

Additional Science A

General Certificate of Secondary Education **A217/02**

Unit 3: Modules B6, C6, P6 (Foundation Tier)

Mark Scheme for June 2010

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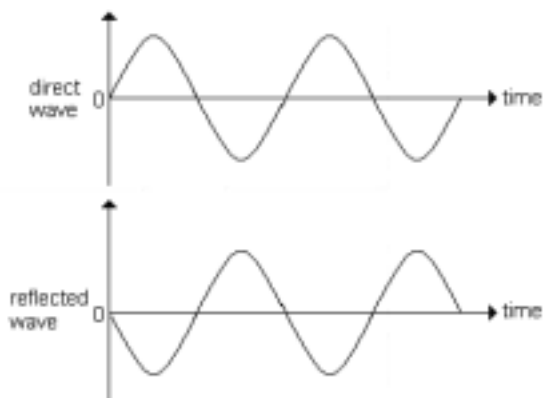
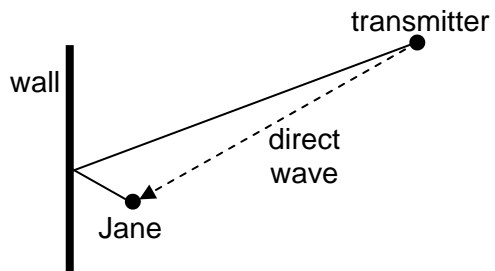
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Question		Expected Answers	Marks	Additional Guidance
1	a	300 m/s (1)	[1]	
	b		[2]	correct pattern = 2 marks one or two mistakes = 1 mark a mistake is a missing line or a line in the wrong place
	c	decreases stays the same	[1]	accept gets smaller / reduces (owtte) accept remains constant / doesn't change (owtte) both required for the mark
Total			[4]	

Question		Expected Answers	Marks	Additional Guidance
2	a	digital modulate noise pulses	[2]	all four correct = 2 marks any two or three correct = 1 mark
	b	i	[1]	look for straight line from transmitter to wall, then straight line from wall to Jane with equal angles of incidence and reflection on or between red and green lines of template no breaks in the line from transmitter to Jane not freehand lines ignore arrows
		ii	[1]	look for one whole cycle of the wave in antiphase accept any amplitude must cross zero on or between lines of template



Question			Expected Answers	Marks	Additional Guidance
2	b	iii	<p>Waves which arrive in step ...</p> <p>There is an interference pattern ...</p>	[1]	correct pattern = 1 mark
			Total	[5]	

Question		Expected Answers	Marks	Additional Guidance
3	a	<div style="display: flex; flex-wrap: wrap;"> <div style="border: 1px solid black; padding: 2px; margin: 2px;">The light does not ...</div> <div style="border: 1px solid black; padding: 2px; margin: 2px;">... enters and leaves ...</div> <div style="border: 1px solid black; padding: 2px; margin: 2px;">The light slows ...</div> <div style="border: 1px solid black; padding: 2px; margin: 2px;">... reflects off the glass.</div> <div style="border: 1px solid black; padding: 2px; margin: 2px;">The light speeds ...</div> <div style="border: 1px solid black; padding: 2px; margin: 2px;">... enters the glass.</div> <div style="border: 1px solid black; padding: 2px; margin: 2px;">The light refracts ...</div> <div style="border: 1px solid black; padding: 2px; margin: 2px;">... leaves the glass.</div> </div>	[2]	correct pattern = 2 marks one or two mistakes = 1 mark a mistake is <ul style="list-style-type: none"> • a line in the wrong place • a missing line
	b	any two from: speed decreases; wavelength decreases; frequency remains unchanged;	[2]	no ecf from incorrect speed change all marking points are independent
	c	<div style="border: 1px solid black; padding: 5px; display: flex; align-items: center; gap: 10px;"> <div style="border: 1px solid black; padding: 2px;">radio</div> <div style="background-color: #cccccc; width: 20px; height: 20px;"></div> <div style="background-color: #cccccc; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; padding: 2px;">(visible) light</div> <div style="background-color: #cccccc; width: 20px; height: 20px;"></div> <div style="background-color: #cccccc; width: 20px; height: 20px;"></div> <div style="border: 1px solid black; padding: 2px;">gamma</div> </div>	[1]	all three correct =- 1 mark accept visible or light on its own ignore TV accept γ instead of gamma ignore rays or photons
Total			[5]	
4	a	removing impurities is expensive / impure acid is cheaper (1) impurities do not stop acid doing the job (1)	[2]	not acid becomes impure as it is used ignore references to strength of acid
	b	use a probe/meter and look for reading/number (1) use paper/indicator and look for colour (1)	[2]	accept universal/litmus/Ui/pH in any order must have both device and observation for each mark
Total			[4]	

