

Energy Transfers in a System

Mark Scheme

Level	GCSE (9-1)
Subject	Combined Science: Trilogy - Physics
Exam Board	AQA
Topic	6.1 Energy
Sub-Topic	Energy Transfers in a System
Difficulty Level	Gold Level
Booklet	Mark Scheme

Time Allowed: 19 minutes

Score: /18

Percentage: /100

Grade Boundaries:

M1.(a) $600 \text{ kg} = 5880 \text{ N}$

1

$$\text{power} = \frac{5880 \times 35}{45}$$

1

$$= 4573.3 \text{ (W)}$$

this step without the previous steps stated gains 3 marks

1

$$\% \text{ Eff.} = \frac{4573.3 \times 100}{8000}$$

1

$$= 57.17 \text{ (\%)}$$

allow 57.17 with no working shown for 5 marks

1

(b) $\text{gpe} = 600 \times 9.8 \times 35$

1

$$= 205\,800$$

1

$$\text{gpe} = \text{KE} = \frac{1}{2} m v^2$$

1

$$v = \sqrt{\frac{2 \times \text{KE}}{m}}$$

1

$$= \sqrt{\frac{411\,600}{600}}$$

1

$$= 26.2 \text{ (m / s)}$$

allow 26.2 with no working shown for **6** marks

1

[11]

- M2.** (a) (i) kinetic
accept *KE*
do **not** accept movement

1

- (ii) 0.75

$\frac{60\,000}{80\,000}$

allow **1** mark for correct substitution ie
or 75 %
an answer 0.75 % **or** 0.75 with a unit gains **1** mark only
an answer 75 with or without a unit gains **1** mark only

2

- (b) any **one** from:

- large areas of land are flooded
uses large areas of land / takes up large areas of land is insufficient
- people's homes may be destroyed
- habitat (of animals and plants) lost / damaged
construct is neutral
very noisy is neutral

1

- (c) (i) system of cables and transformers
both required for the mark
accept power lines / wires for cables
ignore reference to pylons
inclusions of power stations / consumers negates answer 1

- (ii) less energy loss / wasted (in the cables)
accept heat for energy
*do **not** accept no energy loss*
*do **not** accept electricity for energy* 1

as the cables are shorter 1

[7]