BASIC ELECTRONICS LAB TASK # 07

Name: Shahmeer Khan.

Student ID: 12113.

Class ID: 106293.

Topic: Power Heat Application.

TASK:

OBSERVATIONS/CALCULATIONS:

Objectives:

A, Determine that a parallel circuit has more than one path for current to flow using an ammeter and miniature lamps.

B, Measure the voltage drops in a series circuit using a voltmeter.

Objective A:

Determine that a parallel circuit has more than one path for current flow, using an ammeter and miniature lamps.

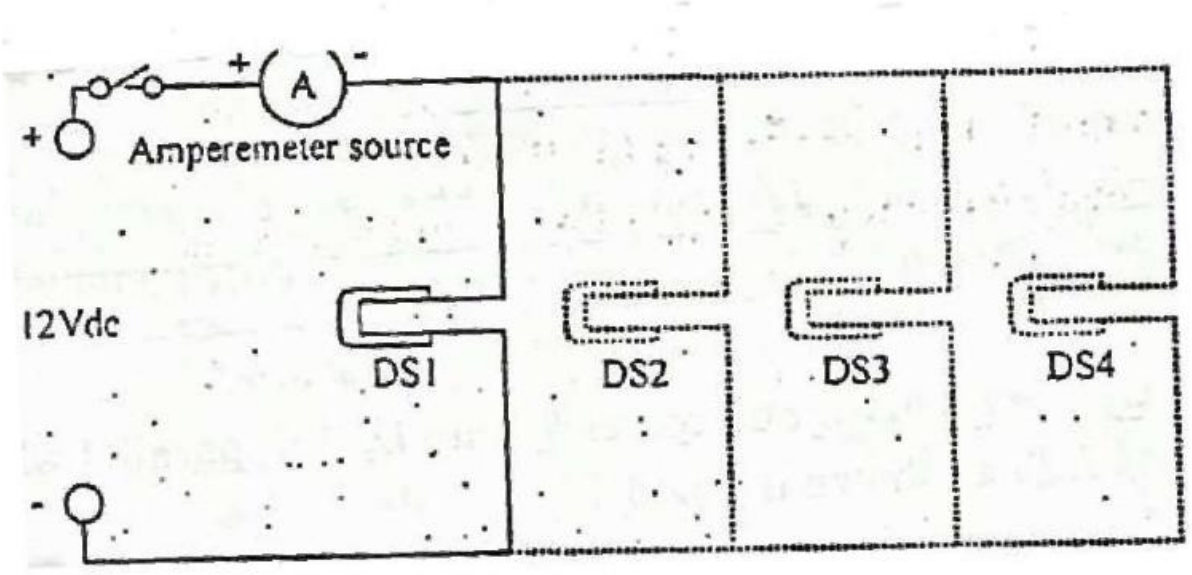
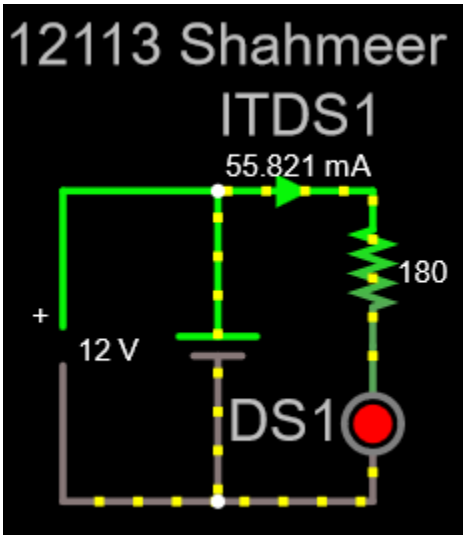


Fig-1

- Connect the lamp DS1 in series with the ammeter across dc power source as shown in Fig-1.



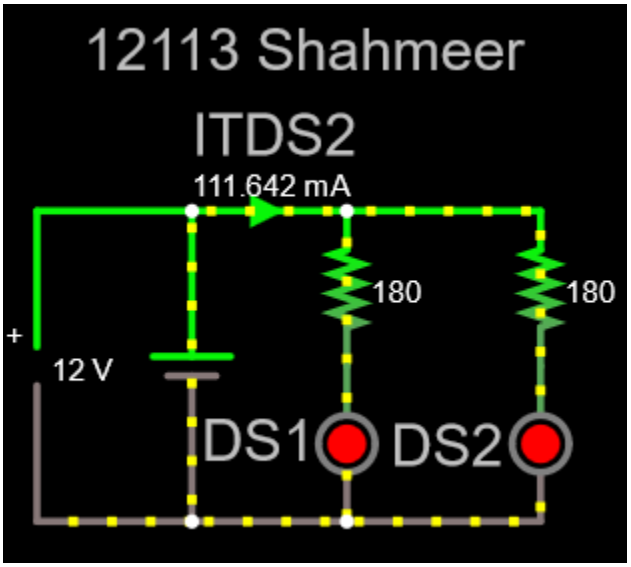
- Adjust the power source to 12Vdc and note the brightness of lamp DS1.

