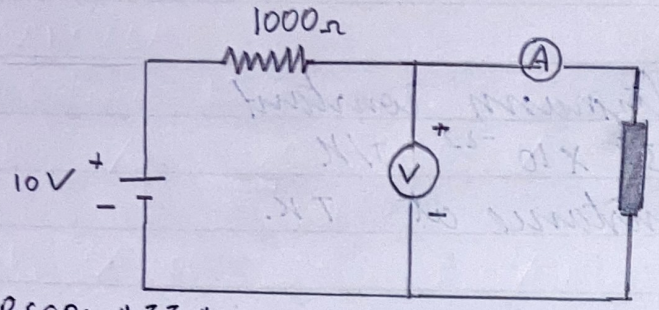
Experiment

Name .....



Circuit Diagram.

OBSERVATION →

To determine the resistance of LDR at diff. distance

Sr.No.	Distance (cm)	Voltmeter Reading (V)	Ammeter Reading (A)	R_R (kΩ)
1	15 cm	1	4×10^{-3} A	0.250 kΩ
2	15 cm	2	6×10^{-3} A	0.333 kΩ
3	15 cm	3	10×10^{-3} A	0.300 kΩ
4	15 cm	4	12×10^{-3} A	0.333 kΩ
5	15 cm	5	14×10^{-7} A	0.357 kΩ
			Mean R_R =	0.314 kΩ
1	10 cm	1	8×10^{-3} A	0.125 kΩ
2	10 cm	2	12×10^{-3} A	0.166 kΩ
3	10 cm	3	16×10^{-3} A	0.187 kΩ
4	10 cm	4	20×10^{-3} A	0.200 kΩ
5	10 cm	5	24×10^{-3} A	0.208 kΩ
			Mean R_R =	0.177 kΩ
1	5 cm	1	10×10^{-3} A	0.100 kΩ
2	5 cm	2	14×10^{-3} A	0.142 kΩ
3	5 cm	3	18×10^{-3} A	0.166 kΩ
4	5 cm	4	23×10^{-3} A	0.173 kΩ
5	5 cm	5	28×10^{-3} A	0.178 kΩ
			Mean R_R =	0.151 kΩ

Teacher's Signature .....

Date 23/10/2020

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V-I CHARACTERISTICS OF A LIGHT DEPENDENT RESISTOR (LDR)

Aim:

To measure the photoconductive nature and the dark resistance of the given light dependent resistor (LDR) and to plot the characteristics of the LDR

Apparatus Required:

LDR, Resistor (1 KΩ), ammeter (0-10 mA), voltmeter (0-10V), light source, regulated power supply.

Formula →

By Ohm's Law, $V = IR$ or $R = \frac{V}{I}$ ohm.

where, R is the resistance of the LDR (i.e) the resistance when the LDR is closed.

V & I represents the corresponding voltage and current respectively.

Teacher's Signature .....

Experiment

Name .....

CALCULATIONS → (Using $R = \frac{V}{I}\Omega$).

