OCR
RECOGNISING ACHIEVEMENT

GCSE

Additional Science A

General Certificate of Secondary Education

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

Mark Scheme for January 2012

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This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which marks were awarded by examiners. It does not indicate the details of the discussions which took place at an examiners' meeting before marking commenced.

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.

OCR will not enter into any discussion or correspondence in connection with this mark scheme.

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Annotations

Annotation	Meaning
/	alternative and acceptable answers for the same marking point
(1)	separates marking points
not/reject	answers which are not worthy of credit
ignore	statements which are irrelevant - applies to neutral answers
allow/accept	answers that can be accepted
(words)	words which are not essential to gain credit
words	underlined words must be present in answer to score a mark
ecf	error carried forward
AW/owtte	alternative wording
ORA	or reverse argument

Available in scoris to annotate scripts

Annotation	Meaning
	indicate uncertainty or ambiguity
	benefit of doubt
	contradiction
	incorrect response
	error carried forward
	draw attention to particular part of candidate's response
	draw attention to particular part of candidate's response
	draw attention to particular part of candidate's response
	no benefit of doubt

Annotation	Meaning
	reject
	correct response
	draw attention to particular part of candidate's response
	information omitted

Subject-specific Marking Instructions

a. If a candidate alters his/her response, examiners should accept the alteration.

b. Crossed out answers should be considered only if no other response has been made. When marking crossed out responses, accept correct answers which are clear and unambiguous.

E.g.

For a one mark question, where ticks in boxes 3 and 4 are required for the mark:

Put ticks (✓) in the two correct boxes.

This would be worth 1 mark.

Put ticks (✓) in the two correct boxes.

This would be worth 0 marks.

Put ticks (✓) in the two correct boxes.

This would be worth 1 mark.

c. The list principle:
If a list of responses greater than the number requested is given, work through the list from the beginning. Award one mark for each correct response, ignore any neutral response, and deduct one mark for any incorrect response, e.g. one which has an error of science. If the number of incorrect responses is equal to or greater than the number of correct responses, no marks are awarded. A neutral response is correct but irrelevant to the question.

d. Marking method for tick boxes:

Always check the additional guidance.

If there is a set of boxes, some of which should be ticked and others left empty, then judge the entire set of boxes.
If there is at least one tick, ignore crosses. If there are no ticks, accept clear, unambiguous indications, e.g. shading or crosses.
Credit should be given for each box correctly ticked. If more boxes are ticked than there are correct answers, then deduct one mark for each additional tick. Candidates cannot score less than zero marks.

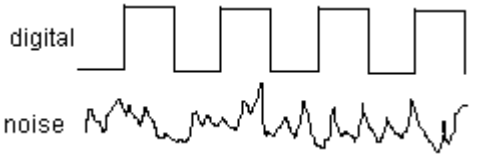
E.g. If a question requires candidates to identify a city in England, then in the boxes

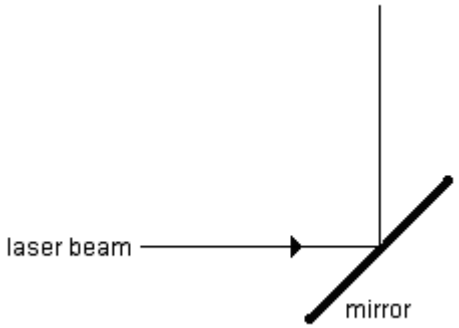
Edinburgh	
Manchester	
Paris	
Southampton	

the second and fourth boxes should have ticks (or other clear indication of choice) and the first and third <u>should be blank</u> (or have indication of choice crossed out).

Edinburgh			✓			✓	✓	✓	✓	
Manchester	✓	×	✓	✓	✓				✓	
Paris				✓	✓		✓	✓	✓	
Southampton	✓	×		✓		✓	✓		✓	
Score:	2	2	1	1	1	1	0	0	0	NR

Question			Answers	Marks	Guidance
1	(a)		energy	1	
	(b)		680 340 0.5	2	all correct for [2] one or two correct [1]
	(c)		The wall attracts the sound waves. ☐ The sound waves are amplified by the wall. ☐ The gap in the wall absorbs the sound waves. ☐ The sound waves diffract as they go through the gap. ✓	1	
	(d)		speed	1	
			Total	**5**	

