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Mark Scheme (Results)

June 2011

360Science

GCSE Additional Science
Structured Paper P2 (5020H/1H)

GCSE Physics
Structured Paper P2 (5048H/1H)

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5020H & 5048H Mark Scheme
June 2011

Question Number	Answer	Acceptable answers	Ignore	Reject	Mark
1	**Marks may be in any order**. 1. (flashes of)light get further apart ; 2. idea that plane changes direction;	allow dots for lights path is curved /bent	getting dimmer		**(2)**

Question Number	Answer	Acceptable answers	Ignore	Reject	Mark
2(a)	like charges repel ;	• (negative) hairs repel (each other) • hair repelled by head • (because of) static (electricity) • electrons repel	• repeat of stem • idea of transfer of electrons to positive hair		**(1)**

Question Number	Answer	Acceptable answers	Ignore	Reject	Mark
2(b)	Any **three** from: 1. comb / plastic is an insulator; 2. idea of charging by friction or rubbing; 3. electrons; 4. (negative charges) <u>transfer</u>; 5. from comb (to hair) ;	friction causes static	repeat of stem e.g. 'combs' 'puts a negative charge'	for MP3,4 and 5 idea of protons or positive charges moving positive electrons	**(3)**

Question Number	Answer		Acceptable answers	Ignore	Reject	Mark
3(a)	**substitution**	= 80 x 7.5;				
	evaluation	= 600;	bald correct ans = 2 marks unit independent			
	unit	N;	acceptable units are • kg m/s^2 • newton		for unit mark • Ns • kg/m/s^2	**(3)**

Question Number	Answer		Acceptable answers	Ignore	Reject	Mark
3(b)	**substitution**	(a =) $\frac{0 - 25}{0.12}$	a = $\frac{25 - 0}{0.12}$	signs		
	evaluation	(-)210	208 bald correct ans = 2 marks			**(2)**

Question Number	Answer	Acceptable answers	Ignore	Reject	Mark
4(a)(i)					

particle	**nature**	**charge**	**range in air**	**ionising ability**
alpha	2 protons and 2 neutrons	+ 2	5 cm	high / strong / good/ best
beta	either • electron or • positron	- / minus + / positive	over 50 cm	medium
		1		

reject contradiction within a box for that box

;;

4 correct = 2 marks
2 or 3 correct = 1 mark
1 correct = 0

(2)

Question Number	Answer	Acceptable answers	Ignore	Reject	Mark
4(a)(ii)	Any **one** of the following ideas which compare alpha and beta: 1. (alpha has) high(er) ionising ability; 2. (alpha) more likely to make collision ; 3. bigger charge ; 4. travels slower ;	‘more’ or ‘greater’ for ‘higher’ makes many collisions more mass	ideas of penetration or absorption		**(1)**

Question Number	Answer	Acceptable answers	Ignore	Reject	Mark
4(b)(i)	same number protons AND different number of neutrons;	same {element / atomic number} different {mass / nucleon} number e.g. same element different number of neutrons	same atom electrons		**(1)**

Question Number	Answer	Acceptable answers	Ignore	Reject	Mark
4(b)(ii)	1. idea that two half-lives mean divide by 4 / eq ; 2. 40 (Bq) ;	 correct answer full marks allow $\frac{160}{2}$ or 80 (Bq) for 1 mark			**(2)**

Question Number	Answer	Acceptable answers	Ignore	Reject	Mark
4(b)(iii)	Any **two** from: 1. breathe in gas ; 2. short range of alpha (in air); 3. damage /ionise tissue ; 4. radon gas can {disperse/spread} ORA;	 solid can't enter the body as easily does not penetrate skin damage to { lungs / cells /mouth } can cause cancer radon gas is harder to contain can build up (in houses) harder to filter from the air solid cannot {disperse/spread}	 harder to see solid harder to escape the solid does not penetrate paper damage to body /person		**(2)**

Question Number	Answer	Acceptable answers	Ignore	Reject	Mark
4(b)(iv)	for 1 mark any **one** from: 1. radon from rocks / ground 2. some parts of the country have high levels of radon-bearing rocks 3. radon major contributor to background ; AND for 1 mark idea that higher levels of gas give a higher background;	 from granite / soil different levels of {radon / gas} in different parts of the country biggest % / (over) ½ / 50% less radon gas reduces the background			**(2)**

Question Number	Answer		Acceptable answers	Ignore	Reject	Mark
5(a)(i)	**substitution ;** **evaluation ;**	(KE =) ½ x0.057x 5.6^2 =0.89 (J) (which rounds to 0.9)	allow alternative methods e.g. start with KE = 0.9.....	unit		**(2)**

Question Number	Answer		Acceptable answers	Ignore	Reject	Mark
5(a)(ii)			sub and transpose in either order			
	substitution	0.89=0.057x10xh	ecf from (a) allow use of 0.9 for energy value			
	transp.	h= $\frac{0.89}{10 \times 0.057}$	h= $\frac{0.9}{10x.057}$			**(3)**
	evaluation	1.6 (m)	1.56 (m) to 1.58 bald correct ans = 3 marks			

Question Number	Answer	Acceptable answers	Ignore	Reject	Mark
5(a)(iii)	air resistance (increases the force acting on the ball);	{air friction} / drag (slows the ball down quicker) energy is lost as {heat / thermal}	changes in g wind sound comments about density		**(1)**

Question Number	Answer	Acceptable answers	Ignore	Reject	Mark
5(b)	Idea of increase in speed **AND** more initial energy ;	faster (at C) more KE (at C/ gained) more PE at A more energy from elastic band			**(1)**

Question Number	Answer	Acceptable answers	Ignore	Reject	Mark
5(c)	Any **two** from: 1. acceleration is downwards ; 2. {momentum /velocity} is upwards ; 3. (resultant) force reduces the {velocity / momentum} (to zero) ;	 acceleration is in opposite direction to {velocity/speed} ball is slowing down ball is decelerating still has momentum (resultant/downward) force causes {slowing down/deceleration}	KE PE	upward {force/acceleration} for MP1 and MP2	**(2)**

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