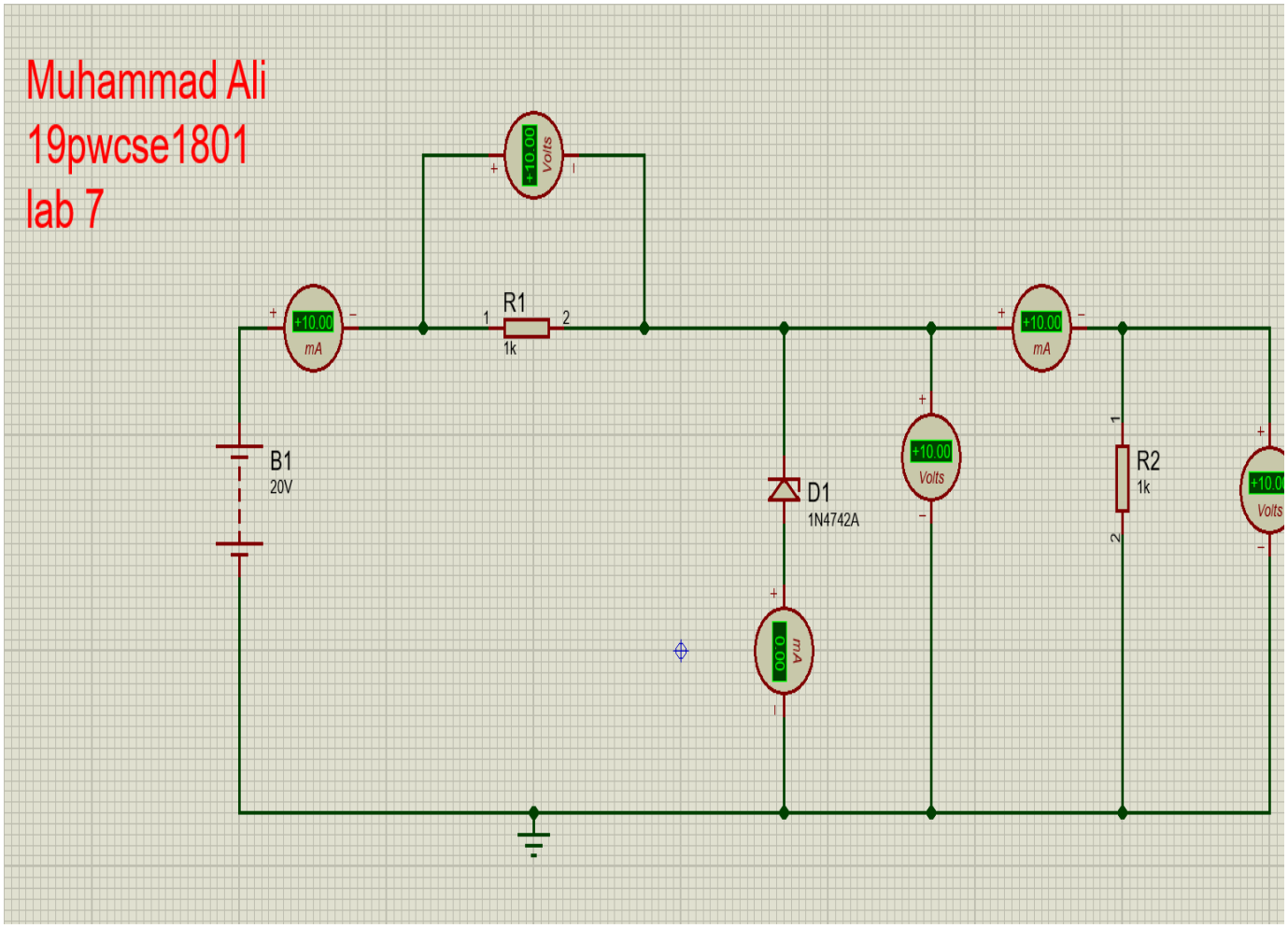
lab 7
+7.24
Volts
R1
1k
B1
20V
D1
1N4742A
+12.0
Volts
+7.63
mA

Zener Diode reading: -

V_{in}	V_z	V_s	I_s
2	2V	0	0
5	5V	0	0
10	10V	0	0
12	11.9V	0.08V	0.08mA
15	12V	2.98V	2.98mA
20	12V	7.96V	7.96mA

Part B:

DOIDE as regulator: -



According to the circuit,

R_L = load resistor

R_s = voltage control resistor

V out = output voltage at load resistor.

Vin = input source voltage.

V_z = diod voltage.

$$V\ out = Vin*(R_L / R_L + R_s)$$

As: $V\ out = V_z$

$$V_z = Vin*(R_L / R_L + R_s)$$

$$V_{in}R_L - V_zR_L = R_sV_z$$

$$R_L = V_z*R_s / (V_{in} - V_z)$$

Putting values

V_{in}=20V, V_z=12V and R_L=1000.

$$R_L = 12*1000 / (20- 12)$$

$$\mathbf{R_L = 1500}$$

Now, find Rs efficient value,

$$V_z = Vin*(R_L / R_L + R_s)$$

$$V_{in}R_L - V_zR_L = R_sV_z$$

$$R_s= V_{in}R_L - V_zR_L / V_z$$

Putting values R_L=1000

$$R_s= 20*1000 – 12*1000 / 12$$

$$\mathbf{R_s= 666.6}$$

I find threshold value of R_L for more efficiency, so that less current will dissipate through Zener diode.

R_L threshold level circuit: -