

EnergyPast Paper Answers AQA Physics GCSE

| Question | Answers | Extra information | Mark |
|----------|---|---|------|
| 1 | $E = \frac{1.25 \times 10^{18}}{3.16 \times 10^7}$ | | 1 |
| | $E = 3.96 \times 10^{10} \text{ (J)}$ | an answer that rounds to $3.96 \times 10^{10} \text{ (J)}$ scores 1 mark | 1 |
| 2 | $t = 86\,400 \text{ (s)}$ | | 1 |
| | $27\,000 = I \times 86\,400$ | allow a correct substitution of an incorrectly/not converted value of t | 1 |
| | $I = \frac{27\,000}{86\,400}$ | allow a correct rearrangement using an incorrectly/not converted value of t | 1 |
| | $I = 0.3125 \text{ (A)}$ | allow a correct calculation using an incorrectly/not converted value of t allow a correctly calculated answer rounded to 2 or 3 sf | 1 |
| 3 | $0.15 = \frac{\text{useful power output}}{7800}$ | allow a correct substitution of an incorrectly/not converted value of total power input | 1 |
| | useful power output = 0.15×7800 | allow a correct rearrangement using an incorrectly/not converted value of total power input | 1 |
| | useful power output = 1170 (W) | this answer only but allow 1200 (W) if correct working shown | 1 |
| 4 | a really large area of land would need to be covered with solar cells | | 1 |
| | due to the low useful power output of the solar cells | allow due to the low efficiency of the solar cells | 1 |

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| | | <p>or number of hours of daylight is too low (in UK) or low solar intensity (in UK) or solar radiation (in UK) is too low or material for construction of solar cells and/or lithium batteries is in limited supply</p> | |
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| 5 | the total energy of the racing track and the car is constant. | | 1 |
| 6 | $E_p = 0.040 \times 9.8 \times 0.90$ | allow a correct substitution of an incorrectly/not converted value of h | 1 |
| | $E_p = 0.3528 \text{ (J)}$ | this answer only | 1 |
| | $0.3528 = 0.5 \times 0.040 \times v^2$ | allow a correct substitution of a calculated E_p | 1 |
| | $v^2 = \frac{0.3528}{0.5 \times 0.040}$ | allow a correct rearrangement using a calculated E_p | 1 |
| | $v = 4.2 \text{ (m/s)}$ | allow an answer consistent with their calculated E_p | 1 |
| 7 | more than 0.20 J | | 1 |
| | (because) the car needs to be moving at the top of the loop or (because) the car needs to be moving to complete the loop or not all E_k at B will be transferred to E_p at C | this mark is dependent on scoring the first mark allow energy dissipated to the surroundings | 1 |
| 10 | in a transverse wave, the oscillations / vibrations are perpendicular to the direction of energy transfer | allow direction of wave travel for direction of energy transfer | 1 |
| | in a longitudinal wave, the oscillations / vibrations are parallel to the direction of energy transfer | | 1 |