

Date:Reg. No.**CLEAN ENERGY****Apparatus Required:**

- Solar cell (*p-n* junction diode)
- Light source (100 W bulb)
- Ammeter
- Voltmeter
- Load circuit
- Connecting wires

**SLO:**

- To draw the I-V characteristics of a solar cell and to find out its efficiency and fill factor

The maximum power generated:  $P_{\max} = V_{mp} I_{mp}$  (where  $V_{mp}$  and  $I_{mp}$  are the current and voltage values corresponding to maximum power).

$$FF = \frac{V_{mp} I_{mp}}{V_{oc} I_{sc}}$$

$$\eta = \frac{P_{\max}}{A_c \Omega} \quad (\text{where, } A_c - \text{Area of the solar cell, } \Omega - \text{Incident intensity})$$

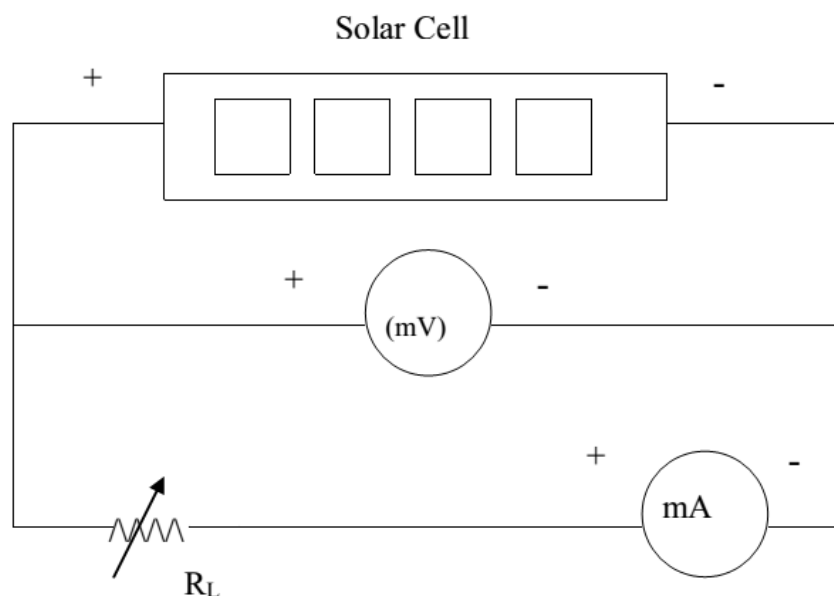


Figure 1: Study of I-V characteristics of a solar cell

Date:Reg. No.**Table: (I-V Characteristics)** $I_{SC} = \underline{\hspace{2cm}}$ ,  $V_{OC} = \underline{\hspace{2cm}}$ 

Load Resistance ( )	Distance (x) = _____ Intensity of light = _____		
	Current ( )	Voltage ( )	Power ( )

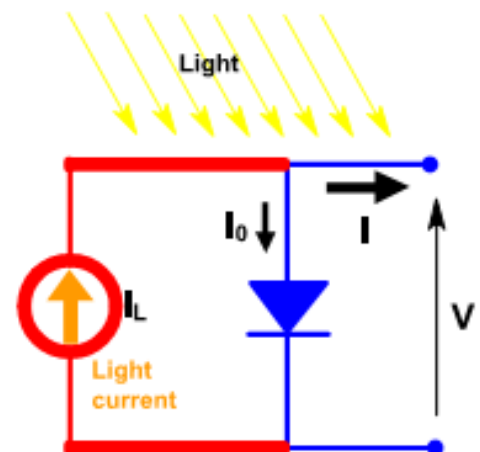
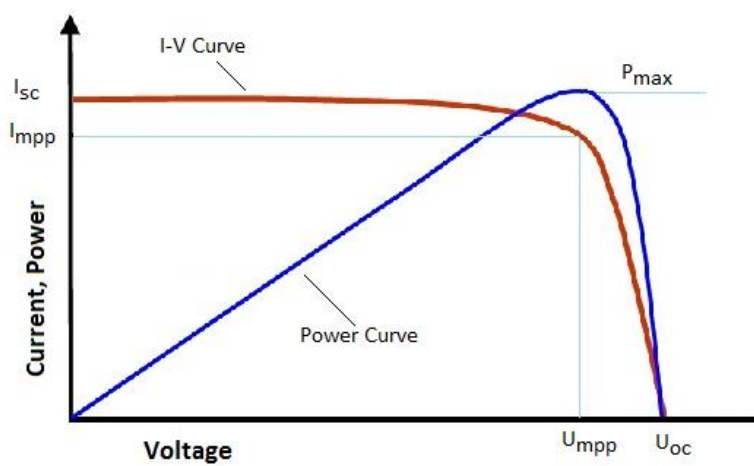


Figure 2: I-V Characteristics of a solar cell

**Date:****Reg. No.****Observations:****1.** For distance ( $x_1 =$  \_\_\_\_\_)

$$I_{\text{mp}} = \text{_____, } V_{\text{mp}} = \text{_____}$$

$$P_{\text{max}} = \text{_____}$$

$$\Omega = \text{_____, } A_C = \text{_____}$$

**Results:**

I-V characteristics of the solar cell were studied and the maximum power generated, FF and efficiency were calculated for two different source – cell distances.

For,  $x_1 =$  \_\_\_\_\_ Efficiency,  $\eta =$  \_\_\_\_\_; FF = \_\_\_\_\_