Question number	Answer	Notes	Marks
1 (a)	one mark for each correct tick;;; | Energy source	Tick | |---|---| | wind | | | oil | ✓ | | coal | ✓ | | geothermal | | | bio-gas | | | nuclear | ✓ |	2 marks max. if 4 ticks 1 mark only if 5 ticks 0 marks if 6 ticks	3
(b)	advantage: any one from • high energy density / eq; • short start up time / adaptable to demand; • reliable technology; • does not depend on weather conditions; • (relatively) cheap; disadvantage: any one from • produces CO_2 / greenhouse gases / air pollution / sulphur dioxide / nitrous oxide; • causes global warming; • causes acid rain;	ignore ideas about transportation **allow 'produces large amount of energy'** allow non-renewable **ignore unqualified 'damages environment', 'pollution' etc.**	2

Total for question 1 = 5 marks

Question number	Answer	Notes	Marks
2 (a) (i)	power = voltage x current;	allow rearrangements and use of standard symbols e.g. P = V x I do not allow c/C/A for current	1
(ii)	substitution; rearrangement; evaluation; e.g. 6.5 = 230 x I (I =) 6.5 / 230 (I =) 0.028 (A)	allow 0.03, 0.0283**, 0.02826...** (A) do not allow 0.02 (A)	3
2 (b)	1 mark for each correct;;;		3

S1	S2	S3	Lamp
up	up	up	on
down	down	down	off
up	up	down	off
down	up	up	off
up	down	down	on

Total for question 2 = 7 marks

Question number	Answer	Notes	Marks
4 (a)	(total) momentum before (a collision) = (total) momentum after (a collision);	**ignore unqualified 'momentum is conserved'**	1
(b)	correct value of momentum before collision seen anywhere in the calculation; substitution into balanced equation; evaluation of velocity; e.g. (momentum before =) 1.6 (kgm/s) $1.6 = 0.16 \times 8 + 0.16 \times v$ (v =) 2 (m/s)	either as 0.16 x 10 or 1.6	3
(c)	calculation of KE before collision; calculation of KE of either ball after collision; evaluation of energy difference; e.g. $0.5 \times 0.16 \times 10^2$ $(0.5 \times 0.16 \times 8^2)$ OR $(0.5 \times 0.16 \times 2^2)$ $(8 - (5.12 + 0.32) =) 2.6$ (J)	ecf from (b) 8 (J) 5.12 OR 0.32 (J) allow 2.56 (J)	3

Total for question 4 = 7 marks