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 2014

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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.

These are the annotations, (including abbreviations), including those used in scoris, which are used when marking

Annotation	Meaning of annotation
BP	Blank Page – this annotation **must** be used on all blank pages within an answer booklet (structured or unstructured) and on each page of an additional object where there is no candidate response.

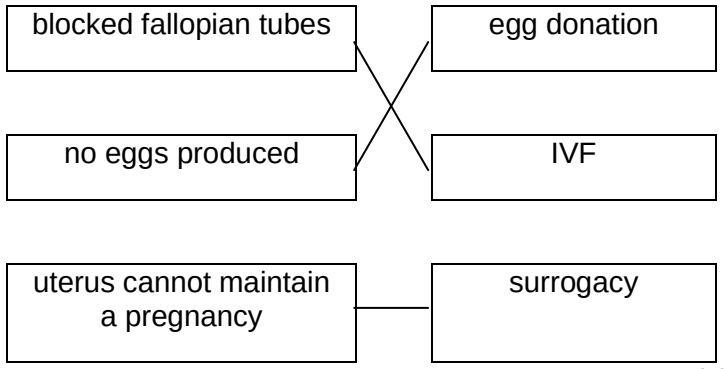
Abbreviations, annotations and conventions used in the detailed Mark Scheme.

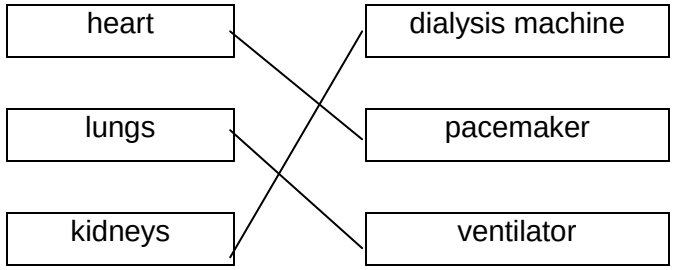
/ = alternative and acceptable answers for the same marking point
(1) = separates marking points
allow = answers that can be accepted
not = answers which are not worthy of credit
reject = answers which are not worthy of credit
ignore = statements which are irrelevant
( ) = words which are not essential 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

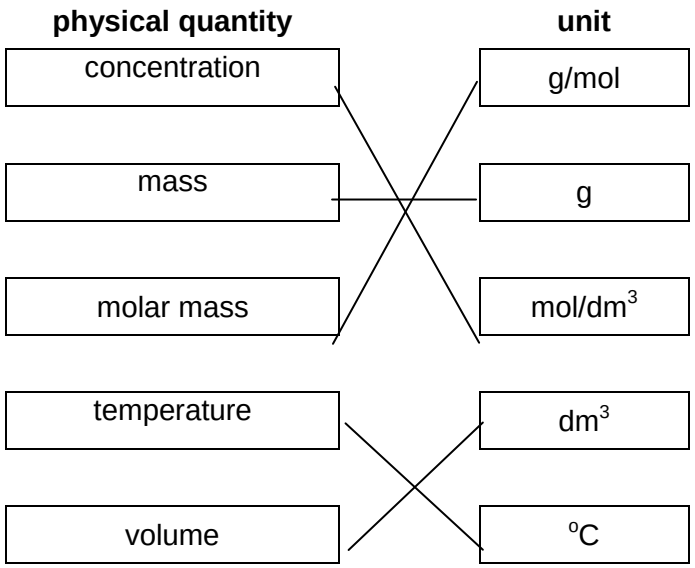
Question	Answer	Marks	Guidance
1 a	small organisms use their whole outer / body surface (1) larger organisms use lungs / special surfaces (1)	2	 **allow** larger organisms use larger surface areas / vastly increased surfaces
b i	**any two from** idea that oxygen through outer surface or skin is nearly constant all year (1) idea that oxygen through outer surface or skin peaks in March (1) idea that oxygen through lungs is lower in the winter / colder months or higher in summer / warmer months (1) idea that peak uptake by lungs is higher than by outer surface or skin / ora (1) idea that uptake by lungs is higher than through outer surface or skin from March to September / ora (1) idea that between October and February rate of uptake is greater through outer surface or skin than through the lungs (1) idea that amount of oxygen taken in is the same at the end of February and/or during October for through outer surface or skin and lungs (1)	2	**need to know whether referring to outer surface or lungs** **If candidate gives a pattern not covered by mark scheme, check graph and if correct award the mark** **allow** uptake through skin is highest in March (1) **allow** peak uptake by lungs is in March / April or spring (1) **allow** December or January is the month with the lowest uptake by both lungs and outer surface or skin (1) **allow** April is the month with the highest **total** uptake (1)

Question	Answer	Marks	Guidance
ii	April (1) **any two from** highest oxygen uptake (1) needs to respire more / more energy (1) oxygen needed for respiration (1)	3	 **allow** more oxygen uptake needed
	Total	**7**	