  Answer: Done.

- Measure the total circuit current.

I_T= **55.821** mA DC.

- Return the voltage to zero and connect lamp DS2 in parallel with DS1 as shown in Fig.

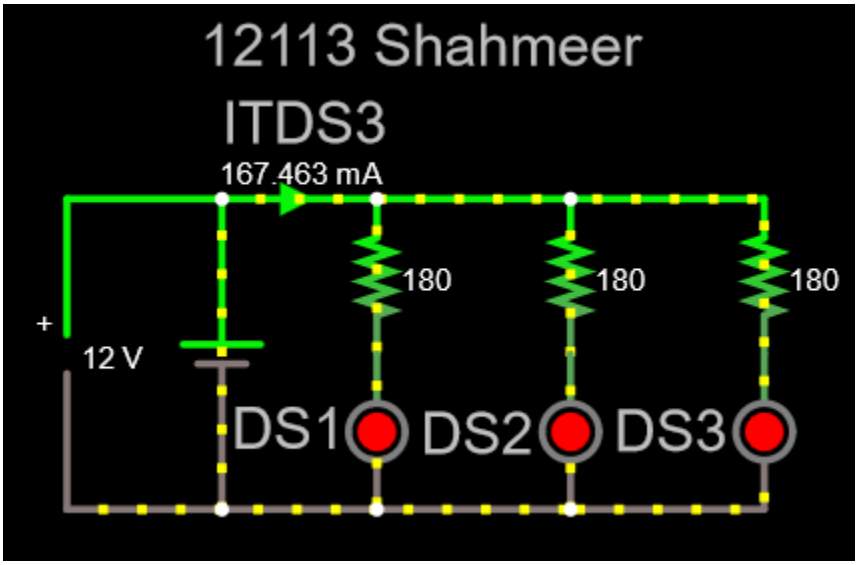


- Adjust the voltage again to 12Vdc and note the brightness of both lamp DS1 and DS2.

  Answer: Done.
- Is there any change in brightness?

  Answer: No.
- Measure the total circuit current.

  I_T= **111.642** mA DC.
- Return the voltage to zero and connect DS3 in parallel as shown in Fig. Adjust power source back to 12Vdc.

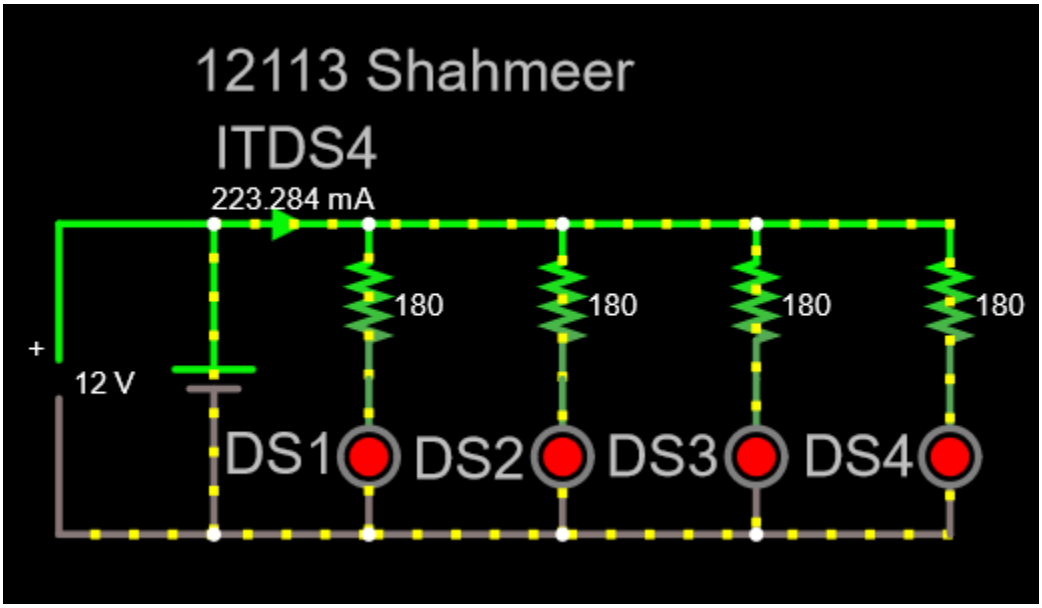


- Is there any change in Brightness?

