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

Mark Schemes

Q1.

(a) *answers must be in terms of nuclear fuels*

concentrated source of energy
idea of a small mass of fuel able to generate a lot of electricity
1

that is able to generate continuously
accept it is reliable
or *can control / increase / decrease electricity generation*
idea of available all of the time / not dependent on the weather
ignore reference to pollutant gases
1

the energy from (nuclear) fission
1

is used to heat water to steam to turn turbine linked to a generator
1

(b) carbon dioxide is not released (into the atmosphere)
1

but is (caught and) stored (in huge natural containers)
1

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Q2.

(a) 9

*allow **2** marks for power = 1400 (kW)*
*if a subsequent calculation is shown award **1** mark only*
or
*allow **1** mark for correct substitution and transformation*

$$\text{power} = \frac{5600}{4}$$

*allow **1** mark for using a clearly incorrect value for power to read a corresponding correct value from the graph*
3

(b) (i) system of cables and transformers
both required for the mark
ignore reference to pylons

inclusion of power stations / consumers negates the mark
wire(s) is insufficient

1

(ii) (uses step-up transformer to) increase pd / voltage
accept (transfers energy / electricity at) high voltage
or
(uses step-up transformer to) reduce current
accept (transfers energy / electricity at) low current
ignore correct references to step-down transformers

1

(c) build a power station that uses a non-renewable fuel or biofuel
accept a named fuel
eg coal or wood
or
buy (lots of) petrol / diesel generators

1

stockpile supplies of the fuel
accept fuel does not rely on the weather
or
fuel provides a reliable source of energy
accept as an alternative answer idea of linking with the National Grid (1)
and taking power from that when demand exceeds supply (1)
or
when other methods fail
or
when it is needed
answers in terms of using other forms of renewables is insufficient

1

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Q3.

(a) 13 500 (J)
*allow **1** mark for correct substitution, ie 90 x 10 x 15 provided no subsequent step shown*

2

(b) 17
or
$\sqrt{\frac{\text{their (a)}}{45}}$

correctly calculated and answer given to 2 or 3 significant figures
accept 17.3
*allow **2** marks for an answer with 4 or more significant figures, ie 17.32*
or
*allow **2** marks for correct substitution, ie 13 500/ their (a) = ½ x 90 x v^2*
or
*allow **1** mark for a statement or figures showing KE = GPE*

3

(c) work is done

1

(against) friction (between the miner and slide)

*accept 'air resistance' **or** 'drag' for friction*

1

(due to the) slide not (being perfectly) smooth

accept miners clothing is rough

or

causing (kinetic) energy to be transferred as heat/internal energy of surroundings

accept lost/transformed for transferred

accept air for internal energy of surroundings

1

[8]