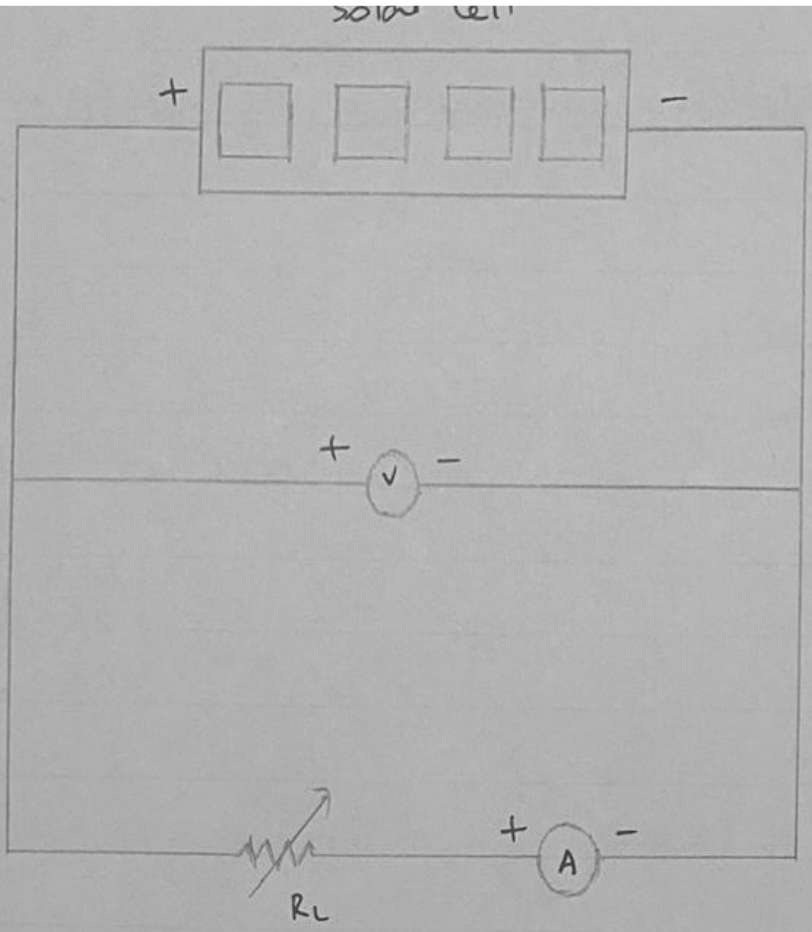

Fig 7.1. Circuit Diagram for experiment

Load Resistance	Current (mA)	Voltage (V)	Power (mW)
10	23	0.25	5.75
22	23	0.35	8.05
33	23	0.65	14.95
47	22	0.95	20.9
68	19	1.4	26.6
82	19	1.45	27.55
100	17	1.5	25.5
150	12	1.6	19.2
220	8	1.65	13.2
470	4	1.7	6.8

Table 7.1. Observations

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Clean Energy

Apparatus Required:

Solar cell, light source (100 w), Ammeter, voltmeter, load circuit, connecting wires

Student Learning Objectives:

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

Theory:

The maximum power generated:

$P_{max} = I_{mp} V_{mp}$, where I_{mp} and V_{mp} are the current and voltage corresponding to maximum power.

$$FF = \frac{V_{mp} \cdot I_{mp}}{V_{OL} \cdot I_{sc}}$$

$$\eta = \frac{P_{max}}{A_c \Omega}$$, where A_c and Ω are the area of the solar cell and the light intensity

