

GCSE

Additional Applied Science

Unit **A191/01**: Science in Society (Foundation Tier)

General Certificate of Secondary Education

Mark Scheme for June 2017

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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

Used in the detailed Mark Scheme:

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

E.g. mark scheme shows 'work done in lifting / (change in) gravitational potential energy' (1)














work done = 0 marks

work done lifting = 1 mark

change in potential energy = 0 marks

gravitational potential energy = 1 mark

Available in RM Assessor to annotate scripts

	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
	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.

<input type="checkbox"/>
<input type="checkbox"/>
<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>
<input type="checkbox"/>

This would be worth 1 mark.

Put ticks (✓) in the two correct boxes.

<input type="checkbox"/>
<input type="checkbox"/>
<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>
<input type="checkbox"/>

This would be worth 0 marks.

Put ticks (✓) in the two correct boxes.

<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>
<input type="checkbox"/>

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 should be blank (or have indication of choice crossed out).

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

Question	Expected Answers	Marks	Additional Guidance												
1 a	<table border="1"> <thead> <tr> <th data-bbox="374 240 562 276">response</th> <th data-bbox="562 240 1088 276">explanation</th> </tr> </thead> <tbody> <tr> <td data-bbox="405 304 562 411"> <div style="border: 1px solid black; padding: 5px; width: fit-content;">triage</div> </td> <td data-bbox="669 304 1039 411"> <div style="border: 1px solid black; padding: 5px;">Make notes about previous medical conditions and lifestyle.</div> </td> </tr> <tr> <td data-bbox="405 443 562 515"> <div style="border: 1px solid black; padding: 5px; width: fit-content;">history</div> </td> <td data-bbox="669 443 1039 515"> <div style="border: 1px solid black; padding: 5px;">Find out what is wrong with the patient</div> </td> </tr> <tr> <td data-bbox="405 547 562 651"> <div style="border: 1px solid black; padding: 5px; width: fit-content;">diagnosis</div> </td> <td data-bbox="669 547 1039 651"> <div style="border: 1px solid black; padding: 5px;">Prioritise patients so those in a critical condition get treated first.</div> </td> </tr> <tr> <td data-bbox="405 683 562 786"> <div style="border: 1px solid black; padding: 5px; width: fit-content;">treatment</div> </td> <td data-bbox="669 683 1039 786"> <div style="border: 1px solid black; padding: 5px;">Give medical care to combat the disease or disorder.</div> </td> </tr> </tbody> </table>	response	explanation	<div style="border: 1px solid black; padding: 5px; width: fit-content;">triage</div>	<div style="border: 1px solid black; padding: 5px;">Make notes about previous medical conditions and lifestyle.</div>	<div style="border: 1px solid black; padding: 5px; width: fit-content;">history</div>	<div style="border: 1px solid black; padding: 5px;">Find out what is wrong with the patient</div>	<div style="border: 1px solid black; padding: 5px; width: fit-content;">diagnosis</div>	<div style="border: 1px solid black; padding: 5px;">Prioritise patients so those in a critical condition get treated first.</div>	<div style="border: 1px solid black; padding: 5px; width: fit-content;">treatment</div>	<div style="border: 1px solid black; padding: 5px;">Give medical care to combat the disease or disorder.</div>	2	4 correct lines = 2 marks 2 or 3 correct lines = 1 mark 1 correct line = 0		
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	b	2	Minus 1 mark for each additional incorrect tick. Candidate cannot score less than zero.												
<table border="1"> <tbody> <tr> <td data-bbox="387 836 981 898">...what the treatment involves.</td> <td data-bbox="981 836 1088 898" style="text-align: center;">✓</td> </tr> <tr> <td data-bbox="387 898 981 960">...the cost of the treatment.</td> <td data-bbox="981 898 1088 960"></td> </tr> <tr> <td data-bbox="387 960 981 1023">...the doctors and nurses who will be involved in the treatment.</td> <td data-bbox="981 960 1088 1023"></td> </tr> <tr> <td data-bbox="387 1023 981 1085">...how long the treatment will take.</td> <td data-bbox="981 1023 1088 1085"></td> </tr> <tr> <td data-bbox="387 1085 981 1147">...where the treatment will take place.</td> <td data-bbox="981 1085 1088 1147"></td> </tr> <tr> <td data-bbox="387 1147 981 1241">...the risks and benefits of the treatment.</td> <td data-bbox="981 1147 1088 1241" style="text-align: center;">✓</td> </tr> </tbody> </table>		...what the treatment involves.	✓	...the cost of the treatment.		...the doctors and nurses who will be involved in the treatment.		...how long the treatment will take.		...where the treatment will take place.		...the risks and benefits of the treatment.	✓		
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...the risks and benefits of the treatment.	✓														

