

Name of the Student: _____

Max. Marks : 21 Marks

Time : 21 Minutes

Mark Schemes

Q1.(a) current at 0.5 V = 0.91 (A) 1

$$P = 0.91 \times 0.5$$
1

$$P = 0.455 \text{ (W)}$$

an answer of 0.455 (W) scores 3 marks

1

(b) straight line with positive gradient
allow for 1 mark a straight line that passes through (0.1, 0) 1positive y-axis intercept
ignore any values on y-axis 1

(c)
$$0.15 = \frac{0.52}{\text{total P}}$$
 1

total P = 3.47 (W) 1

$$\text{area} = \frac{3.47}{450}$$
1

$$\text{area} = 7.7 \times 10^{-3} \text{ (m}^2\text{)}$$

an answer of $7.7 \times 10^{-3} \text{ (m}^2\text{)}$ scores 4 marks
allow use of student's calculated incorrect total power for last 2 marking points

1

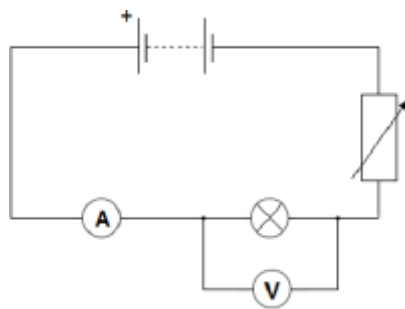
(d) connect the solar cells in parallel 1

(so that) the current has multiple paths it can take

orthe total resistance is less than the resistance of one solar cell 1**[11]**

Q2.

(a)



battery in series with bulb and ammeter

1

voltmeter in parallel with bulb

1

variable resistor

or

variable power pack

or

potentiometer

1

(b) A is brighter because it has a higher current (than lamp B at any p.d.)

1

(therefore A has a) higher power output (than bulb B)

accept higher energy output per second

1

(c) lower current (than lamp A) for the same potential difference

accept answer in terms of $R = V / I$

allow reference to a comparison of the gradients

1

this is true for all values (of p.d. on the graph)

1

(d) 0 – 2 Volts

allow a range from 0 V up to any value between 1 and 2 V.

1

(for an ohmic conductor) current is directly proportional to potential difference

allow lines (of best fit) are straight and pass through the origin

1

(so) resistance is constant

1

[10]