OCR
Oxford Cambridge and RSA

GCSE

Further Additional Science B

Unit **B761/01:** Modules B5, C5, P5 (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.

Annotations used in scoris

Annotation	Meaning
	correct response
	incorrect response
	benefit of the doubt
	benefit of the doubt **not** given
	error carried forward
	information omitted
	ignore
	reject
	contradiction

Abbreviations, annotations and conventions used in the detailed Mark Scheme.

/ = alternative and acceptable answers for the same marking point
(1) = separates marking points
allow = answers that can be accepted
not = answers which are not worthy of credit
reject = answers which are not worthy of credit
ignore = statements which are irrelevant
( ) = words which are not essential to gain credit
__ = underlined words must be present in answer to score a mark (although not correctly spelt unless otherwise stated)
ecf = error carried forward
AW = alternative wording
ora = or reverse argument

MARK SCHEME

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th><th>Guidance</th></tr>
<tr><td>1 a</td><td>
<table>
<tr><th>Replacement body part</th><th>Biological</th><th>Mechanical</th><th>Inside body</th><th>Outside body</th></tr>
<tr><td>blood donation</td><td>(✓)</td><td></td><td>(✓)</td><td></td></tr>
<tr><td>artificial heart valve</td><td></td><td>✓</td><td>✓</td><td></td></tr>
<tr><td>heart and lung machine</td><td></td><td>✓</td><td></td><td>✓</td></tr>
<tr><td>kidney dialysis machine</td><td></td><td>✓</td><td></td><td>✓</td></tr>
<tr><td>ovary transplant</td><td>✓</td><td></td><td>✓</td><td></td></tr>
</table>
(1)
(1)
(1)
(1)
</td><td>4</td><td>1 mark for each correct line
ignore 1st row of table (answer given in question)</td></tr>
<tr><td>b</td><td>any one from
during an operation (1)

treat haemophiliac / sickle cell anaemia / other named inherited disorders (1)

blood loss from injury (1)

treat anaemia (1)</td><td>1</td><td>ignore references to during childbirth

allow leukaemia / blood disease/disorder (1)

ignore just from an accident

allow lack of blood in body (1)</td></tr>
<tr><td></td><td>Total</td><td>5</td><td></td></tr>
</table>

Question	Answer	Marks	Guidance
2 a	adolescence (1)	1	**allow** answer underlined or ticked more than one answer= 0
b	idea that the line for Amy rises above Tom's line in the middle of the graph (1) idea that the line for Amy is lower than Tom's at the end (1) correct use of data from graph (1)	3	**ignore** ideas of similarities in the first 10 years **allow** correct identification of one range (1) **allow** Amy's line is above Tom's in the range 10-15 years (2) (any numbers within the range)
c	David (1) the graph shows mass (not height) (1)	2	
	Total	**6**	

Question	Answer	Marks	Guidance
3 a	**[Level 3]** Describes one difference **AND** two similarities **OR** describes two differences **AND** one similarity. Quality of written communication does not impede communication of the science at this level. (5 – 6 marks) **[Level 2]** Describes one difference **AND** one similarity. **OR** describes two differences **OR** describes two similarities Quality of written communication partly impedes communication of the science at this level. (3 – 4 marks) **[Level 1]** Describes one difference **OR** one similarity **OR** identifies which gases are exchanged. Quality of written communication impedes communication of the science at this level. (1 – 2 marks) **[Level 0]** Insufficient or irrelevant science. Answer not worthy of credit. (0 marks)	6	**This question is targeted at grades up to E** **Indicative scientific points may include:** **differences** • gas exchange in earthworms is through the skin/external part of body, in humans it is through lungs/respiratory system • simple diffusion in earthworms, breathing/ventilation in humans **similarities** • idea that both absorb/take in oxygen • both remove/get rid of carbon dioxide **Use the L1, L2, L3 annotations in Scoris; do not use ticks.**

b	closed (1)	1	
c	cartilage (1)	1	**allow** answer ringed, underlined or ticked more than one answer= 0
	Total	**8**	

