Assignment 11-Experiment-11

DETERMINATION OF EFFICIENCY OF A SOLAR CELL

Aim

       To determine the efficiency of solar cell.

Apparatus Required

    Solar cell, voltmeter, milliammeter, a dial type resistance box, Keys, illuminating lamps, connecting wires etc.

FORMULAE

Efficiency of solar cell $\eta = [P_{max}/AI_o] \times 100$

P_{max} = Maximum power = $I_{MP} \times V_{MP}$ Watt

A-Area of the solar panel [7.2 cm x 4.5 cm]

I_o Intensity of light = Power of the bulb$/4\pi d^2$
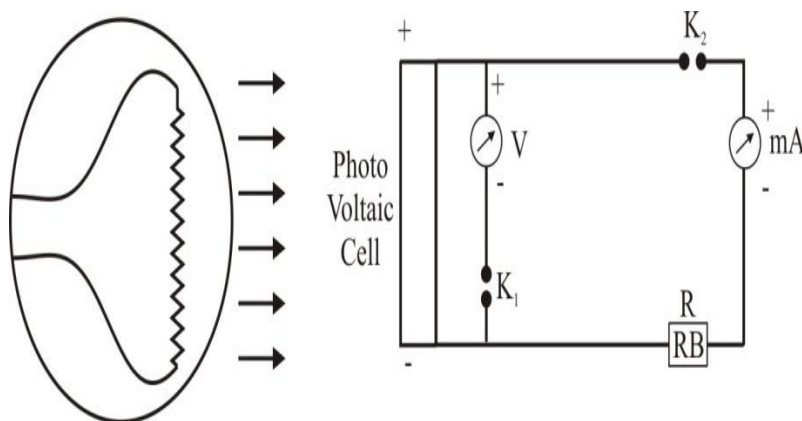
d - Distance between solar panel and bulb

Fig.8.1 Schematic representation and circuit of Solar Cell

(i)   Table V-I and V-R characteristics

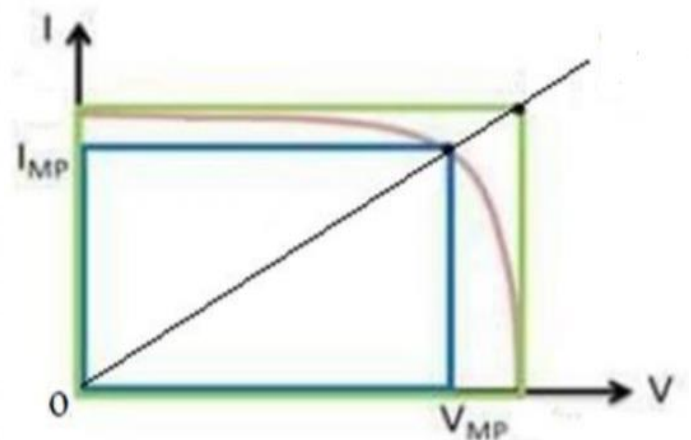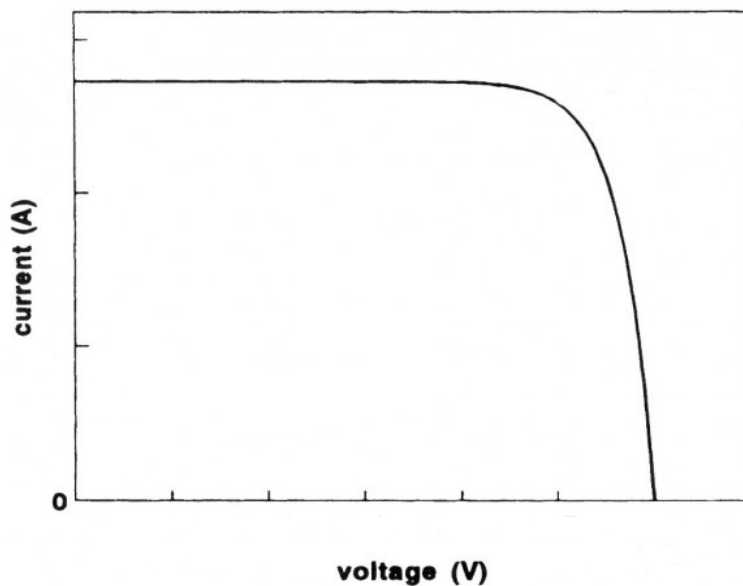| Intensity	Resistance (Ohm)	Voltmeter Reading (V)	Ammeter Reading (I) (mA)
Maximum	10	1.57	122.6
	22	2.83	122.1
	47	3.62	74.1
	56	3.63	63.3
	68	3.84	55.2
	82	3.9	45.5
	100	3.93	36.2
	160	3.94	26.2
	180	3.96	21.6

Fig. Model Graph for V-I Characteristic

Observation:

Power of the bulb = 75 Watt
Distance between solar panel and bulb is = 10 cm
Maximum Power P$_{Max}$ = …………………..
Intensity of Light Io = ……………………..
Area of the Solar Panel = …………………

Assignment Question:

1. By using the readings in the tabular coloum (V and I), to draw V-I characteristic curve for Maximum Intensity.

2. From the graph find out the Maximum power (P_{Max}).

3. By using the power of bulb and distance between the panel and bulb, calculate the Intensity of Light. Also find out the area of the solar panel by using the dimensions of solar panel.

4. Finally calculate the efficiency of the solar cell by using the values of Maximum power, Intensity of light and Area of the panel.

5. Write the result in the following order

   The efficiency of the solar panel is ή =………….

Finally, submit the scanned copy of your observation note book in GCR on (or) before THREE working days from the date of experiment.