Name of the Student:_____
Max. Marks : 21 Marks **Time : 21 Minutes**

Mark Schemes

Q1.

(a) advantage

any **one** from:

- produce no / little greenhouse gases / carbon dioxide
  allow produces no / little polluting gases
  allow doesn't contribute to global warming / climate change
  allow produce no acid rain / sulphur dioxide
  reference to atmospheric pollution is insufficient
  produce no harmful gases is insufficient
- high(er) energy density in fuel
  accept one nuclear power station produces as much power as several gas power stations
  nuclear power stations can supply a lot of or more energy is insufficient
- long(er) operating life
  allow saves using reserves of fossil fuels or gas

1

disadvantage

any **one** from:

- produce (long term) radioactive waste
  accept waste is toxic
  accept nuclear for radioactive
- accidents at nuclear power stations may have far reaching or long term consequences
- high(er) decommissioning costs
  accept high(er) building costs
- long(er) start up time

1

(b) (i) 12 000 (kWh)
*allow **1** mark for correct substitution eg*
2000 × 6
or
2 000 000 × 6
or
$\frac{12\,000\,000}{1000}$

*an answer of 12 000 000 scores **1** mark*

2

(ii) any idea of unreliability, eg

- wind is unreliable
  reference to weather alone is insufficient
- shut down if wind too strong / weak
- wind is variable

1

(c) any **one** from:

- cannot be seen
- no hazard to (low flying) aircraft / helicopters
- unlikely to be or not damaged / affected by (severe) weather
  unlikely to be damaged is insufficient
- (normally) no / reduced shock hazard
  safer is insufficient
  less maintenance is insufficient
  installed in urban areas is insufficient

1

[6]

Q2.

(a) water moves (from a higher level to a lower level)

1

transferring GPE to KE

1

rotating a turbine to turn a generator
accept driving or turning or spinning for rotating
moving is insufficient

1

transferring KE to electrical energy
*transferring GPE to electrical energy gains **1** mark of the **2** marks available for energy transfers*

1

(b) (TVs in stand-by) use electricity
accept power / energy

1

generating electricity (from fossil fuels) produces CO_2
accept greenhouse gas
accept sulfur dioxide

1

(CO_2) contributes to global warming
accept climate change for global warming
accept greenhouse effect if CO_2 given
accept acid rain if linked to sulfur dioxide

1

(c) a factor other than scientific is given, eg economic, political or legal

personal choice is insufficient

1

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Q3.

(a) 450

*allow **1** mark for correct substitution,*

ie 18 × 10 × 2.5 provided no subsequent step shown

2

(b) (i) friction between child ('s clothing) and slide

accept friction between two insulators

accept child rubs against the slide

accept when two insulators rub (together)

1

causes electron / charge transfer (between child and slide)

accept specific reference, eg electrons move onto / off the child / slide

reference to positive electrons / protons / positive charge / atoms transfer negates this mark

answers in terms of the slide being initially charged score zero

1

(ii) all the charges (on the hair) are the same (polarity)

accept (all) the charge/hair is negative / positive

accept it is positive/negative

1

charges / hairs are repelling

both parts should be marked together

1

(iii) charge would pass through the metal (to earth)

accept metal is a conductor

accept metal is not an insulator

accept there is no charge / electron transfer

accept the slide is earthed

accept metals contain free electrons

1

[7]