  Answer: No.
- Measure the total circuit current.

  I_T= **167.463** mA DC.

- Return the voltage to zero and connect DS4 in parallel as shown in Fig. Adjust power source back to 12Vdc.



- Is there any change in Brightness?

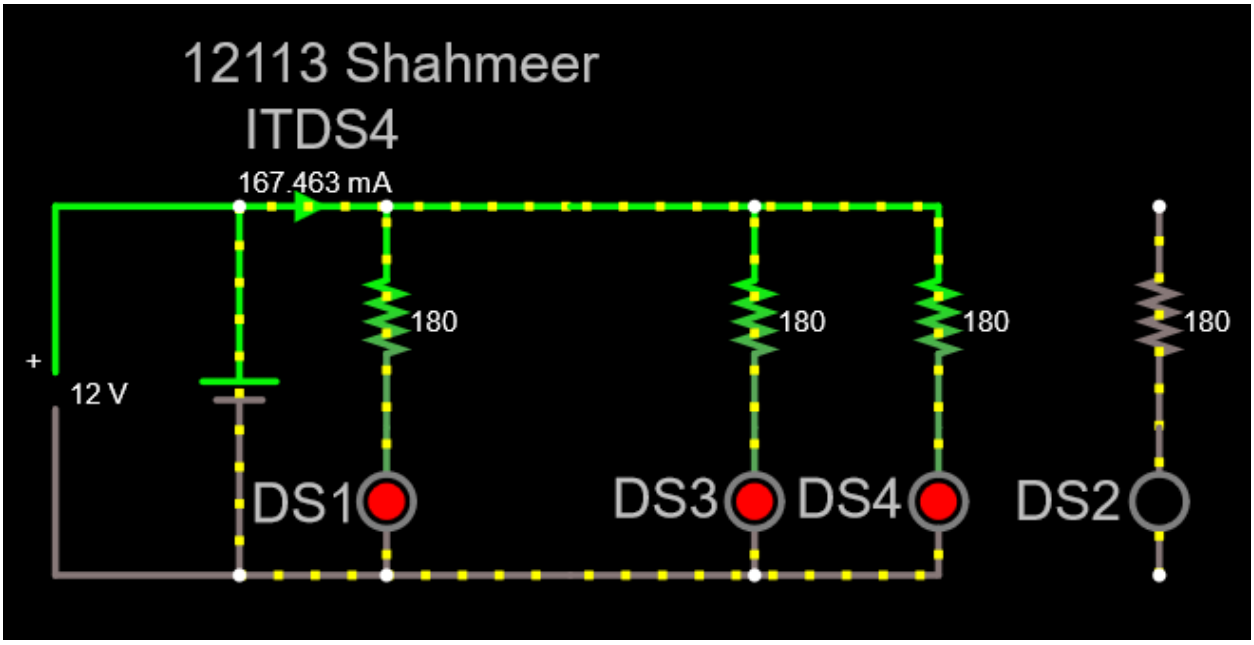
  Answer: No.

- Measure the total circuit current.

  I_T= **223.284** mA DC.

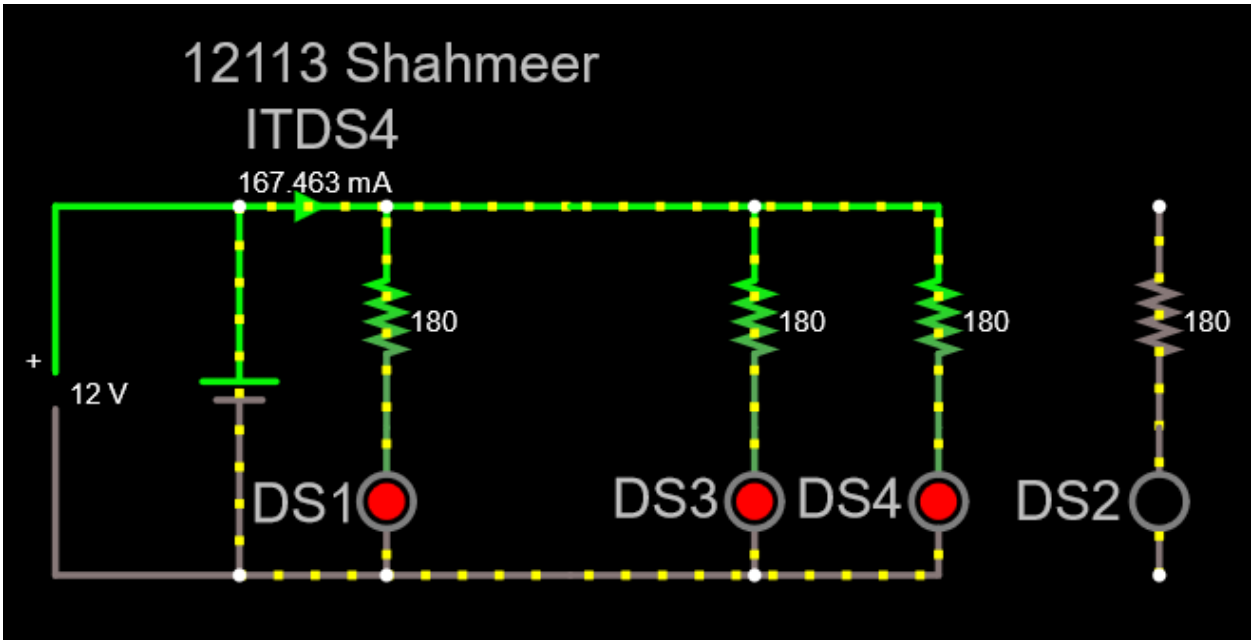
- Remove Lamp DS2 from its socket. Do other lamps remain lighted?

