



DEPARTMENT OF PHYSICS
MAR THOMA COLLEGE FOR WOMEN, PERUMBAVOOR

CHARACTERISTICS OF LIGHT DEPEND RESISTORS

An LDR (Light Dependent Resistor), also known as a photoresistor, is a passive electronic component that exhibits changes in its electrical resistance in response to varying levels of light. LDRs are designed to be highly sensitive to light. They can detect and respond to changes in light intensity across a wide range, from low light levels to bright illumination.

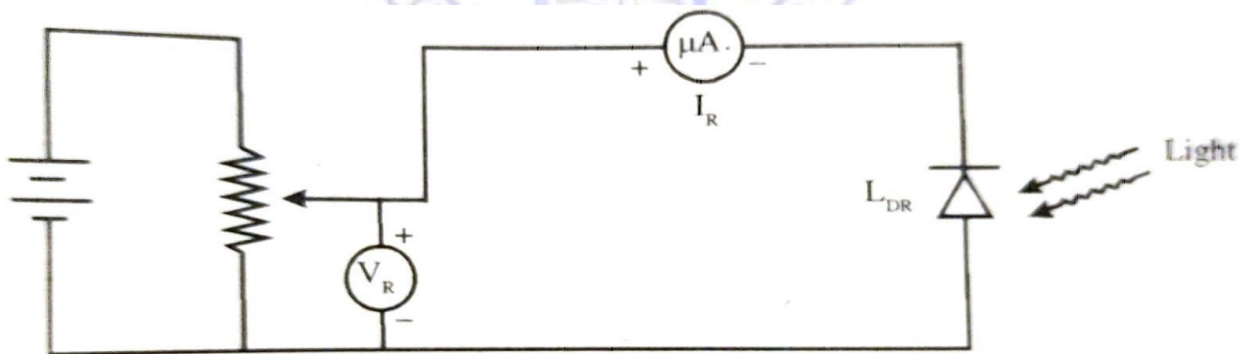
Aim

To study the characteristics of light depend resistor (LDR).

An LDR, a dc variable source, a rheostat, a voltmeter, a micro ammeter, wooden scale etc.

Theory

When a diode is reverse biased, the reverse saturation current is constituted by minority carriers. These minority carriers are produced (due to thermal energy that dislodges for release) the valence electrons from their orbits, thereby producing free electrons and holes. If the energy is provided to a p-n junction by light (of suitable wavelength), it can also produce electron - hole pairs the same way.



Connection diagram



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Stronger the intensity of light falling, more will be the number of charge carriers and hence larger will be the reverse current. The amount of light striking the p-n junction controls the reverse current. This current is of the order of few micro amperes.

Procedure

Make the connections as shown in figure below. Place a filament lamp at a distance d (about 100cm) from the LDR. With the lamp off, vary the reverse voltage V_R 0 to 5V and observe the corresponding values of current (dark current if any dark current is the reverse saturation current reaching the junction corresponding to zero light. Now switch on the lamp. Keep distance d fixed, vary V , from 0V to 5V and note the corresponding values of photo current I_R through the diode. Finally draw the characteristic curve.

Observations and tabulations

Dark current

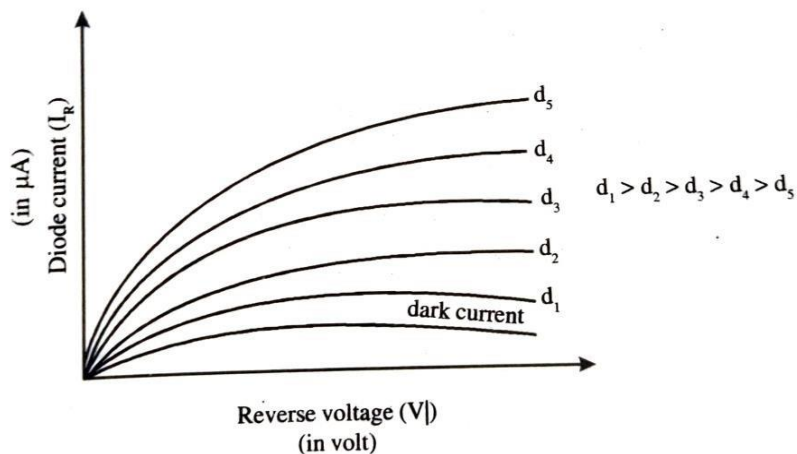
Trial No	V_R (Volts)	I_R (μA)
1		
2		
3		
4		

Trial No	d = cm		d = cm		d = cm		d = cm		d = cm	
	V_R (Volts)	I_R (μA)	V_R (Volts)	I_R (μA)	V_R (Volts)	I_R (μA)	V_R (Volts)	I_R (μA)	V_R (Volts)	I_R (μA)
1										
2										
3										
4										
5										
⋮										
⋮										
⋮										



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$V_R - I_R$ characteristics



Result

The voltage current characteristics of LDR have been studied

References

- Experimental Physics – II, For Fifth & Sixth Semester, BSc Degree Programme, Dr.P. Sethumadhavan, Prof. K.C. Abraham, Prof. Meppayil Narayanan, Prof. Philipson C Philip, **Manjusha Publications**
- <https://youtu.be/luqdjUSzf-Y?si=4n-TaDSelcUYFwQW>



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