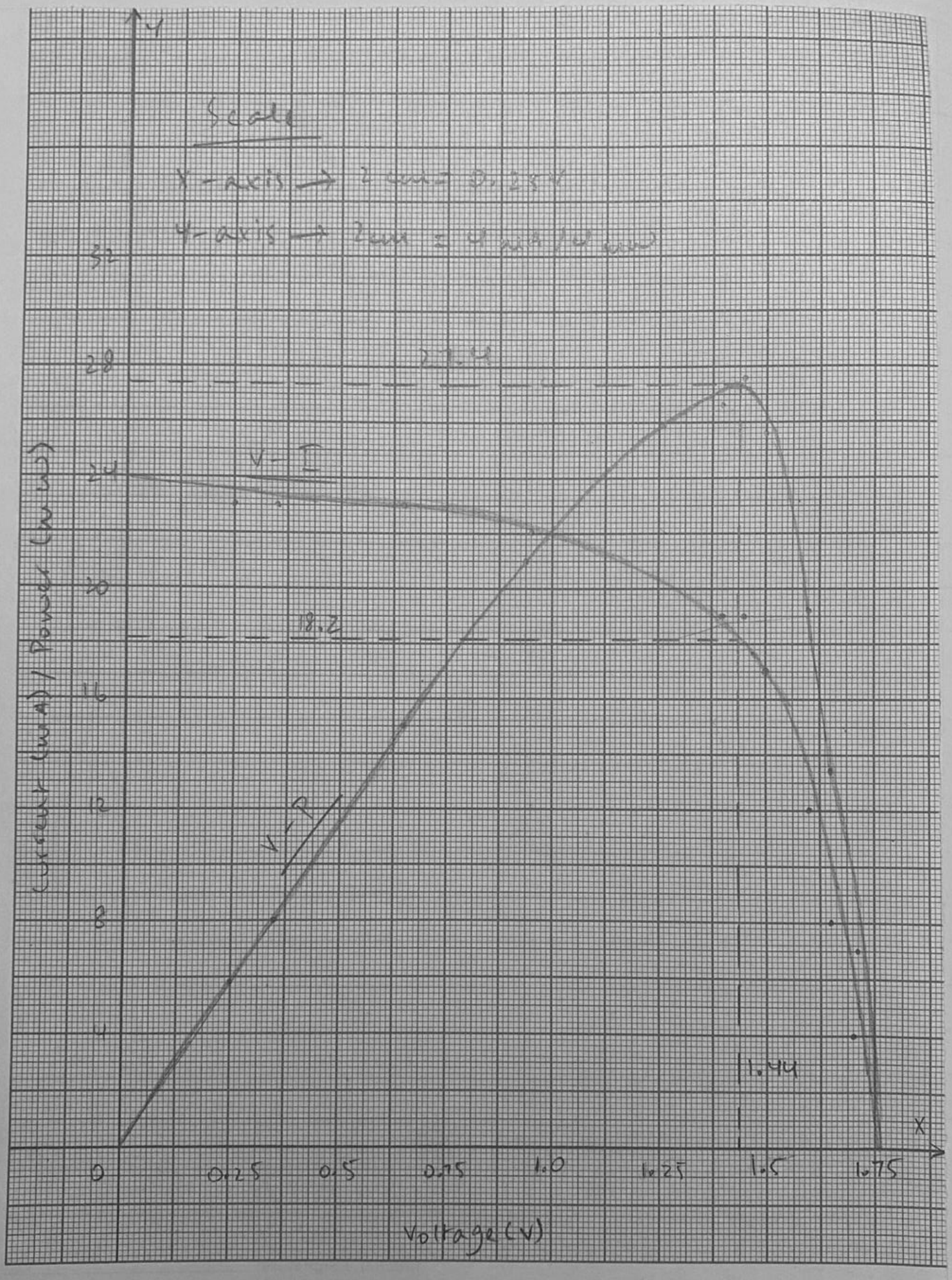
Observations:

$I_{sc} = 24$ mA

$V_{OL} = 1.85$ V

For distance $x_1 = 9$ cm

Teacher's Signature


Y
Scale
X - axis → 2 cm → 0.25 V
Y - axis → 2 cm = 4 mA (0.004 A)
32
28
24
20
16
12
8
4
21.4
18.2
V - I
Current (mA) / Power (mW)
1.44
X
0
0.25
0.5
0.75
1.0
1.25
1.5
1.75
Voltage (V)

I_{mp} = ~~27.4 mA~~ 18.2 mA

V_{mp} = 1.44 V

P_{max} = 27.4 mW

Ω = 131 W/m^2

A_c = $22.75 \times 10^{-2} dm^2$ = $22.75 \times 10^{-4} m^2$

Results:

I-V characteristics of the solar cell were studied and the maximum power generated, form factor and efficiency were calculated.

For x_1 = 9cm

Efficiency η = 0.617

FF = 9.1×10^{-6}

Teacher's Signature _____