

Name of the Student: _____

Max. Marks : 19 Marks

Time : 19 Minutes

Mark Schemes

Q1.

- (a) (i) tidal / tides
*do **not** accept water / waves*

1

- (ii) any **three** from:

- shorter journey time
accept easier to go from town to town
accept less petrol / fuel used
- less pollution from traffic
accept CO₂ / carbon emissions reduced
- energy source is free
- energy source / tides are predictable
- produces less / no pollutant gases (than fuel burning power stations)
accept no CO₂ / greenhouse gases produced
accept air pollution for pollutant gases
- conserves supplies of fossil fuels
- uses renewable energy (to generate electricity)
- provides employment
- no visual / noise pollution
less harm to the environment is insufficient
the electricity is cheaper is insufficient
*do **not** accept produces no radioactive waste*
the pollution mark scores twice only if it is clear one reference is to traffic and the other is to electricity generation

3

- (b) (i) (sometimes) electricity demand may be greater than supply (of electricity from the system)
accept in case turbines / generators fail
or
can sell (excess) electricity (to the National Grid)

1

- (ii) decreases the current

accept increases the voltage

1

reducing energy loss (along cables)

accept less heat / thermal energy lost / produced

1

[7]

Q2.

(a) decrease in oil

PLUS

any **one** from:

- increase in (proportion of) coal
- increase in (proportion of) nuclear
- increase in (proportion of) gas
must have decrease in (proportion of) oil and increase in (proportion of) coal / nuclear / gas

1

(b) (i) (nuclear) fission

accept fision

*do **not** accept any answer that looks like fusion*

1

(ii) water heated to produce (high pressure) steam

1

steam turns turbine which drives generator

1

(iii) any **two** from:

- produces no pollutant gases
accept named gas or greenhouse gases
accept no atmospheric pollution
accept harmful for pollutant
accept does not contribute to global warming
*do **not** accept no pollution on its own*
*do **not** accept better for the environment unless qualified*
- it is reliable **or** can generate all of the time
- concentrated energy source **or** produces a lot of energy from a small mass
- produces only small volume of (solid) waste
- fossil fuels will last longer
accept a named fossil fuel
accept fossil fuels are running out
*do **not** accept fossil fuels are non-renewable unless qualified*
- will need to buy less fuel from other countries
accept no new fossil fuel power stations needed

do **not** accept it is cheap
do **not** accept import less electricity

2

- (iv) it is / can be radioactive
do **not** accept answers in terms of kills cells / cancer

or emits radiation (from the nuclei)
accept emits gamma (rays)

1

- (c) coal (burning) power stations / burning coal produces carbon dioxide
they refers to coal-burning power stations
accept sulfur dioxide / nitrogen oxides for CO₂

1

(increased) CO₂ increases / contributes to / causes global warming /
greenhouse effect

mention of ozone layer negates this mark
do **not** accept CO₂ warms atmosphere

1

[9]

Q3.

- (a) (i) replaced faster than it is used
accept replaced as quick as it is used
accept will never run out
do **not** accept can be used again

1

- (ii) any **two** from:
two sources required for the mark

- wind
- waves(*)
- tides(*)
(*)do **not** accept water / oceans
accept OTEC
- fall of water
accept hydroelectric
- biomass
- geothermal
accept a named biomass / biofuel eg wood

1

- (b) (i) any **two** from:
- increases from 20° to 30°
 - reaches maximum value at 30°
 - then decreases from 30°

- same pattern for each month
accept peaks at 30° for **both** marks
accept goes up then down for **1** mark
ignore it's always the lowest at 50°

2

(ii) 864

an answer of 108 gains **2** marks
allow **1** mark for using 720 value only from table
allow **2** marks for answers 852, 816, 768, 825
allow **1** mark for answers 106.5, 102, 96, 103 (.125)

3

- (c) the solar cells will not meet demand at all times of the year / day
accept to maintain a constant supply of electricity / energy

or to make up the shortfall in energy required at certain times of the year

or to be able to sell surplus electricity (to the National Grid)

accept to provide energy at night
do **not** accept because it's cloudy on it's own

1

[8]