  Answer: Yes the other lamps are glowing.

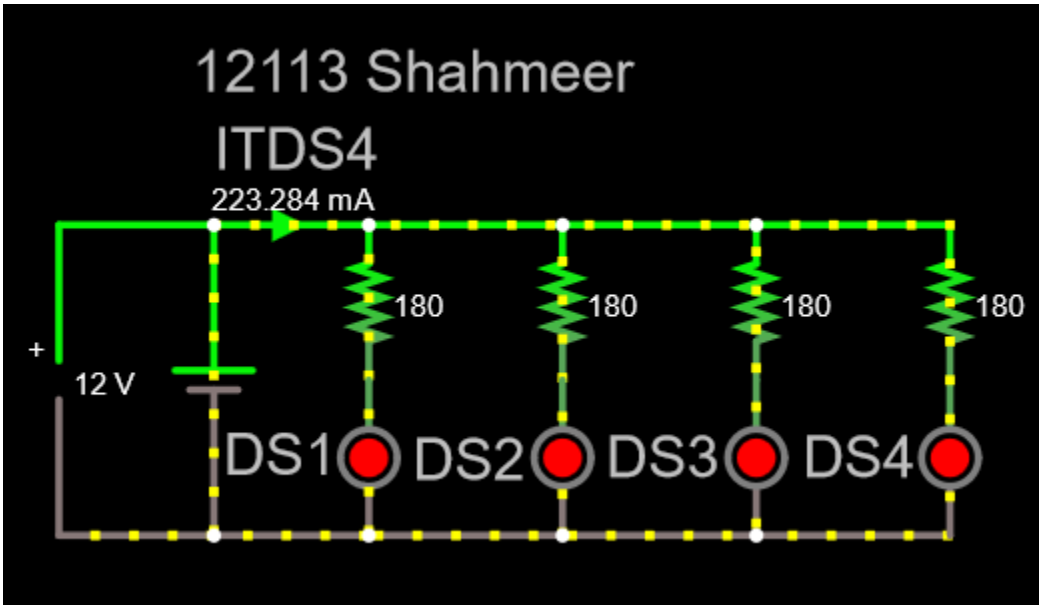


- Is there any change in their brightness?

  Answer: No.



- Is the total current remain same?
  Answer: No it got changed into a new value which is now is 167.463.
- Replace lamp DS2 in its socket.
  Answer: Done.



- Return the voltage to zero.
  Answer: Done.
- The total current (increased, decreased) each time a lamp is added to the circuit. Therefore the total circuit resistance (increased, decreased).
  Answer:
  * Current will get increased each time a lamp is added to the circuit.
  * And therefore the total circuit Resistance will be decreased.

Link of the simulator file:

https://tinyurl.com/yaz8csua

Objective B:

Measure the voltage drops in a series circuit using a voltmeter.

- Connect the lamp DS1, in series with the ammeter across the power source as shown in Fig-2.

  Answer: Done.

- Set the ammeter to 1Adc range.

  Answer: Done.

- Adjust the power source to 5Vdc and observe the brightness of Lamp DS1.

  Answer: Done.