Question			Answers	Marks	Guidance
2	(a)		infrared light	1	
	(b)		description of digital; • on or off / square wave / 1 or 0 / pulses description of noise; • random signal / wave picked up in the cable / signal with no information / interference. digital signal can be cleaned up (at the receiver); OR noise is not picked up by optical fibres / difficult for noise to get into the optical fibre signal.	3	**accept** diagrams instead of descriptions 
			Total	**4**	

Question			Answers	Marks	Guidance
3	(a)		speed / velocity	1	**accept** polarisation / colour / phase / mass **ignore** amplitude
	(b)		Intensity is the speed of each photon. ☐ Intensity is the energy arriving per second. ☑ Intensity is the number of photons in the beam. ☐ Intensity is the amplitude of each photon in the beam. ☐	1	
	(c)		frequency	1	
	(d)			1	look for straight line continued until it meets the mirror, then straight line up the page (as shown) up to 30^0 either side of the correct line, SCORIS template. roughly straight line by eye. (does not have to be drawn by a ruler)
	(e)		interference	1	
			Total	**5**	

Question			Answers	Marks	Guidance
4	(a)		**(A) C E B D**	3	**C** anywhere before **E** = 1 mark **E** anywhere before **B** = 1 mark **B** anywhere before **D** = 1 mark
	(b)		<table><tr><td>… give fast responses.</td><td>✓</td></tr><tr><td>… only happens in adults.</td><td></td></tr><tr><td>… are involuntary.</td><td>✓</td></tr><tr><td>… do not need any change in the environment</td><td></td></tr><tr><td>… are only found in humans.</td><td></td></tr></table>	2	
			Total	**5**	

Question			Answers	Marks	Guidance
5			**1 mark** for job: intelligence/memory/language/consciousness; **1 mark** for mapping by: MRI scans/electrical stimulation of brain/studies of patients with brain damage; **1 mark** for detail of experiment / test linking mapping to job	3	**accept** movement
			Total	**3**	

Question			Answers	Marks	Guidance
6	(a)		40%	1	
	(b)		dark	1	
	(c)		<table><tr><td>it helps to protect them from birds</td><td>✓</td></tr><tr><td>it allows them to respond to new conditions</td><td></td></tr><tr><td>it helps them to investigate different habitats</td><td></td></tr><tr><td>it prevents the Sun from drying them out</td><td>✓</td></tr><tr><td>it allows them to make food</td><td></td></tr><tr><td>it helps them to avoid competition</td><td></td></tr></table>	2	
			Total	**4**	

Question			Answers	Marks	Guidance
7	(a)		Maria	1	
	(b)		Rick	1	
			Total	**2**	

Question			Answers	Marks	Guidance
8	(a)		**How (1)** mass of reactants is greater than mass of ibuprofen ORA; **Why – any 2 max** (reaction 1) produces other products / by products are formed; (reaction 2) other (different) substances are formed / does not produce ibuprofen; actual yield lower than theoretical yield / may not go to completion / some material is left behind at a purification stage;	3	**allow** may not have 100% reaction
	(b)	(i)	**10% 11.1% 45% 80% (90%)**	1	
		(ii)	(4500 / 5000) x 100	1	**allow** equation given in words: actual yield/theoretical yield x 100
			Total	**5**	

Question			Answers	Marks	Guidance
9	(a)		lead iodide lead nitrate potassium iodide ✓ potassium nitrate ✓	**1**	
	(b)		10 (cm^3)	**1**	
	(c)		filter wash it (with water) dry in an oven or desiccator	**3**	 **ignore** ideas of evaporation and crystallisation
			Total	**5**	

<table>
<tr><th colspan="3">Question</th><th>Answers</th><th>Marks</th><th>Guidance</th></tr>
<tr><td>10</td><td>(a)</td><td></td><td>HCl</td><td>1</td><td></td></tr>
<tr><td></td><td>(b)</td><td></td><td><table><tr><td>A salt is made.</td><td>✓</td></tr><tr><td>Water is made.</td><td>✓</td></tr><tr><td>There is an explosion.</td><td></td></tr><tr><td>A carbonate is produced.</td><td></td></tr><tr><td>An indicator is produced.</td><td></td></tr></table></td><td>1</td><td></td></tr>
<tr><td></td><td>(c)</td><td></td><td>1 4 6 7 14 (14 circled)</td><td>1</td><td></td></tr>
<tr><td></td><td>(d)</td><td></td><td>H^+ Cl^- Na^+ OH (OH circled)</td><td>1</td><td></td></tr>
<tr><td></td><td></td><td></td><td>Total</td><td>4</td><td></td></tr>
</table>

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