Question		Expected Answers			Marks	Additional Guidance	
5						[4]	all six correct = 4 marks five correct = 3 marks four correct = 2 marks three correct = 1 mark lose 1 mark for each mistake
			student	experiment 1	experiment 2		
			Arthur	B	A		
			Ben	B	C		
			Chet	B	A		
Total					[4]		
6	a		Mg(OH) ₂ NaOH			[1]	both required for the mark
	b		sodium nitrate carbon dioxide water			[2]	all three correct = 2 marks two or one correct = 1 mark accept CO ₂ for carbon dioxide accept H ₂ O for water accept NaNO ₃ for sodium nitrate
	c		$\text{CuO} + 2\text{HCl} \longrightarrow \text{CuCl}_2 + \text{H}_2\text{O}$ correct formulae for chemicals before arrow (1) correct formulae for chemicals after arrow (1) 2 in front of HCl with rest of equation correct (1)			[3]	subscript must be at least half of full character size u in Cu and l in Cl must look lower case ignore state symbols eg (aq)
Total					[6]		

Question		Expected Answers	Marks	Additional Guidance
7	a	retrieval storage	[1]	both required for 1 mark
	b	billions experience transmit	[2]	all three correct = 2 marks two or one correct = 1 mark
	c	<div style="text-align: right;"> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> The variety of potential pathways ... <input checked="" type="checkbox"/> (1) </div>	[1]	
Total			[4]	

Question			Expected Answers	Marks	Additional Guidance
8	a	i	<pre> graph LR subgraph Stimuli PS[primary stimulus] SS[secondary stimulus] end subgraph Responses R[response] end subgraph Outcomes P1[puppy eats food] P2[puppy barks] P3[puppy produces saliva] P4[smell of food] P5[sound of bell] end PS --- P3 SS --- P4 SS --- P5 R --- P1 R --- P2 </pre>	[2]	correct pattern of lines = 2 marks one or two mistakes = 1 mark a mistake is <ul style="list-style-type: none"> • a missing line • an extra line • a line in the wrong place
	a	ii	<p>... has no direct connection ...</p> <p style="text-align: right;"> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> (1) <input type="checkbox"/> </p>	[1]	

Question		Expected Answers	Marks	Additional Guidance					
8	b	disadvantage: difficult to respond to new situations (1) advantages: any two from: aids survival; helps to find food; helps to find a mate; speeds up response; involuntary;	[3]	accept cannot learn new response accept cannot adapt / change response accept avoid danger / predators accept get away quicker accept no need to think / choose response must have one disadvantage and two advantages for 3 marks					
		Total	[6]						
9		<div style="border: 1px solid black; display: inline-block; padding: 2px; margin-bottom: 10px;"> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr> <td style="width: 20px; height: 20px;">E</td> <td style="width: 20px; height: 20px;">B</td> <td style="width: 20px; height: 20px;">C</td> <td style="width: 20px; height: 20px;">J</td> <td style="width: 20px; height: 20px;">G</td> </tr> </table> </div> first box E (1) last box G (1) B before C (1) C before J (1)	E	B	C	J	G	[4]	
E	B	C	J	G					
		Total	[4]						

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