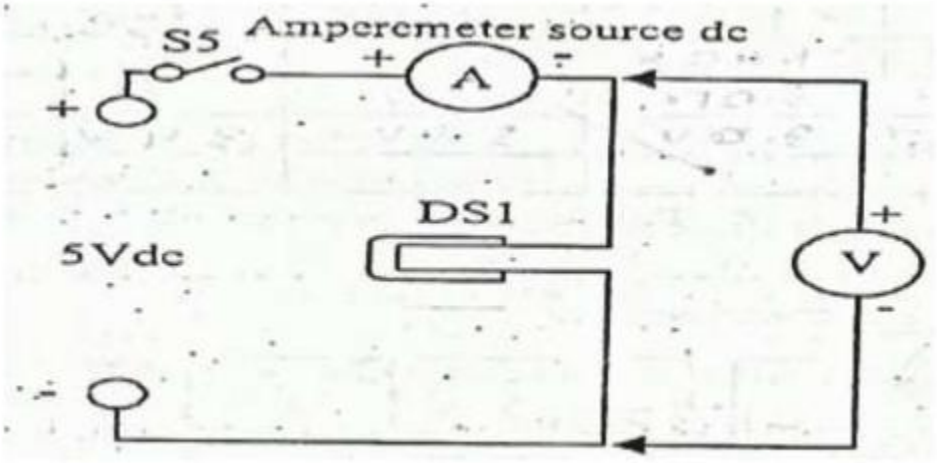


Fig-2.

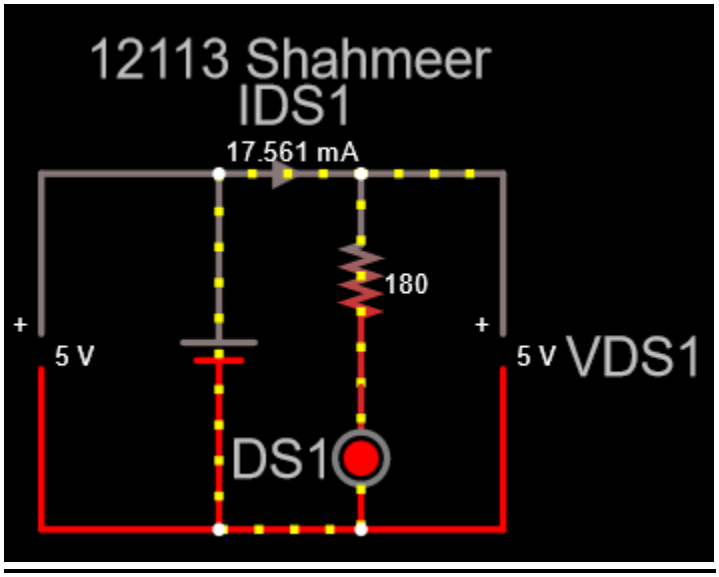
- Measure the current through lamp DS1.

I_{DS1}= 17.561 mA DC.

- Use voltmeter to measure the voltage drop across lamp DS1 as shown in fig above. The voltage measured across the lamp DS1 is also called the voltage drop across lamp DS1.

V_{DS1}= 5 VDC.

Screenshot:



- Enter the circuit current, I and the voltage across lamp DS1 in Table3.

  Answer: Done.
- Return the voltage to zero.

  Answer: Done.

Lamps in Series	I mA DC	Lamp Volts			
		DS1	DS2	DS3	DS4
1	17.561	5	x	x	x
2	X	x	X	x	x
3	X	X	X	X	x
4	x	X	X	X	X

- Connect the lamp DS2 into the circuit in series with the lamp DS1 as shown in Fig-3.

Table-3

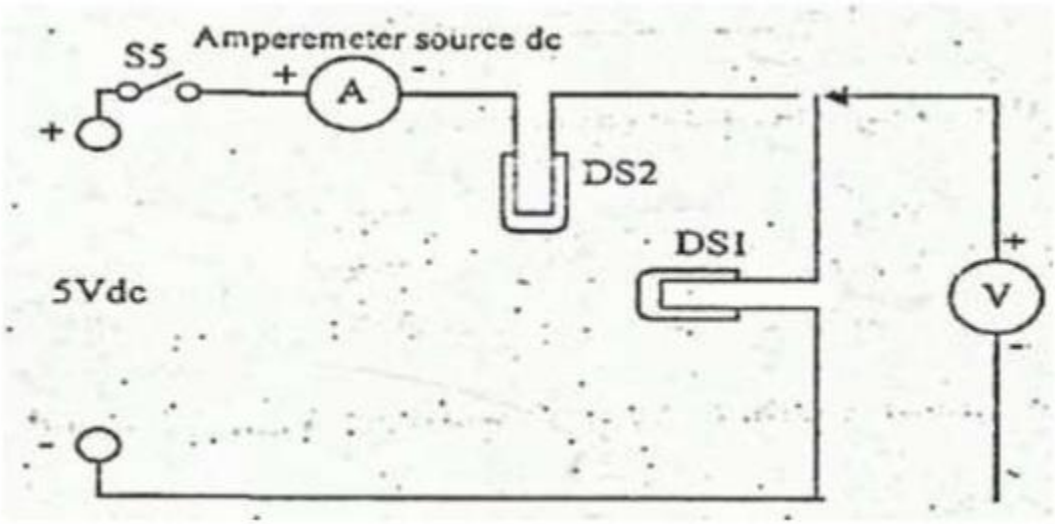


Fig-3.