Question	Answer	Marks	Guidance
4 a	**any two from** blood is not pumped enough / does not move fast enough (1) oxygen/glucose are not carried quickly enough / AW (1) lack of oxygen/glucose means less respiration/energy / AW (1)	2	**ignore** less blood is pumped **allow** less oxygen/glucose are supplied (1) i**gnore** heart attack / cardiac arrest
b	produces (small) electric current (1) stimulates muscle contraction / causes muscle contraction (1)	2	**allow** shocks the heart / causes electrical impulses or pulses (1) **allow** electronic for electric **allow** stimulates heart beat / maintain regular heart beat (1) **allow** increases or speeds up heart rate or heart beat (1) **allow** any muscular part or chambers of the heart to contract e.g. causes the atrium to contract (1) **ignore** references to relaxing **ignore** valves contracting **ignore** reference to nodes
c	idea that it allows the blood to flow more easily (1) so blood is less likely to form a blood clot (1)	2	**allow** idea that aspirin 'thins' the blood (1) **allow** blood less likely to agglutinate (1) **allow** stops a blood clot/agglutination (1) **ignore** reference to cholesterol / blocked arteries
	Total	**6**	

Question	Answer	Marks	Guidance
5 a	g/dm^3 (1)	1	**allow** correct answer circled underlined or ticked but answer line takes precedence
b i	add water to it (1)	1	**allow** watered down (1)
ii	avoid overdose / easier to measure the correct dosage (1)	1	**allow** so that they are not too strong (for the body) (1)
	Total	**3**	

Question	Answer	Marks	Guidance
6	conclusion for **A** is incorrect but for **B** is correct (1) **A** is an acid since universal indicator goes yellow / can't be an alkali as indicator goes yellow (1) **B** is neutral / pH 7 since universal indicator goes green (1)	3	**both required** **allow A** is an acid **B** is neutral (1) **ignore** comments about other indicators **ignore** comments about other indicators **allow A** is acid as all the indicators give the colours in acid solution and **B** is neutral as all the indicators give the colour in neutral solution (1)
	Total	**3**	

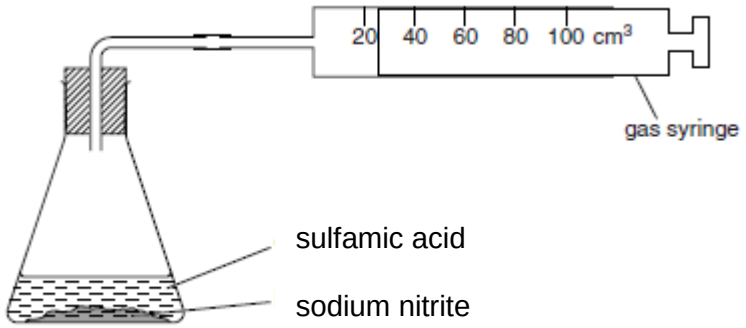
Question	Answer	Marks	Guidance
7 a i	8 (1)	1	
ii	state symbol for sufamic acid is (aq) (1) state symbol for sodium nitrite is (s) (1)	2	**allow** no mention of either chemical but (s) = solid and (aq) = solution (1)
b i	80 (cm^3) (1)	1	
ii	1600 (cm^3)	1	**allow** 1.6 dm^3 if unit given **allow** ecf from (i) i.e. answer to (i) x 20
iii	**Level 3** **Complete description of the method and apparatus used** **AND** **diagram that is gas tight and will not leak** Quality of written communication does not impede communication of the science at this level. (5 – 6 marks) **Level 2** **Complete description of the method and apparatus used** **OR** **diagram that is gas tight and will not leak** Quality of written communication partly impedes communication of the science at this level. (3 – 4 marks) **Level 1** **Incomplete description of experiment** **OR**	6	**This question is targeted at grades up to C.** **Indicative scientific points may include:** • Use of gas syringe / displacement of water using measuring cylinder or inverted burette • Use of stopwatch • Measure volume of gas at regular intervals • Diagram of apparatus 

	diagram that will not work because it is not gas tight Quality of written communication impedes communication of the science at this level. (1 – 2 marks) **Level 0** Insufficient or irrelevant science. Answer not worthy of credit. (0marks)		
	Total	**11**	

Question	Answer	Marks	Guidance
8 a	**A** (1) pH of ethanoic acid must be greater than hydrochloric acid (**and** both less than 7) ora (1)	2	
b	**any two from:** **more** hydrogen ions / ora (1) **more** particles in a smaller or the same volume / ora (1) **more** collisions (per second) / ora (1)	2	**assume answer refers to hydrochloric acid unless otherwise stated** **allow fully** ionised / ora (1) **allow more** crowded particles /ora (1) **allow more** frequent collisions/ more successful collisions/ ora (1) BUT more hydrogen ions in a smaller or same volume (2)
c i	CH_2O (1)	1	**allow** any order of symbols
ii	60 (g/mol)	1	
	Total	**6**	

