Practice Question Set For A-Level
Subject : Physics
Paper-1 Topic: Electricity

Merit Minds
www.merit-minds.com
Exam Preparation and Free Resources

Name of the Student:_____
Max. Marks : 17 Marks **Time : 17 Minutes**

Mark Schemes

Q1.

(a) Peak power = 107 / 108 mW and load resistance = 290 / 310 Ω ✓ **1**

Use of power = I^2R with candidate values ✓ **1**

0.0186 – 0.0193 A ✓ **1**

(b) Area of cell = 36 x 10^{-4} m^2 and solar power arriving = 730 × (an area) ✓ **1**

$\frac{0.108}{2.63}$ seen ✓ **1**

0.041 (correct answer only; lose if ratio given unit) ✓ **1**

(c) energy of one photon = $\frac{hc}{\lambda}$ = 4.0 ×10^{-19}J ✓ **1**

Number of photons = $\frac{730 \times 36 \times 10^{-4}}{4.0 \times 10^{-19}}$ = 6.6 × 10^{18} s^{-1} ✓ **1**

(d) **Two** from

Intensity of the sun at the Earth's surface
Average position of the sun
Efficiency of the panel
Power output of 1 panel
Weather conditions at the installation=
✓✓

Allow other valid physics answers= **2**

[10]

Q2.

(a) $I_3 = I_1 + I_2$ ✓ **1**

(b) 10 V ✓

1

(c) I_2 = (12 – 10) / 10 ✓

Allow ce for 10 V

1

= 0.2 A ✓

The first mark is for the pd

The second is for the final answer

1

(d) pd across R_2 increases

As R_1 increases, pd across R_1 increases as pd = I_1 R_1 ✓

First mark is for identifying that pd across R_1 increases (from zero).

1

pd across R_3 = 10 V – pd across R_1

Therefore pd across R_3 decreases ✓

Second mark is for identifying that pd across R_3 must decrease

1

pd across R_2 = 12 – pd across R_3

Therefore pd across R_2 increases ✓

Third mark is for identifying that this means pd across R2 must increase

1

[7]