For Distance = 15cm

(i) $R_1 = 1/0.004 = 250\Omega$ or $0.250k\Omega$

(ii) $R_2 = 2/0.006 = 333\Omega$ or $0.333k\Omega$

(iii) $R_3 = 3/0.01 = 300\Omega$ or $0.30k\Omega$

(iv) $R_4 = 4/0.012 = 333\Omega$ or $0.333k\Omega$

(v) $R_5 = 5/0.014 = 352\Omega$ or $0.357k\Omega$

$Mean_A = \frac{250+333+300+333+357}{5}$

$= 314\Omega$ or $0.314k\Omega$

For Distance = 10cm

(i) $R_1 = 1/0.008 = 125\Omega$ or $0.125k\Omega$

(ii) $R_2 = 2/0.012 = 166\Omega$ or $0.166k\Omega$

(iii) $R_3 = 3/0.016 = 187\Omega$ or $0.187k\Omega$

(iv) $R_4 = 4/0.020 = 200\Omega$ or $0.200k\Omega$

(v) $R_5 = 5/0.024 = 208\Omega$ or $0.208k\Omega$

$Mean_B = \frac{125+166+187+200+208}{5}$

$= 172\Omega$ or $0.177k\Omega$

For Distance = 5cm

(i) $R_1 = 1/0.010 = 100\Omega$ or $0.1k\Omega$

(ii) $R_2 = 2/0.014 = 142\Omega$ or $0.142k\Omega$

(iii) $R_3 = 3/0.018 = 166\Omega$ or $0.166k\Omega$

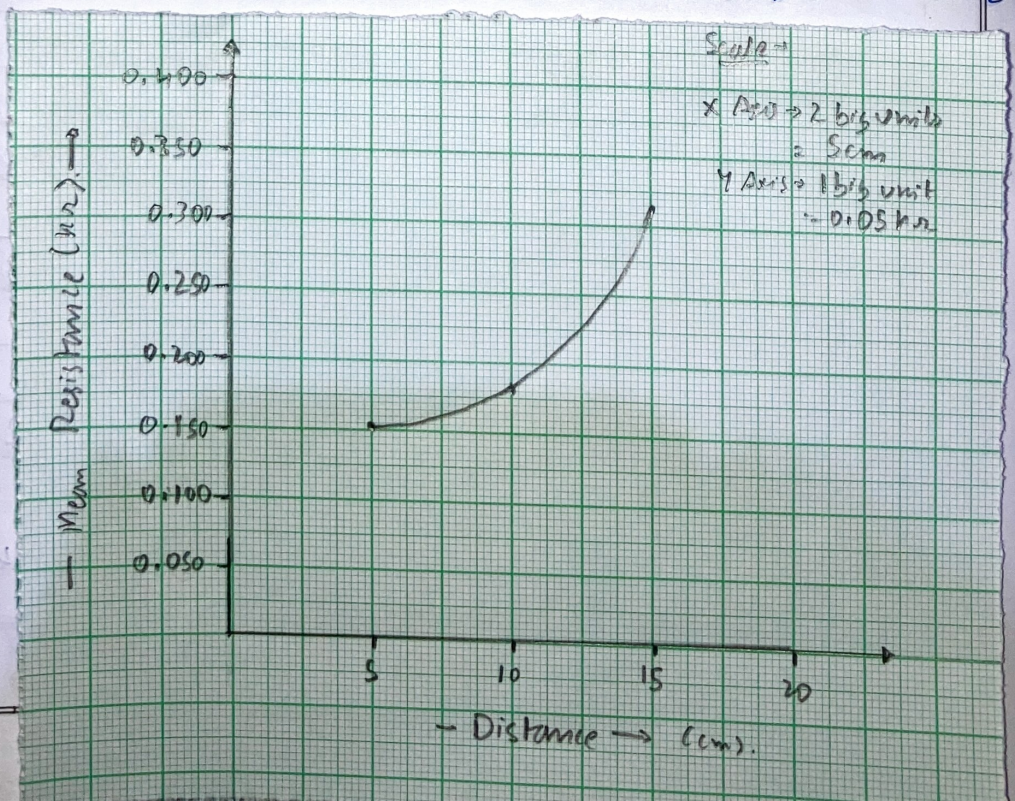
(iv) $R_4 = 4/0.023 = 173\Omega$ or $0.173k\Omega$

(v) $R_5 = 5/0.028 = 178\Omega$ or $0.178k\Omega$

$Mean_C = \frac{100+142+166+173+178}{5}$

$= 151\Omega$ or $0.151k\Omega$

Model Graph →



Date 23/10/20

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Principle:

The photoconductive device is based on the decrease in the resistance of certain semiconductor materials when they are exposed to both infrared & visible radiation.

The photoconductivity is the result of carrier excitation due to light absorption and the figure of merit depends on the light absorption efficiency. The increase in conductivity is due to an increase in the number of mobile charge carriers in the material.

RESULT →

(i) The characteristics of LDR were studied and plotted.

(ii). The dark resistance of the given LDR = 0.357 MΩ.

Teacher's Signature .....