c				2	Minus 1 mark for each additional incorrect tick. Candidate cannot score less than zero.
		There are more GPs than specialist services.			
		GPs are trained to treat all conditions.			
		GPs need to be able to identify what is wrong with a patient and how best to treat the condition.			
		Specialist services can treat more complicated conditions.	✓		
		It would be too expensive to provide all GPs with equipment such as MRI scanners.	✓		
	There are more specialist services than GPs.				
Total				[6]	

Question	Expected Answers	Marks	Additional Guidance
2	<p>[Level 3] Good description of both role and skills. Quality of written communication does not impede communication of the science at this level. (5 – 6 marks)</p> <p>[Level 2] Some description of role and some description of skills OR Detailed description of skill OR detailed description of role. Quality of written communication partly impedes communication of the science at this level. (3 – 4 marks)</p> <p>[Level 1] Practitioner identified with some description of roles. Quality of written communication impedes communication of the science at this level. (1 – 2 marks)</p> <p>[Level 0] Insufficient or irrelevant science. Answer not worthy of credit. (0 marks)</p>	6	<p>This question is targeted at grades up to E</p> <p>Role may include depending upon example e.g. doctor:</p> <ul style="list-style-type: none"> • diagnosis/identify patterns/what is wrong • examples of diagnosis • treatment/care of patient • examples of treatment/medication <p>Skills may include:</p> <ul style="list-style-type: none"> • good medical knowledge/qualifications • good diagnostician • good at determining best / most effective treatment • good bedside manner • good communicator / good listener / asks the right questions • good teamwork • detached but good personal relationship with patient/empathy • good professional relationship (with colleagues) • confident <p>Examples of practitioners may include:</p> <ul style="list-style-type: none"> • doctor • nurse • dentist • midwife • optician • physiotherapist • nutritionist <p>Use the L1, L2, L3 annotations in RM Assessor; do not use ticks.</p>
	Total	[6]	

Question		Expected Answers	Marks	Additional Guidance
3	a	<p>Any 3 from:</p> <p>Bone is broken;</p> <p>Other bone not broken;</p> <p>Idea of bone displaced;</p> <p>Not a compound fracture/has not pierced the skin;</p> <p>Only one break in the bone;</p>	3	<p>'Only one bone is broken' subsumes MPs 1 and 2 so is 2 marks. Ignore names of bones/reference to ligaments.</p> <p>If no other marks scored allow 'leg is broken' for 1 mark.</p>
	b	<p>Any 2 from:</p> <p>Assess injury;</p> <p>Devise exercises; to aid recovery/strengthen muscles;</p> <p>Develop programme/monitor progress;</p>	2	
Total			[5]	

Question		Expected Answers	Marks	Additional Guidance
4	a	<p>Any 3 from:</p> <p>Shake thermometer to lower mercury level;</p> <p>Place thermometer in suitable position e.g. under tongue / arm / mouth;</p> <p>Leave for suitable time then take reading;</p> <p>Idea of sterilising thermometer before use with next patient e.g. place in alcohol/antiseptic</p>	3	<p>Ignore forehead / ear</p> <p>accept sterilise before using on this patient</p>
	b	<p>Any 2 from:</p> <p>temperature is 35°C;</p> <p>Lower than normal;</p> <p>Consequence e.g. serious / needs warming / keep warm / hypothermia;</p>	2	
	c	<p>Liquid crystal;</p> <p>Idea of digital rather than analogue/ Only gives a whole number/doesn't give a decimal;</p> <p>Idea of less range between readings so less accurate;</p>	3	
Total			[8]	