Question	Answer	Marks	Guidance
2 a	stomach labelled (1) small intestine labelled (1)	2	**allow** label line touching any part of stomach from cardiac sphincter to pyloric sphincter **allow** label line touching any part of small intestine pyloric sphincter to colon
b	**[Level 3]** Answer includes details of how stomach digests protein **and** shows an appreciation of the function of physical digestion in the stomach linked to the solid meal. Quality of written communication does not impede communication of the science at this level. (5 – 6 marks) **[Level 2]** Answer includes details of the digestion of protein in the stomach **or** limited details of digestion **and** some appreciation that physical digestion occurs in the stomach. Quality of written communication partly impedes communication of the science at this level. (3 – 4 marks) **[Level 1]** Answer includes limited details about the digestion of proteins **or** some appreciation that physical digestion occurs in the stomach. 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 C** **Indicative scientific points at Level 2 may include:** chemical digestion- • enzymes are protease • proteins digested to amino acids • stomach acids aid protease function physical digestion- • solid food stays longer because it needs to be broken down (into smaller pieces) / AW so that it increases surface area • Increases surface area for enzymes to work on **Indicative scientific points at Level 1 may include:** chemical digestion- • production of enzymes physical digestion- • stomach squeezes the food / churns • muscle contraction • breaks food into smaller pieces • solid food stays longer because it needs to be broken (into smaller pieces) / AW **Use the L1, L2, L3 annotations in Scoris; do not use ticks.**
	Total	**8**	

Question	Answer	Marks	Guidance
3 a	 (2)	2	all three correct = 2 one or two correct = 1
b i	16% (1)	1	
ii	less sperm (1) some have two tails / two heads (1)	2	**allow** there are **only** 12 sperm **allow** chance of a pregnancy **only** 13% **allow** some sperm are damaged / abnormal / defective / infertile / irregular **ignore** splitting
	Total	**5**	

Question	Answer	Marks	Guidance
4 a	X-ray machine used (1) compound (fracture) (1) ulna and radius damaged (1)	3	 **allow** open / complicated / complex **allow** either way around
b	 (2)	2	all three correct = 2 one or two correct = 1
	Total	**5**	

Question	Answer	Marks	Guidance
5	 **All five** correct **(3)** **Three** or **four** correct **(2)** **Two** correct **(1)**	3	
	Total	**3**	

Question	Answer	Marks	Guidance
6 a	carbon dioxide (1)	1	**allow** CO_2
b i	hydrogen (1)	1	**allow** H_2 **Not** H
ii	**any three from:** ethanoic acid is a weaker acid / hydrochloric acid is a stronger acid (1) some reference to the reacting particle being a hydrogen ion or H^+ (1) ethanoic acid has fewer (reacting) particles / ethanoic acid has less crowded particles /lower concentration of reacting particles / ethanoic acid has reacting particles that are further apart from each other / ora (1) ethanoic acid has fewer collisions (per second) / hydrochloric acid has more collisions(per second) (1)	3	**assume answer refers to ethanoic acid if unclear** **allow** ethanoic acid is a weak acid and hydrochloric acid is a strong acid / ethanoic acid does not completely ionise or dissociate but hydrochloric acid does (1) **ignore** ethanoic acid is less acidic / hydrochloric acid is more acidic **allow** hydrochloric acid has more (reacting) particle / hydrochloric acid has more crowded particles / higher concentration of reacting particles / hydrochloric acid has reacting particles that are closer together (1)
	Total	**5**	

Question	Answer	Marks	Guidance
7 a	water (1) air (1) sulfur (1)	3	 **allow** oxygen **allow** sulfide ores / calcium sulfate
b	stage **2** because it has the reversible symbol (1)	1	must have stage **and** the explanation for a mark
	Total	**4**	

Question	Answer	Marks	Guidance
8 a	**[Level 3]** **Explains that the conclusion is only partly supported by the evidence using both sets of results** **AND** **Describes what is meant by a precipitation reaction** Quality of written communication does not impede communication of the science at this level (5 – 6 marks) **[Level 2]** **Explains that the conclusion is only partly supported by the evidence using both sets of results** **OR** **Describes what is meant by a precipitation reaction AND explains how one result either supports or does not support the conclusion** Quality of written communication partly impedes communication of the science at this level (3 – 4 marks) **[Level 1]** **Describes what is meant by a precipitation reaction** **OR** **Explains how one result either supports or does not support the conclusion** 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 C.** **Relevant points at all levels could include explanations** • Precipitation involves the reaction of solutions to make an insoluble solid • Precipitation involves the collision of ions to make an insoluble solid • Conclusion partly supported because white precipitate with barium chloride indicates sulfate ions are present • Conclusion not supported because iodide ions should give a yellow precipitate with lead nitrate • Conclusion not supported because a cream precipitate with lead nitrate indicates a bromide **allow** solid / ppt instead of precipitate **Use the L1, L2, L3 annotations in scoris. Do not use ticks.**
	Total	**6**	

