Practice Question Set For GCSE
Subject : Physics
Paper-1 Topic: Energy (Standard Demand)

Name of the Student:_____
Max. Marks : 18 Marks **Time : 18 Minutes**

Mark Schemes

Q1.

(a) (i) coal

1

(ii) any **two** from:

ignore coal, oil, natural gas, nuclear, hydroelectricity and wind

- tidal
- wave
- biofuel / biomass
  allow waste incineration / burning
  allow named biomass eg wood
- solar
  ignore Sun
- geothermal
  ignore water

2

(b) Marks awarded for this answer will be determined by the Quality of Written Communication (QWC) as well as the standard of the scientific response. Examiners should apply a "best-fit' approach to the marking.

0 marks
No relevant content.

(1–2 marks)
A brief description of an advantage of the chosen energy resource **or** a disadvantage of the rejected energy resource has been given.

There is little scientific terminology used.

(3–4 marks)
A clear description of either advantages **and** / **or** disadvantages have been described
Some scientific terminology is used

(5–6 marks)
A detailed description of advantages of the chosen energy resource **and** disadvantages for the rejected energy resource have been described.
Scientific terminology is used accurately.

Physics responses

ignore circling of nuclear / wind ignore references to any other energy resources

Nuclear:

advantage:

- large amount of energy released (per kg of fuel)
- large fuel reserves
  allow there is a lot of uranium (in the ground)
- reliable electricity supply

disadvantage:

- radioactive waste
  allow waste is harmful / dangerous ignore nuclear waste
- waste remains radioactive for many years
  accept waste has a long half-life allow dangerous / harmful for radioactive
- waste has to be stored (for many years)
  allow difficult to dispose of
- non-renewable
  allow unsustainable or will (eventually) run out
- high decommissioning cost
- high commissioning cost
  allow cost more to build
- long time needed to build
- long start-up time
- risk of meltdown / large scale disaster
  allow named disaster eg Chernobyl, Fukushima, Japan
  ignore visual pollution / eyesore for both energy resources
- (fuel) has to be mined
  ignore air pollution / greenhouse gases / carbon dioxide for both energy resources
  ignore cost of electricity for both resources

Wind:

ignore the UK is very windy

advantage:

- renewable
- land still useable beneath turbines
  allow sustainable or won't run out

- no fuel cost
  allow wind is free
- short start-up time
- short time needed to build
- set up cost is lower

disadvantage:

- unreliable (wind / electricity)
- very large number of turbines needed (1000s)
- high set up cost (for many turbines)
- connection to National Grid is difficult / expensive
- (single turbine has) low output
  allow kills birds
  allow noisy / noise pollution
  ignore causes headaches / migraines
  ignore visual pollution / eyesore for both energy resources
  ignore air pollution / green house gases / carbon dioxide for both energy resources
  ignore cost of electricity for both resources

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Q2.

(a) VAWT generates electricity at (wind) speeds lower than HAWT do
ignore quoted figures without comparative statements
*accept for **2** marks generates electricity over a greater range of (wind)speeds*

1

VAWT generates electricity at higher (wind)speeds

1

VAWT can generate electricity over a longer time period
allow VAWT generates more electricity (over a given time period)
allow VAWT doesn't need to turn (into the wind)
(ignore the converse)
ignore the wind can come from any direction

1

(b) any **two** from:
*if no reference to power / output allow max **1** mark*
*if cause and effect are the wrong way round allow max **1** mark*

- very little power / output until 2 (m/s)
  allow no power / output until 2 (m/s)
  allow a value between 1.5 – 2 (m/s)

- as wind speed increases, power / output increases . . .
- . . . at an increasing rate

allow figures to show this

2

(c) (i) 150 (metres)

allow any value in the range 141 – 159 (metres)

1

(ii) (No, because) the sound level is 20dB less than 30dB / less than a whisper at a distance of 1000m (is worth 2 marks)

allow at the nearest house for a distance of 1000m

*allow **1** mark for reading the sound level at 1000m (20dB)*

or

*allow **1** mark for (no) the noise level will be very low (at 1000m)*

*allow **1** mark for (Yes)*

no additional noise is justified in the country side / on the island

***2** marks can be gained for a 'Yes' answer*

*allow **1** mark for (Yes)*

we don't know how many wind turbines would be installed / many wind turbines create more noise

2

(d) <u>reduces</u> energy loss (in cables)

allow 'heat' for energy

allow power for energy

allow to <u>increase</u> efficiency (of power transmission)

ignore less electricity wasted

*do **not** accept prevents or stops energy loss*

1

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