Question	Answer	Marks	Guidance
9	chloride gives a white ppt / gives a white solid (1) iodide give a yellow ppt / gives a yellow solid (1)	2	**allow** one mark if both colours are correct and solid or ppt not mentioned in both marks **not** reference to colour of a solution
	Total	**2**	

Question	Answer	Marks	Guidance
10 a i	geostationary (orbit) (1)	1	**allow correct answer circled, underlined or ticked but answer line takes precedence**
ii	**any two from:** (idea that) satellite has a wide coverage (1) (idea that) satellite always in same (relative) position (1) satellite receivers (on the house) don't need to be moved to follow satellite / AW (1)	2	
iii	short waves or microwaves penetrate atmosphere / long waves or radio waves don't penetrate atmosphere / AW (1) (therefore) short waves or microwaves reach the receiver / long waves or radio waves don't reach the receiver (1)	2	

b i	orbit shorter / less time / faster (1)	1	**allow** named time that is less than 24 hours e.g. 90 minutes (1)
ii	more frequent updates / covers more areas / AW (1)	1	**allow** quicker information (1)
c	**advantages** **maximum two from:** to see the enemy / find out where the enemy is / may be used for spying (1) quick way to communicate (1) cheaper than others methods of communication over long distances (1) good quality pictures (1) **disadvantages** **maximum two from:** difficult to repair if equipment breaks (1) may be taken over by the enemy (1)	3	 **allow** get information/intel **allow** other countries could destroy them (1)

d	**[Level 3]** **Correct comparison of wavelengths and changes in speed** **AND** **a correct naming of the colours OR a simple reference to refraction.** Quality of written communication does not impede communication of the science at this level. **(5 – 6 marks)** **[Level 2]** **Correct comparison of wavelengths** **AND** **a correct naming of the colours OR a simple reference to refraction.** **OR** **correct colours AND refraction** Quality of written communication partly impedes communication of the science at this level. **(3 – 4 marks)** **[Level 1]** **Correct naming of the colours** **OR** **a simple reference to refraction.** Quality of written communication impedes communication of the science at this level. **(1 – 2 marks)** **Level 0: (0 marks)** Insufficient or irrelevant science. Answer not worthy of credit.	6	**This question is targeted up to grade C** **Indicative scientific points may include:** **Level 3:** • **A** or red light has a longer wavelength **and** changes speed least **AND EITHER** • **A** is red and **B** is violet (**allow** indigo or blue) **OR** • light refracts **Level 2:** • **A** has longer wavelength **AND EITHER** • **A** is red and **B** is violet (**allow** indigo or blue) **OR** • light refracts **OR** **correct colours AND refraction** **Level 1:** **EITHER** • **A** is red and **B** is violet (**allow** indigo or blue or purple) **OR** • light refracts **Use the L1, L2, L3 annotations in Scoris; do not use ticks.**
	Total	**16**	

Question	Answer	Marks	Guidance
11 a	2 speed limits have been broken (1) 18 (m/s) scores (1) **but** 13.4 (m/s) **and** 17.9 (m/s) broken (2)	2	 **allow** 30 (mph) and 40 (mph) broken (2)
b	105 (m) (2) **but if answer is incorrect or incomplete** $\frac{(13+29)}{2}$ x 5 scores (1)	2	 **allow** $\frac{42}{2}$ x 5 (1) **or allow** 21 x 5 (1)
	Total	**4**	

Question	Answer	Marks	Guidance
12 a i	20^0 or 26^0 with valid reason (1) **valid reasons:** wall not flat / smooth / AW ball is weighted / spinning / not round / AW measurements inaccurate / ball does not follow straight line / AW	1	20^0 or 26^0 with invalid reason or no reason scores (0)
ii	repeat readings (if anomalous) (1) take more readings (1)	1	**allow** (calculate) average / mean (1) **ignore** to make it a fair test
b	(football) - angle of hit (broadly) = angle of bounce (1) (light) angle of incidence = angle of reflection (1)	2	**allow** idea of the law of reflection e.g. angle of hit = angle of bounce which is the same as the law of reflection (2)
c	**(reference to) any one from:** idea that only waves can undergo refraction (1) idea that only waves can undergo diffraction (1) idea that only waves can undergo interference (1)	1	
	Total	**5**	

OCR (Oxford Cambridge and RSA Examinations)
1 Hills Road
Cambridge
CB1 2EU

OCR Customer Contact Centre

Education and Learning
Telephone: 01223 553998
Facsimile: 01223 552627
Email: general.qualifications@ocr.org.uk

www.ocr.org.uk

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Facsimile: 01223 552553