

# MARK SCHEME

# GCSE

## PHYSICS

## AQA - TRIPLE SCIENCE

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P1 - TEST 3

ENERGY

Beginner

## Mark schemes

- 1.** (a) (i) water 1
- heated  
*accept boiled or turned to steam*  
*do **not** accept evaporated* 1
- generator 1
- (ii) geothermal power stations provide a reliable source of electricity 1
- (b) falling water 1
- [5]**
- 2.** (a) light 1
- correct order only*
- electrical 1
- (b) 0.2 or 1/5
- accept 20% for both marks*
- allow 1 mark for correct substitution ie  $\frac{35\,000}{175\,000}$*
- answers of 0.2% **or** 20 gain 1 mark only* 2

(c) any **one** from:

- produces no (pollutant) gases  
**or**  
no greenhouse gases  
*accept named gas*  
*accept no air pollution*  
*do **not** accept no pollution*  
*accept less global warming*  
*accept harmful for pollutant*  
*accept produces no carbon*  
*do **not** accept environmentally friendly*
- produces no / less noise
- less demand for fuels  
*accept any other sensible environmental advantage*

1

[5]

3.

(a) (i) 0.6  
**or**  
60%

*allow 1 mark for correct substitution ie  $\frac{720}{1200}$  provided no subsequent step shown*

*an answer of 0.6 / 60 with a unit gains 1 mark only*  
*an answer of 60 gains 1 mark only*

2

(ii) heat

*allow thermal*

1

(b) 12 000 p  
**or**  
£120

*to score both marks the unit must be consistent with the numerical answer*

*answers 12 000 and 120 gain 1 mark only*  
*allow 1 mark for correct substitution ie  $800 \times 15$  **or**  $800 \times 0.15$  provided no subsequent step shown*

2

[5]

4.

(a) (i) 720

*allow 1 mark for correct substitution, ie  $72 \times 10$  provided no subsequent step shown*

2

(ii) 720  
or  
their (a)(i) 1

(b) (i) gravitational potential  
*allow gravitational*  
*allow potential* 1

(ii) 432  
*allow 1 mark for correct substitution, ie  $\frac{21600}{50}$  provided no subsequent step shown* 2

watt / W 1

[7]

5.

(a) kinetic 1

(b) (i) generates a lot more energy / electricity / power  
*need fewer conventional large-scale hydroelectric power stations is neutral*  
  
or  
can supply (energy / electricity / power) to more homes 1

(ii) Large areas of land are flooded. 1

(c) (i) National Grid  
*this answer only* 1

(ii) less energy / heat loss (from the cables)  
*accept wasted for loss*  
*accept answers in terms of fewer transformers needed*  
*do not accept less electricity lost / wasted*  
*do not accept no energy lost* 1

(d) any **one** from:

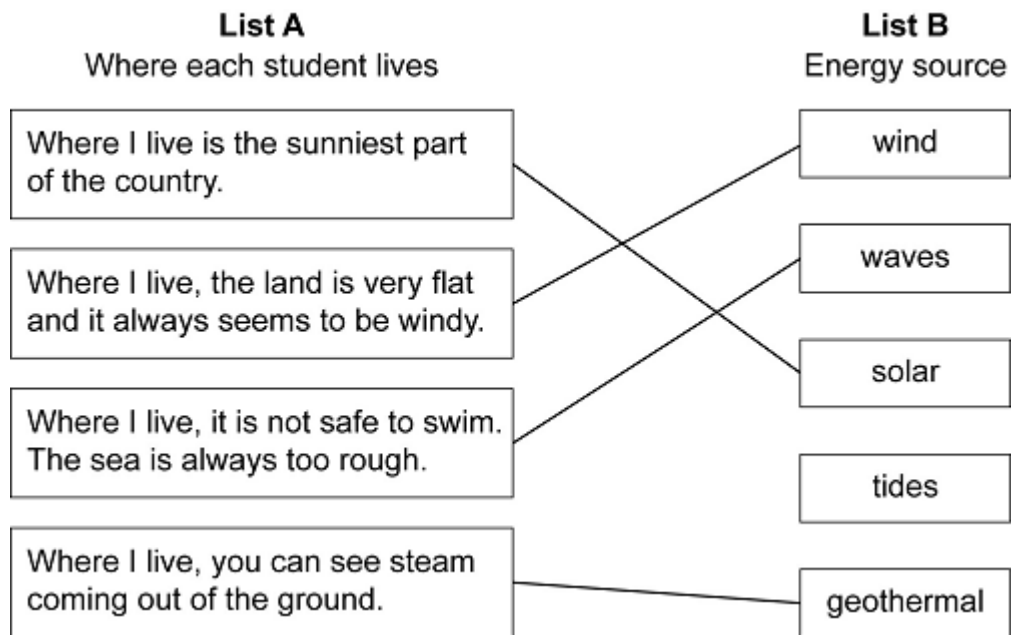
- fewer rivers (suitable for generators)
- less mountainous (so rivers fall smaller distances)  
*accept answers in terms of difficulty linking villages and towns to grid (in Nepal)*  
*accept answers in terms of more isolated communities*  
*accept answers in terms of UK having more resources for large-scale power stations*

