LDR and NTC characteristic graphs

AIM

Measure how the resistance of an LDR changes with light, and of an NTC thermistor with temperature. Use each sensor in a voltage divider and record V_{out}.

YOU NEED

- ☐ LDR and 10 kΩ NTC thermistor (sealed in a heat-shrink sleeve)
- ☐ 10 kΩ resistor, breadboard, 5 V supply
- ☐ Digital multimeter (Ω and V ranges)
- ☐ Light meter or phone light-meter app; desk lamp
- ☐ Beaker, kettle water, ice, thermometer

SHORT CIRCUIT

× WHAT EXAMINERS SAW

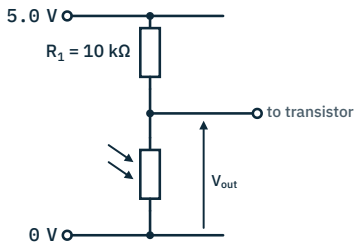
Hot water near electronics: wet leads can short, and water above 60 °C can scald.

✓ THE FIX

Use the sealed thermistor. Keep the breadboard away from the beaker. Your teacher pours the hot water.

Safety

Part A · LDR



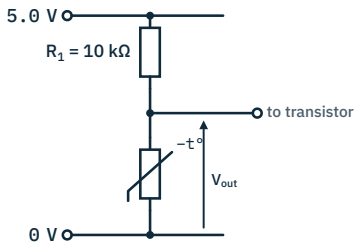
LDR divider

1. Measure the LDR's resistance on the Ω range at each light level. Use the light meter to set the level by moving the lamp.
2. Build the divider. Measure V_{out} at each light level.
3. Before you measure, predict whether R goes up or down, and estimate V_{out}.

Light	Predicted R (↑ / ↓)	Measured R (kΩ)	Predicted V_{out} (V)	Measured V_{out} (V)
10 lux				
50 lux				
100 lux				
200 lux				
500 lux				

LDR and NTC characteristic graphs

Part B · NTC thermistor



Thermistor divider

1. Put the sealed thermistor and thermometer in the beaker. Start with warm water and add ice to cool it.
2. At each temperature, measure R, then V_{out}.
3. Stir and wait 30 seconds before each reading.

Temperature	Predicted R (↑ / ↓)	Measured R (kΩ)	Predicted V_{out} (V)	Measured V_{out} (V)
10 °C				
20 °C				
30 °C				
40 °C				
50 °C				
60 °C				

Graphs

Plot resistance (kΩ) against light level, and resistance against temperature. Label both axes with the quantity and unit. Draw a smooth curve.

LDR and NTC characteristic graphs

Evaluate

EVALUATION FRAME

The aim was to _____. My results show that as the _____ increased, the resistance _____.

This means V_{out} _____ because _____.

One source of error was _____, which caused _____. To improve the test I would _____.

Not for use during the assignment