- Adjust the power source to 5Vdc and note the brightness of lamps DS1 and DS2.
- Measure the current flowing through the circuit.

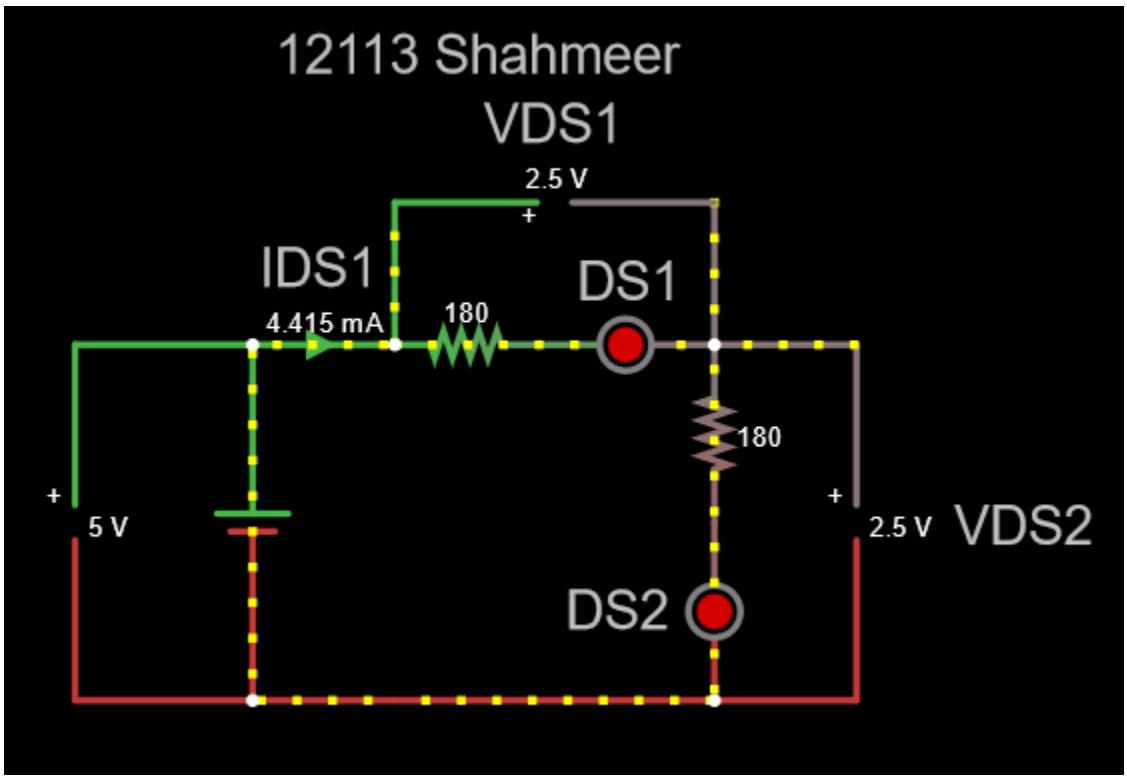
I_{DS1}= 4.415 mA DC.

- Now measure the voltages across each of the lamps.

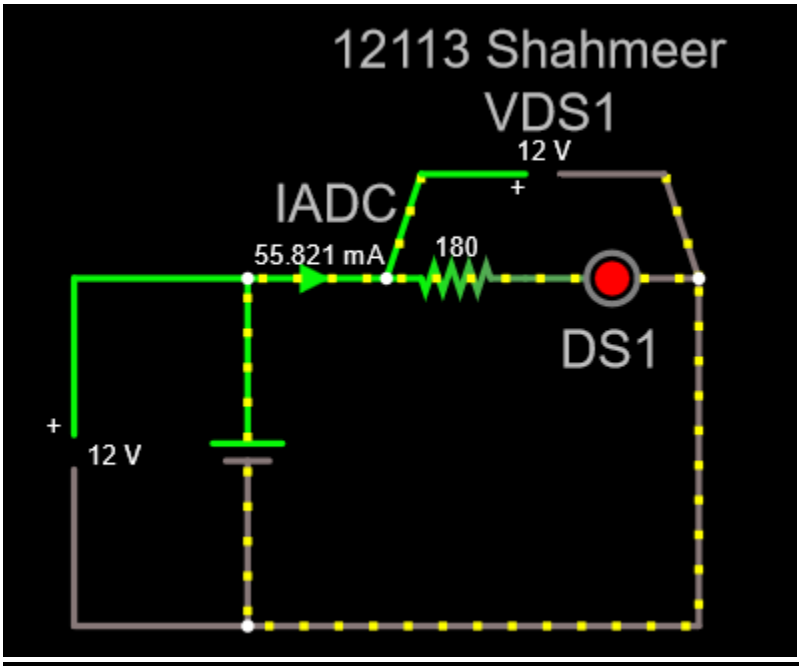
V_{DS1}= 2.5 VDC.