1

[6]

6.

(a) all 4 lines correct



*allow 1 mark for each correct line*

*if more than 1 line goes from a box in **List A** then all those lines are incorrect*

4

(b) all renewable

*accept a correct description of renewable*

*eg replaced faster than used **or** never run out*

*do **not** accept can be used again*

*accept any other common feature*

*eg do not produce pollution /*

*polluting (gases)*

*no fuel is burnt*

*(energy input) is free*

*eco-friendly / environmentally friendly / natural resources /*

*sustainable sources are insufficient*

1

(c) large areas of land are flooded

1

[6]

7.

(a) (i) any **one** from:

- waves  
*do not accept water*
- tides
- falling water  
*accept hydroelectric*
- biofuel / biomass
- solar  
*accept sun / sunlight*  
*do not accept light*  
*accept solar cells / panels*
- geothermal  
*do not accept heat*

1

(ii) decrease

1

(b) (i) increases from 4am (to 8am) remains constant from 8am (to 10am)

*accept increases from 30 000*

*accept stays constant from 40 000*

*allow 1 mark for goes up then stays the same*

*for full credit must be some indication of time or power*

2

(ii) natural gas

1

[5]

8.

(a) any **two** from:

- (burning) fossil fuels produces greenhouse gases / pollutant gases / acid rain / leads to global warming  
*accept a named fossil fuel*  
*accept a named pollutant gas*
- nuclear fuels produce dangerous waste  
*accept radioactive for dangerous*  
*accept reference to dangers of nuclear fuels*
- fossil fuels are non-renewable  
*accept running out of fuels*
- renewable energy resources produce no pollutant gases
- large amounts of energy are available  
*accept renewable won't run out*
- running costs are low  
*accept any reasonable benefit of renewables*  
*accept any reasonable drawback of non-renewables*  
*do not accept better for the environment on its own*

2

(b) **R U S T**

*all in correct order*  
*allow 2 marks for 2 correct*  
*allow 1 mark for one correct*

3

[5]

9.

(a) gas

1

oil

1

(b) (both) use steam to drive a turbine

*accept (both) use turbines to drive generators*  
*do not accept both have a turbine /generator / use steam*  
*must describe a step in the process*  
*accept heat / thermal energy transformed to kinetic / electrical energy*

1

(c) 140 (°C)

*correct answer only*

*allow 1 mark for method clearly shown on graph*

*accept a cross or other indication at correct position on the line*

*accept correct description*

*accept even if numerical answer is incorrect*

2

(d) any **one** from:

*do **not** accept answers purely in terms of disadvantages of other methods except for fossil fuels are running out*

- very large energy source / reserves
- no polluting / harmful gases produced  
*accept named gas CO<sub>2</sub> SO<sub>2</sub> NO<sub>x</sub>*  
*accept reduces harmful carbon emissions*
- reduces carbon emissions  
*accept does not contribute to global warming*
- no fuel needed
- energy is free
- can generate energy for a long time  
*accept energy available for a long time*
- renewable (energy source)
- fossil fuels are running out  
*accept it saves fossil fuels / non-renewable*  
*accept reduces the amount of fossil fuels being burnt*  
*accept a named fossil fuel*  
*Better for the environment / environmentally friendly insufficient*  
*it is cheaper is insufficient*

1

[6]