Question	Expected Answers	Marks	Additional Guidance
5	<p>[Level 3] Comments on conclusion, suggests improvements including some explanation. Quality of written communication does not impede communication of the science at this level. (5 – 6 marks)</p> <p>[Level 2] Comments on the conclusion and suggests improvements. Quality of written communication partly impedes communication of the science at this level. (3 – 4 marks)</p> <p>[Level 1] Comments on the conclusion or suggests improvement. Quality of written communication impedes communication of the science at this level. (1 – 2 marks)</p> <p>[Level 0] Insufficient or irrelevant science. Answer not worthy of credit. (0 marks)</p>	6	<p>This question is targeted at grades up to C</p> <p>Conclusion:</p> <ul style="list-style-type: none"> • (yes) it does contain posh pink • but also contains daffodil yellow • so only partially correct • contains other dyes <p>Improvements:</p> <ul style="list-style-type: none"> • use more known dyes • use different solvents • 2 way chromatography • work out Rf values • ensure tank sealed • use different type of chromatography <p>Explanation of improvements may include:</p> <ul style="list-style-type: none"> • as not all dyes have been identified/identify the unknowns/idea of comparison needed • better separation • separate even more dyes. • so can look up Rfs of unknowns • prevent evaporation <p>Use the L1, L2, L3 annotations in RM Assessor; do not use ticks.</p>
	Total	[6]	

Question		Expected Answers	Marks	Additional Guidance
6	a	<p>Any 2 from: Idea of strenuous activity means inhaling (greater volume of) polluted air / pollutants Air is more polluted outside than indoors; Idea that people with breathing problems are at greater risk/ wont be able to breathe normally</p>	2	
	b	i	1	accept 6am
		ii	1	accept cars / traffic idea
		iii	1	<p>Any 1 from: Idea that they should try to avoid rush-hour; Wear masks;</p> <p>accept 8.00 - 12.00am / 5.00 – 6.00pm accept not at busy times</p>
		Total	[5]	

Question	Expected Answers	Marks	Additional Guidance
7	<p>[Level 3] Includes most methods AND most details AND most reasons. Quality of written communication does not impede communication of the science at this level. (5 – 6 marks)</p> <p>[Level 2] Includes most method AND some details and some reasons. OR Includes most methods AND most details OR most reasons. Quality of written communication partly impedes communication of the science at this level. (3 – 4 marks)</p> <p>[Level 1] Includes some methods. Quality of written communication impedes communication of the science at this level. (1 – 2 marks)</p> <p>[Level 0] Insufficient or irrelevant science. Answer not worthy of credit. (0 marks)</p>	6	<p>This question is targeted at grades up to C</p> <p>Method may include:</p> <ul style="list-style-type: none"> • collect blood from different parts of crime scene • use swabs/cotton swabs/cotton buds • label samples • seal bags • get samples to lab ASAP • storage details • wear gloves <p>Detail may also include for example:</p> <ul style="list-style-type: none"> • use sterile collecting bags • prevent deterioration of samples • avoid contamination samples • avoid tampering with samples • samples are representative <p>Reason may also include for example:</p> <ul style="list-style-type: none"> • to ensure all the available evidence is collected • to ensure record is kept at which part of crime scene they were collected from and when • because deterioration will destroy evidence • because contamination will destroy evidence • prevent evidence being changed <p>Use the L1, L2, L3 annotations in RM Assessor; do not use ticks.</p>
	Total	[6]	

Question		Expected Answers	Marks	Additional Guidance	
8	a	Electrophoresis uses colour to identify substances.	2	Minus 1 mark for each additional incorrect response. Candidate cannot score less than zero.	
		Electrophoresis uses a scanning electron microscope.			
		Electrophoresis can be used on small biological samples.			✓
		Electrophoresis can separate biological molecules.			✓
		Electrophoresis measures the intensity of a colour.			
	b	i	Idea of using known and unknown samples; Compares bands; idea of the one with identical bands and positions is the suspect/matches the suspect.	3	accept indication on chart that samples 3 & 6 match
		ii	Take sample of tissue from both male horses/DNA tests on both horses; Take sample from baby horse/DNA test from baby horse; Compare DNA samples/ find out which matches;	3	accept takes samples from the horses for 1 mark
			Total	[8]	
			Paper total	50	

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