Question	Answer	Marks	Guidance
b	use of universal indicator (1) match colour against a colour chart / idea that each colour matches to a pH value	2	**not** any other indicator / pH indicator **allow** even if wrong indicator given **allow** if colour matches to a certain level of acidity/alkalinity
	Total	**8**	

Question	Answer	Marks	Guidance
9 a i	500 (g) (1)	1	
a ii	**any two from:** would get more than the GDA for energy (1) would get more than the GDA for carbohydrates (1) possible risk of getting overweight (1) would get more than the GDA for sodium (1) possible increased risk of stroke or heart attack (1)	2	 **allow** will get more than the GDA for calories **allow** it is very fattening / make you obese or fat **allow** increased risk of coronary heart disease / CHD / blocked coronary arteries
c	**any two from:** more research done / more experiments (1) new evidence obtained (1) (more research / new evidence) may lead to different conclusions about GDA (1) GDA figures refer to the standard adult (1) GDA figures do not refer to either male or female (1)	2	 **allow** everyone has their own personal GDA **allow** personal GDA may alter
	Total	**5**	

Question	Answer	Marks	Guidance
10 a	42 (m) (2) **but if answer is incorrect** 12/2 x 7 scores (1)	2	 **allow** 6 x 7 (1) **allow** 12 x 7 (1)
b	17 (m/s) (2) **but if answer is incorrect** 12 + (0.25 x 20) scores (1)	2	 **allow** 12+5 (1)
c	extra force (of wind) / AW (1) opposing Bradley / in opposite direction to Bradley / AW (1) **but** net force reduced / resultant force reduced (2)	2	
	Total	**6**	

Question	Answer	Marks	Guidance
11 a	convex (1)	1	more than one scores 0 marks if answer line blank allow correct answer indicated in list
b	distance or length to focal point / distance or length from (middle of) lens (1) **but** distance or length from (middle of) lens to focal point / ORA (2)	2	
c	real (1)	1	**allow** upside down / inverted / diminished (1) **if more than one answer all must be correct e.g. real and magnified scores (0)**
d	move the lens nearer the insect / move lens away from the insect (1)	1	**allow** moves lens forwards / move lens backwards (1) **allow** lens moves in / lens moves out (1) **allow** idea that lens must be the correct distance from the insect **ignore** turning lens **ignore** lens moves up / down **ignore** zoom the lens **ignore** lens must be close to the insect **ignore** change camera settings
e	2.5 (2) **but if answer is incorrect** 12.5 / 5 scores (1)	2	**ignore** units
f	reflection (1) **but** total internal reflection (2)	2	 **allow** TIR (2) **allow** reflects from all the internal surfaces (2)
	Total	**9**	

Question	Answer	Marks	Guidance
12	**[Level 3]** **Reference to particles moving quicker and producing more force or pressure <u>AND</u> equal and opposite forces propelling rocket.** Quality of written communication does not impede communication of the science at this level. (5 – 6 marks) **[Level 2]** **Reference to particles moving quicker and producing more force or pressure <u>OR</u> equal and opposite forces propelling rocket.** Quality of written communication partly impedes communication of the science at this level. (3 – 4 marks) **[Level 1]** **Simple reference to particles moving and hitting walls / rocket.** 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 up to grade C** **Indicative scientific points may include:** **Level 3:** • higher temperature – faster particles • faster particles more force or pressure **AND** • force pushing particles backwards equals force pushing rocket forwards • greater forward force due to higher backwards force **Level 2:** • high(er) temperature – fast(er) particles • fast(er) particles colliding so more force or more pressure **OR** • equal and opposite forces act inside the rocket • force pushing particles backwards equals force pushing rocket forwards **Level 1:** • particles move • particles hit wall or rocket • gas pushes the rocket forward • gas expands Use the L1, L2, L3 annotations in Scoris; do not use ticks.
	Total	**6**	

Question	Answer	Marks	Guidance
13 a	point towards Galaxy satellite / a fixed point / AW (1)	1	
b i	short orbit time / make many orbits in a day / AW (1)	1	**allow** idea the Earth rotates under the satellite (1) **allow** this satellite moves across the earth (others are fixed) (1)
ii	closer to Earth	1	**allow** 'it' is referring to I.S.S. unless clearly contradictory **allow** ora
c	high altitude / higher above the Earth (1)	1	**allow** (the idea of) a larger viewing angle (1) **allow** both marking points shown in a diagram
	Total	**4**	

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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Head office
Telephone: 01223 552552
Facsimile: 01223 552553