Question number	Answer	Notes	Marks
3	Any FOUR of Reaction time of driver (inc comment on drink/drugs / driver paying attention / driver distracted /driver tired); Condition of car's brakes/force applied to brakes; Condition of car's tyres; Condition of road surface (inc ice/water/mud /friction ideas); Stopping distance of car; Velocity / speed / behaviour of rabbit (across road); Distance of rabbit from car; Visibility factor (e.g. fog / dirty windscreen); ALLOW MAXIMUM of TWO from these Kinetic energy of car; Momentum of car; Velocity / speed of car; Mass / weight of car / number of passengers;	ACCEPT 'thinking distance / time' as an alternative to these points IGNORE 'condition of driver' ACCEPT 'braking distance (of the car)' as an alternative to these three 'condition' points IGNORE 'condition of car' i.e. momentum of car <u>and</u> velocity of car <u>and</u> mass of car only scores two of the marks available	4

Total 4 Marks

Question number			Answer	Notes	Marks
13	(a)		A (chemical → electrical → kinetic)		1
	(b)	(i)	KE = ½ x m x v^2 ;		1
		(ii)	substitution into correct equation; Calculation; e.g. ½ x 600 x 28^2 ; 240000 (J);	correct answer = 2 marks ACCEPT 235200 (J);	2
	(c)	(i)	gpe = mass x g x height;	ACCEPT GPE = mgh ACCEPT gravitational field strength/acceleration due to gravity for g	1
		(ii)	substitution into correct equation; Calculation; e.g. 600 x 10 x 1000 6 000 000 (J) or 6000 k(J) or 6 M(J)	correct answer = 2 marks ALLOW 5 880 000 (from g = 9.8)	2
		(iii)	EITHER Calculation of energy supplied (by fuel cells) 24 kW x 180 s OR 4 320 000 (J); Comparison with energy required 4 320 000 < 6 000 000; OR Calculation of power required 6 000 000 J ÷ 180 s OR 33.3 kW; Comparision with fuel cells 33.3 kW > 24 kW;	 ALLOW ECF if 6 000 000 not seen ALLOW ECF if 6 000 000 not seen	2

Question number	Answer	Notes	Marks
13 (c) (iv)	use of P= I x V for one cell ; e.g. 30 x 0.6 OR 18(W) calculation; e.g 24 000 ÷ 18 = 1333 (> 1300) OR 1300 x 18 = 23400 (< 24000) ALTERNATIVE Using E= IVt for one cell; e.g. 30 x 0.6 x180 OR 3240(J) calculation; e.g. 4 320 000 ÷ 3240 = 1333 (> 1300) OR 1300 x 3240 = 4 212 000 (< 4 320 000)	First Marking Point can be credited if '18' or '30 x 0.6' seen in calculation	2

Total 11 Marks