



GCSE

Additional Science A

General Certificate of Secondary Education

Unit **A217/02**: Modules B6, C6, P6 (Higher Tier)

Mark Scheme for June 2011

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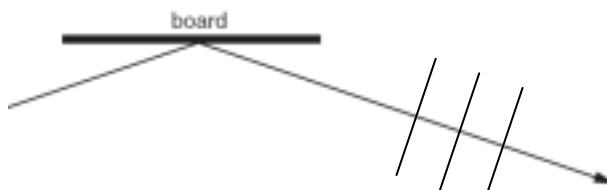
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Mark Scheme

June 2011

Question		Answer	Mark	Guidance
1	a	one and zero (1)	1	not one on its own or zero on its own
	b	modulation (1) noise (1) sound (1)	3	
Total		[4]		

2	a	<p>... out of step with the direct wave</p> <p><input type="checkbox"/> (1)</p>	1	
	b		1	<p>look for</p> <ul style="list-style-type: none"> • three lines on the right • with same (or almost same) spacing as the ones on the left • at right angles (or almost) to the ray <p>three lines can be anywhere along the ray</p> <p>accept any length for the lines</p> <p>accept lines of different length</p>
	c	0.5 m (1)	1	
	d	distance (1) from a crest/trough to the next one (1)	2	<p>not length on its own</p> <p>ignore wave</p> <p>from a named point to the next named point (could be peak, trough, crest, compression, rarefaction, top, bottom, etc)</p>
Total		[5]		

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Question		Answer	Mark	Guidance
3	a	<input type="checkbox"/> infrared <input type="checkbox"/> visible <input checked="" type="checkbox"/> ultraviolet <input type="checkbox"/> X-rays	1	needs both correct for 1 mark accept IR and UV ignore contents of all other boxes
	b	all travel through (empty) space / vacuum (1) with the <u>same</u> speed / at speed of light / at 300 000 km/s (1)	2	accept transverse wave for 1 mark if no other marks awarded accept correct value of speed in other units eg 671 million mph ignore references to photons, electric fields and magnetic fields
	c	... X-rays arriving at the film. <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> (1) <input type="checkbox"/> <input type="checkbox"/>	1	
	d	(packets of) energy / momentum (1)	1	allow information
		Total	[5]	

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Question		Answer	Mark	Guidance
4	a	Niall (1) Beth (1)	2	accept in either order
	b	language / talking / speech / consciousness / thinking / intelligence / processing information / owtte (1)	1	apply list principle not personality / owtte not memory
	c	electrical stimulation (of the brain) / electro encephalogram/EEG (scan) / functional magnetic resonance imaging fMRI / MRI / positron electron tomography PET (scan) / radioactive (tracer) / studies of patients with traumatic brain damage (1)	1	not CAT scans / X-rays / brain scans / ECG / dissection / electrocution accept (small) electric shocks not Alzheimer's, disease, decay etc
	d	description of any two techniques for 1 mark each: association with a stimulus e.g. sound, colour, smell, past event; repetition; chunking; mnemonic/story/rhyme; clear explanation of how a technique works e.g. strengthening neural pathways, involvement of many different brain areas, limiting working space memory between 5 and 9 ...	3	accept selecting a password which is easy to remember ignore patterns as a technique look for clear, high quality answer for the third mark
		Total	[7]	

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Question		Answer	Mark	Guidance
5	a	conditioned; secondary; has no; billions;	3	4 correct = 3 marks 3 correct = 2 marks 2 correct = 1 mark
	b	<p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p>New pathways linking neurons ... <input checked="" type="checkbox"/> (1)</p> <p>Repeating a stimulus makes ... <input checked="" type="checkbox"/> (1)</p> <p><input type="checkbox"/></p>	2	correct pattern for 2 marks one mistake for 1 mark
		Total	[5]	

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Question		Answer	Mark	Guidance
7	a	l, g, s, g (1)	1	in that order do not penalise use of capitals not words instead of symbols
	b	impurity is solid / separate / a mixture / not bonded to reactants (1) filtering / decanting / distilling / evaporating (1) after reaction 1 / before reaction 2 / while liquid TiCl_4 (1)	3	reject filtering if impurity is liquid reject distilling / evaporation of the solid impurity look for separation technique which makes physical sense
	c	speeds up the reaction / reduces activation energy without being used up (1)	1	look for complete answer reject without taking part in reaction ignore explanations of catalyst action
	d	EITHER $2\text{H}_2\text{O} \rightarrow 2\text{H}_2 + \text{O}_2$ OR $2\text{H}_2\text{O} \rightarrow \text{O}_2 + 2\text{H}_2$	2	look for clear subscripts and capitals ignore any words $\text{?H}_2\text{O} \rightarrow \text{?H}_2 + \text{?O}_2$ for 1 mark where ? is any number $\text{?H}_2\text{O} \rightarrow \text{?O}_2 + \text{?H}_2$ for 1 mark where ? is any number $2\text{H}_2\text{O} \rightarrow 2\text{H}_2 + \text{O}_2$ for 2 marks
		Total	[7]	

8		increases surface area of flour (1) increases chance of (successful) collisions with (oxygen) particles (1)	2	reject moves faster / more energy
		Total	[2]	

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Question		Answer	Mark	Guidance
9	a	calcium + hydrochloric \rightarrow calcium + carbon + water carbonate acid chloride dioxide	1	the two reactants on the left can be in either order the three products on the right can be in any order look for correct spellings ignore chemical formulae
	b	i pH does not increase <input checked="" type="checkbox"/> (1) <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	1	
		ii question removed		enter NR
	c	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Hydrochloric acid is a solution ... <input checked="" type="checkbox"/> (1)	1	
	d	NO_3^- (1)	1	
		Total	[4]	

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