

Name of the Student: _____

Max. Marks : 18 Marks

Time : 18 Minutes

Mark Schemes

Q1.

Question Number	Answer	Acceptable answers	Mark
(a)	D driving for a long time without taking a break		(1)

Question Number	Answer	Acceptable answers	Mark
(b)(i)	substitution $1200 \times 8(.0)$ (1) evaluation 9600 (J) OR $9.6 \times 10^3 \text{ (J)}$ (1)	Give full marks for correct answer with no working. $9.6 \times$ any other power of 10 = 1 mark	(2)

Question Number	Answer	Acceptable answers	Mark
(b)(ii)	substitution $0.5 \times 1400 \times 25^2$ (1) evaluation of v squared $0.5 \times 1400 \times 625$ (1) evaluation $4.4 \times 10^5 \text{ (J)}$ (1) OR 440 000	Give full marks for correct answer with no working. accept 625 seen anywhere for this mark e.g. 875 000 gets 1 mark (forgot $\frac{1}{2}$) $437\,500 \text{ (J)}$ $4.4 \times$ any other power of 10 = 2 marks	(3)

Q2.

	Answer	Acceptable answers	Mark
(ai)	Model A because Model A (can produce up to)7200kWh per year	Model B produces less than 6000kWh per year at 13mph /requires wind speed	(1)

	(at 13mph) / will produce 6000 kWh (with given wind speed). (1)	of more than 13mph to produce 6000kWh	
(a ii)	Substitution (1) 0.14×6000 Evaluation (1) (£)840	Allow incorrect conversion of p to £ such as 0.014×6000 for 1 mark only 84 000 p correct answer with no working shown gains both marks	(2)
(a iii)	Divide the installation cost by the annual saving (to find the time in years) (1)	£840 for annual saving	(1)
(a iv)	A suggestion linking (energy saving lamps) would not transfer so much thermal energy (1) he may have to use additional heating / lights (which would cost money to run/ purchase) (1)	not get hot / produce so much heat reverse argument such as insufficient heat for chicks to thrive (Ignore references to light output.)	(2)

		Indicative Content	Mark
QWC	*(b)	A discussion including some of the following points • Both HEP and Solar power are renewable • Both HEP and Solar power would save fossil fuels • HEP only possible in some locations • HEP requires reservoirs and damming of rivers • This can damage environment /takes a lot of land out of use • Energy from solar power installation is currently much less than energy from fossil fuel powered station	(6)

		• Solar power only suitable in certain locations • Solar power reliability dependent on constant sunshine • Neither of them cause atmospheric pollution	
Level	0	No rewardable content	
1	1 - 2	• a limited description such as at least one relevant detail of each resource eg: Solar power doesn't give off atmospheric pollution. HEP generates more power than solar power. • the answer communicates ideas using simple language and uses limited scientific terminology • spelling, punctuation and grammar are used with limited accuracy	
2	3 - 4	• a simple discussion such as one which gives comparisons between the two or at least an advantage and disadvantage of both. eg: HEP does not use fossil fuels but it can damage the environment where it is located. Solar power will never run out but it requires lots of light/land. • the answer communicates ideas showing some evidence of clarity and organisation and uses scientific terminology appropriately • spelling, punctuation and grammar are used with some accuracy	
3	5 - 6	• a detailed comparison such as one which relates advantages and disadvantages of both HEP and solar power to a particular situation for possible large scale use e.g.: Solar power uses a renewable energy source but it currently does not produce as much energy as fossil fuel station where there is little sunlight. HEP can produce a lot more energy where there are hills and water but only possible in certain geographical locations. • the answer communicates ideas clearly and coherently uses a range of scientific terminology accurately • spelling, punctuation and grammar are used with few errors	