M1.(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

$\dfrac{0.108}{2.63}$ seen ✓

1

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

1

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

1

Number of photons = $\dfrac{730 \times 36 \times 10^{-4}}{4.0 \times 10^{-19}}$ = 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=

Page 2

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✓ ✓

Allow other valid physics answers=

2
[10]