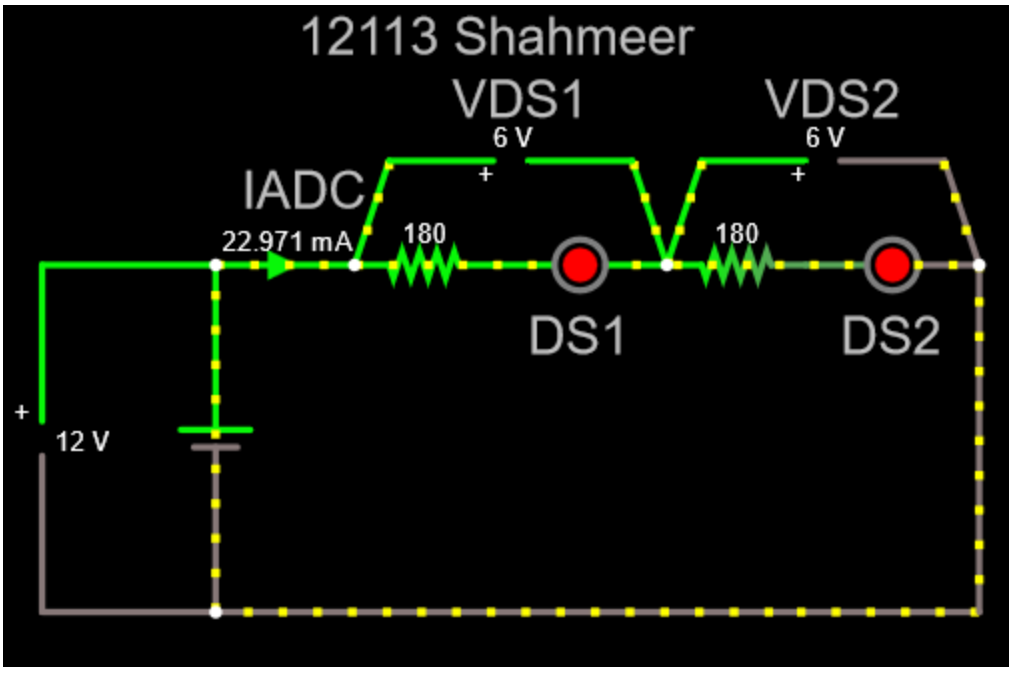
V_{DS2}= 2.5 VDC.

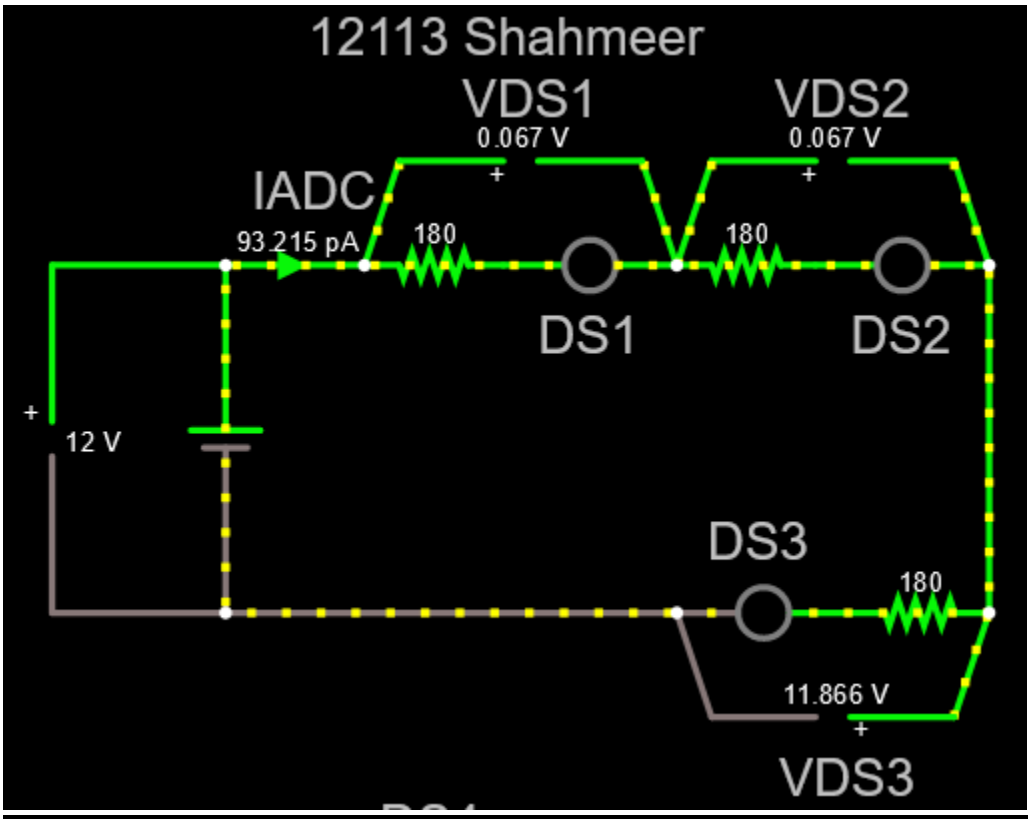
Screenshot:

