



**Faculty of Natural and Applied Sciences
Department of Physics**

**PHY 108
Electricity and Magnetism Lab
Experiment 3: Characteristic curves of a solar cell**

Student Name:

Student ID:

Department:

Date of Experiment:

Group:

OBJECTIVES:

- a. To plot the current-voltage characteristic at different light intensities.
- b. To plot the current-voltage characteristic under different operating conditions: cooling the equipment with a blower, no cooling.

THEORETICAL BACKGROUND

The current-voltage characteristics of a solar cell are measured at different light intensities, the distance between the light source and the solar cell being varied.

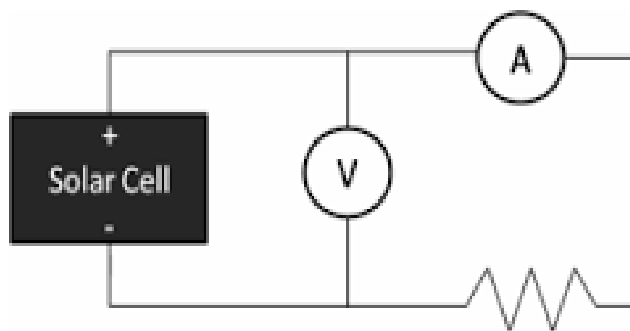
The solar cell measures the diffused light as well as the direct light from the lamp. As the lamp has a slim light cone of approx. 30° , the diffused light chiefly arises as a result of reflection from the bench top and can be suppressed by covering the bench with a black cloth or piece of black card.

SETUP AND PROCEDURE

Circuit for measuring the current-voltage characteristic.



- Connect the setup of the experiment as shown above.
- Set the solar cells at positions 200mm, 400mm, 600mm and 800mm from the light source.
- By varying the value of the external resistance using the rheostat at each position, read and record the current and voltage to obtain Current-voltage characteristic at different light intensities.
- Read and record the current and corresponding voltage at every point of 200, 400, 600 and 800
- Connect the mechanical resistance (blower) and repeat the procedure from 2 to 4.
- Plot the graphs of all the voltages V against the currents I for the observation without blower and that with blower and determine the I_{\max} for the two graphs.

**DATA****Task 1**

Tabulate your readings as shown below

a) For the solar cells at 200mm to the light source

	Solar cells at 200mm to Light		Solar cells at 400mm to Light		Solar cells at 600mm to Light		Solar cells at 800mm to Light	
S/N	I (A)	V (V)	I (A)	V (V)	I (A)	V (V)	I (A)	V (V)
1								
2								
3								
4								
5								
6								
7								

Task 2 Install the air blower, place it close to the solar cell and repeat the experiment in task 1.

Tabulate your readings as shown below

S/N	Solar cells at 200mm to Light		Solar cells at 400mm to Light		Solar cells at 600mm to Light		Solar cells at 800mm to Light	
	I (A)	V (V)	I (A)	V (V)	I (A)	V (V)	I (A)	V (V)
1								
2								
3								
4								
5								
6								
7								

Instructor signature and Date_____

TITLE:

SCALE:

[illegible]

TITLE:

SCALE:

This image shows a full page of blank graph paper. The background is a solid light blue color. Overlaid on this background is a uniform grid of thin red lines. The grid consists of small squares that cover the entire area of the page, leaving no margins or other markings. There are no numbers, letters, or symbols present on the paper.

CALCULATIONS

- (a) What is the value of current in a circuit of resistance $15\ \Omega$ and potential difference of 3.0V applied across its ends?
- (b) What is the resistance ratio of two bulbs of 100W and 50W at 250V ?

DISCUSSION OF RESULTS**PRECAUTIONS**