

# **Additional Science A**

General Certificate of Secondary Education

Unit **A217/01**: Modules B6, C6, P6 (Foundation Tier)

## **Mark Scheme for June 2011**

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All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes should be read in conjunction with the published question papers and the Report on the Examination.

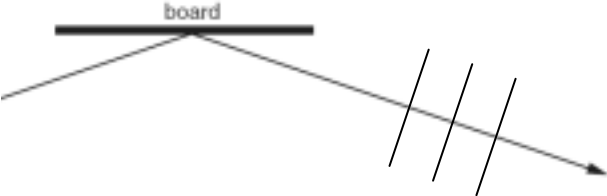
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Question		Answer	Mark	Guidance						
1	a	<p style="text-align: center;"> <input type="checkbox"/>                      cancels out the direct wave <input checked="" type="checkbox"/> (1)  <input type="checkbox"/>  <input type="checkbox"/> </p>	1							
	b		2	curved lines = 0 marks <b>three</b> wavefronts of correct spacing (same as before hitting board) on the right of board (1)  at right angles to reflected ray (1)						
	c	<table border="0" style="width: 100%;"> <tr> <td style="border: 1px solid black; padding: 5px;">speed</td> <td style="border: 1px solid black; padding: 5px;">The distance between ...</td> </tr> <tr> <td style="border: 1px solid black; padding: 5px;">frequency</td> <td style="border: 1px solid black; padding: 5px;">The distance moved ...</td> </tr> <tr> <td style="border: 1px solid black; padding: 5px;">wavelength</td> <td style="border: 1px solid black; padding: 5px;">The number of ...</td> </tr> </table>	speed	The distance between ...	frequency	The distance moved ...	wavelength	The number of ...	2	correct pattern for 2 marks  one or two mistakes for 1 mark  a mistake is <ul style="list-style-type: none"> <li>• a line in the wrong place</li> <li>• a missing line</li> <li>• an extra line</li> </ul>
speed	The distance between ...									
frequency	The distance moved ...									
wavelength	The number of ...									
<b>Total</b>			<b>[5]</b>							

Question		Answer	Mark	Guidance			
2	a	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>ultraviolet</td> <td>X-ray</td> <td>gamma ray</td> </tr> </table>	ultraviolet	X-ray	gamma ray	1	any unambiguous response in the correct box
ultraviolet	X-ray	gamma ray					
	b	speed (1) space (1)	2	<b>accept</b> 'vacuum' instead of 'space'			
	c	tooth absorbs X-rays (1)  film changes colour when absorbs X-rays / film white where X-rays do not reach it / black where X-rays reach it (1)	2	<b>accept</b> X-rays don't get through the tooth <b>accept</b> different parts of the tooth absorb X-rays differently  <b>accept</b> tooth forms a shadow on the film			
<b>Total</b>			<b>[5]</b>				
3	a	one and zero (1)	1	not one on its own, not zero on its own			
	b	modulation (1) noise (1) sound (1)	3				
<b>Total</b>			<b>[4]</b>				

Question		Answer	Mark	Guidance
4	a	Niall (1) Beth (1)	2	<b>accept</b> in either order <b>accept</b> any clear indication of correct response
	b	language / talking / intelligence / consciousness / thinking / processing information (1)	1	apply list principle <b>accept</b> otte <b>reject</b> personality / owtte <b>reject</b> memory
	c	electrical stimulation (of the brain) / electroencephalogram (EEG) / magnetic resonance imaging (MRI scans) / functional magnetic resonance imaging (fMRI scans) / positron emission tomography (PET scans) / (radioactive) tracers / studies of patients with traumatic brain damage (1)	1	<b>not</b> CAT scans / X-rays / brain scans / ECG / dissection  <b>not</b> decay e.g. not Alzheimer's
<b>Total</b>			<b>[4]</b>	
5	a	spinal cord (1) sensory (1) synapses (1)	3	
	b	i	<b>C</b> - axon (1)	1
		ii	<b>D</b> - fatty sheath (1)	1
	c	<b>any three from:</b> receptor detects stimulus; (electrical) impulse; correct sequence of receptor, sensory neuron, motor neuron, effector; effector makes the movement;	3	<b>accept</b> nervous impulses <b>accept</b> signals <b>reject</b> sequence which includes brain
	<b>Total</b>			<b>[8]</b>
6		a stimulus (1) dealing with a new situation (1)	2	
<b>Total</b>			<b>[2]</b>	

Question		Answer	Mark	Guidance	
7		particles smaller (1) rate faster (1)	2	this is the <b>minimum</b> acceptable response <b>accept</b> higher level answers e.g. correct reference to surface area	
<b>Total</b>			<b>[2]</b>		
8	a	calcium + hydrochloric → calcium + carbon + water carbonate            acid            chloride            dioxide	1	the two reactants can be in either order the three products can be in any order	
	b	calcium chloride (1)	1		
	c	i	1 (1)	1	
		ii	<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="width: 60%;"> <p style="margin-left: 40px;"><input type="checkbox"/></p> <p style="margin-left: 40px;">universal indicator <input checked="" type="checkbox"/></p> <p style="margin-left: 40px;">pH meter <input checked="" type="checkbox"/></p> <p style="margin-left: 40px;"><input type="checkbox"/></p> </div> <div style="width: 35%; text-align: center;"> <p><input type="checkbox"/></p> <p><input checked="" type="checkbox"/></p> <p><input checked="" type="checkbox"/></p> <p><input type="checkbox"/></p> </div> </div>	1	both correct for 1 mark
	d	7 (1)	1		
<b>Total</b>			<b>[5]</b>		

Question		Answer	Mark	Guidance
9	a	l, g, s, g	1	in that order do not penalise use of capitals
	b	impurities are solid / separate / as a mixture / not bonded to reactants (1) filtering / decanting / evaporating / distilling (1) after reaction 1 / before reaction 2 / while is liquid titanium chloride (1)	3	<b>reject</b> filtering if impurity is liquid <b>reject</b> distilling/evaporating of solid impurity look for a separation method that makes physical sense
	c	$\frac{210 \times 100}{300} \quad (1)$	1	
	d		2	one mark for each correct response
<b>Total</b>			<b>[7]</b>	

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