Name of the Student:_____
Max. Marks : 17 Marks **Time : 17 Minutes**

Mark Schemes

Q1.

(a) *P* = 696 000 000 (W)

1

P = 1200 (W)

allow an answer consistent with their incorrectly / not converted value of P

1

(b) any **2** from:

- wind is unreliable

  allow it was not windy (on that day)

- wind turbines don't turn when the wind is too strong/weak
- there are not enough wind turbines (in the UK)

  allow some wind turbines may be offline for maintenance

  allow energy from wind may not be enough (to generate 34 000 MW)

  ignore weather conditions unqualified

2

(c) the efficiency would increase

1

because the percentage / proportion / amount of energy usefully transferred would increase

ignore more electricity generated

or

because the percentage / proportion / amount of energy wasted would decrease

allow less energy wasted

1

(because) less (work is done against) friction

1

(d) more efficient devices waste less energy

or

more efficient devices need a lower energy input (for the same energy output)

ignore use less electricity

1

which would minimise the electricity / energy demand

allow less electricity needs to be generated

allow lower energy / electricity bill

or

which would minimise the environmental impact from (fossil fuel) electricity generation

allow examples of environmental impact e.g. lower CO_2 emissions

ignore 'better for the environment' unless qualified

ignore answers that discuss 'saving energy' unless qualified

ignore answers that discuss alternative methods of generating electricity

1

[9]

Q2.

(a) $P = V \times I$

1

(b) $4.4 = 40 \times I$

1

$I = \frac{4.4}{40}$

1

$I = 0.11$ (A)

1

(c) $\text{efficiency} = \frac{\text{useful power output}}{\text{total power input}}$

1

(d) $0.85 = \frac{P}{4.0}$

1

$P = 0.85 \times 4.0$

1

$P = 3.4$ (W)

1

[8]