Skills Compétences Canada

Ohms Law Circuit Building and Testing

# Outdoor Power and Recreation

SECONDARY

Competitor Names: _____Province/Territory___

# Ohm's Law Trainer

Do not start this lab until told that the competition is ready to start.
**If there is something you don't understand, you may ask for clarification from the person in charge.**
If you have completed this lab early, please check your answers and wait quietly until everyone has finished or all the time is used.

**Source voltage MUST be set to 14.5 VDC.**

## LIGHT BULB CIRCUITS WITH PROBLEMS

This lab challenges your knowledge of the operation of combination circuits and lighting circuits with problems. Use the answer sheet to record all your measurements and question answers.

**1. Wire L1 and L2 NORMALLY to observe it normal condition:**

CONNECT **RED** JUMPER WIRES BETWEEN:

A. Any of the red positive receptacles to terminal O of SW1
B. Terminal I of SW1 to terminal A of L1
C. Terminal I of SW1 to terminal C of L2

CONNECT **BLACK** JUMPER WIRES BETWEEN:

D. Terminal B of L1 to any of the black ground receptacles.
E. Terminal D of L2 to any of the black ground receptacles.

**2. Judges Check – Observe the intensity of the 2 lamps.**

**3. Now, remove all wires and rewire the board as follows:**

CONNECT **RED** JUMPER WIRES BETWEEN:

A. Any of the red positive receptacles to terminal O of SW1.
B. Terminal I of SW1 to terminal M of R2.
C. Terminal L of R2 to terminal A of L1
D. Second wire from terminal I of SW 1 to terminal C of L2

CONNECT **BLACK** JUMPER WIRES BETWEEN:

E. Terminal B of bulb L1 to any of the black ground receptacles.
F. Terminal D of L2 to terminal R of R5
G. Terminal S of R5 to any of the black ground receptacles.

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**4. Judges Check**

**5.** Draw the circuit you have just constructed on a blank template (located on the last page) and label it: **LIGHT BULB CIRCUIT WITH PROBLEM.**

**6.** What is the description of each bulb's performance?

A. _____ Bulb L1's condition.
B. _____ Bulb L2's condition.

**7.** A. _____ Available voltage at bulb L1.
B. _____ Available voltage at bulb L2.

**8.** Voltage drop testing of bulbs L1 and L2:
A. _____ Voltage drop across bulb L1 **positive circuit (not L1).**
B. _____ Voltage drop across bulb L1 **ground circuit**.
C. _____ Voltage drop across bulb L2 **positive circuit (not L2).**
D. _____ Voltage drop across bulb L2 **ground circuit.**

**9.** Compared to the expected voltage drops in a **normally** functioning circuit, indicate below if your readings taken in Q#8 are NORMAL or ABNORMAL.
Measurement A (NORMAL or ABNORMAL).
Measurement B (NORMAL or ABNORMAL).
Measurement C (NORMAL or ABNORMAL).
Measurement D (NORMAL or ABNORMAL).

**10.** A._____ Available voltage at L1 A terminal with bulb removed.
B._____ Available voltage at L1 A terminal with bulb installed.

**11.**_____Voltage drop across L1

**12.**_____Voltage drop across L2

**13.**_____Current flow in L1 circuit

**14.**_____Current flow in L2 circuit

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**15.** CALCULATED RESISTANCE of L1 circuit showing your work:

_____

**16.** CALCULATED RESISTANCE of L2 circuit showing your work:

_____

**17.** Actual resistance of R2 _____

**18.** Actual resistance of R5 _____

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- **SCHEMATIC/DRAWING**