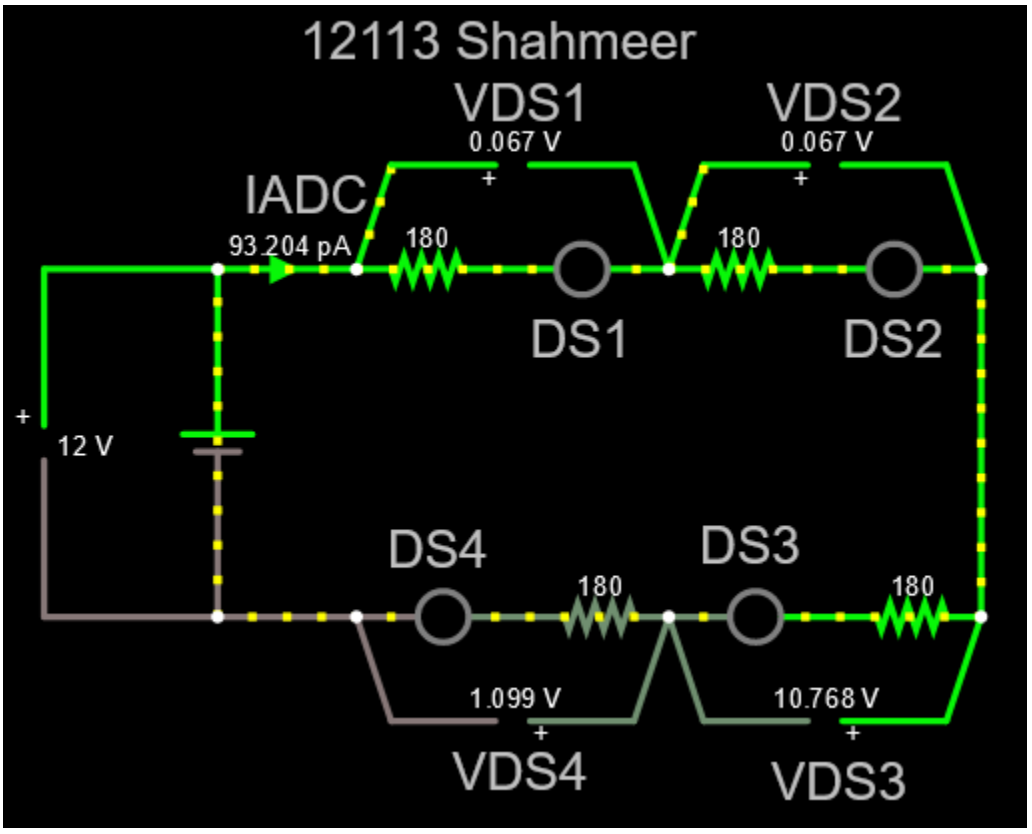


Further Sir's Activity Screenshots:




12113 Shahmeer
VDS1
6 V
VDS2
6 V
IADC
22.971 mA
180
180
DS1
DS2
+
12 V


12113 Shahmeer
VDS1
0.067 V
VDS2
0.067 V
IADC
93.215 pA
180
180
DS1
DS2
+
12 V
DS3
180
11.866 V
VDS3


12113 Shahmeer
VDS1
0.067 V
+
VDS2
0.067 V
+
IADC
93.204 pA
180
180
DS1
DS2
+
12 V
DS4
DS3
180
180
1.099 V
+
10.768 V
+
VDS4
VDS3

Lamps in Series	I mA DC	Lamp Volts (V)			
		DS1	DS2	DS3	DS4
1	55.821	12	x	x	x
2	22.971	6	6	x	x
3	93.215 (pA)	0.067	0.067	11.866	x
4	93.204 (pA)	0.067	0.067	10.768	1.099

Link of the simulator file:

https://tinyurl.com/y7a8yvk7