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 2015

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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

Question	Answer	Marks	Guidance
1 a i	pancreas (1)	1	
a ii	idea of enzyme production (1)	1	**allow** secretes **or** releases enzymes allow named enzymes e.g. carbohydrase / protease / lipase / amylase / trypsin **ignore** pepsin **ignore** insulin produced
b	**any two from:** physical involves chewing **or** squeezing the food (1) chemical involves enzymes (1) chemical large (food) molecules are broken down (1)	2	**allow** mastication **allow** for chemical insoluble food is broken down into soluble food **allow** for physical is breaking down large **pieces** (into smaller pieces)
c	egestion (1)	1	more than one answer ringed = 0
	Total	**5**	

Question	Answer	Marks	Guidance
2 a	hinge (1)	1	**ignore** elbow
b	**any two from:** rod is made of carbon fibre (not bone) ora (1) arm would have muscles/ tendons / ligaments attached (1) rod not living tissue (1) no nerves attached to rod to control movement (1) idea that artificial lower arm has several rods but human arm has **two** bones (1)	2	assume talking about artificial arm if not mentioned **allow** would not mend itself if broken (like bone) (1) **allow** bones are different sizes but the rods are the same **allow** no skin covering it / no blood vessels attached to carbon fibre rod (1)
	Total	**3**	

Question	Answer	Marks	Guidance
3	**Level 3** suggests more than **two** reasons for their differences one of which needs to be linked to genetics **and** explains **two** of the reasons. Quality of written communication does not impede communication of the science at this level. (5 – 6 marks) **Level 2** suggests more than **two** reasons for their differences **and** explains **one** of them. Quality of written communication partly impedes communication of the science at this level. (3 – 4 marks) **Level 1** suggest at least **two** reasons for their differences **OR** suggests **one** reason with an explanation. 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)	6	**This question is targeted at grades up to C** **Indicative scientific points- explanations that may include:** • genes for controlling height are different • non identical twins so have different genes / DNA • Patrick is taller he may have started puberty earlier • John may not be releasing enough growth hormone • John may have been ill which caused him to stop growing • Patrick does more exercise so has not put on weight or John might do more exercise as he has more muscle making him heavier • John eats more so has put on extra weight • Patrick has a higher metabolic rate so has not put on weight / ORA **Indicative scientific points- suggestions that may include:** • one may have hormone problems • different stages of puberty / adolescence • different diets • idea that one does more exercise • different genes / DNA • illness **Use the L1, L2, L3 annotations in Scoris; do not use ticks.**
	Total	**6**	

Question	Answer	Marks	Guidance
4 a i	24 (1)	1	
a ii	(no) idea that current size is within allowed limit / most of the results within healthy range / last few results within healthy range(1)	1	 **allow** yes because it dropped below limit for one week
b i	**any two from:** amniocentesis (1) description of amniocentesis (1) chromosomal analysis (1) idea that the chromosome number will be different (1)	2	 **allow** ultrasound to look at the features of the foetus (1) **ignore** just blood tests / just sampling / ultra-scan descriptions include: sample the amniotic fluid / insert needle into amniotic sac or amniotic fluid / take cells from (around) foetus (1) **ignore** insert needle into foetus / insert needle into placenta **allow** counting chromosomes / looking for damaged chromosomes (1) **ignore** looking at cells **ignore** genes will be different if idea of looking for **extra** chromosomes or that there are **47** chromosomes (2) **as an extra marking points** **allow** CVS / chorionic villus sampling (1) **allow** triple test / combined test (1) **allow** description of the combined test (1)

Question	Answer	Marks	Guidance
b ii	**for** identify problems with foetus (1) **but** identify problems with foetus and can decide about abortion (2) idea of putting their mind at rest (1) idea that parents are prepared for a child with (genetic) disorder (1) **but** idea that parents are prepared for a child with (genetic) disorder and can decide about abortion (2) **against** may lead to decision about abortion (1) could be used to identify sex of foetus (1) may harm the foetus / may lead to miscarriage (1) idea that testing is not 100% accurate (1)	3	**allow** parents deserve to know what their child will be like (1) **allow** so they know their child will have Downs syndrome (1) **allow** ethical reasons e.g. 'against God' / 'against human nature' / foetus has the 'right to live' / religious reasons e.g. baby will be how God wants it to be / foetus has no say (1)
	Total	**7**	

Question	Answer	Marks	Guidance
5 a i	450 (litres per minute) (1)	1	
b	(yes) **any two from:** values are increasing (1) less difference between am and pm (1) any two values compared (1)	2	no = zero
b	intercostal(s) (1)	1	**ignore** internal / external
	Total	**4**	

Question	Answer	Marks	Guidance
6 a	**any three from:** nitric acid in burette and/or sodium hydroxide in flask or vice versa (1) use pipette for sodium hydroxide or nitric acid (1) add an indicator or named indicator (to flask) (1) add nitric acid to sodium hydroxide or vice versa (1) until endpoint is reached (1)	3	
b	(nitric) acid or sodium hydroxide is poisonous or harmful or dangerous (1)	1	**allow** so you don't get sodium hydroxide or nitric acid in your mouth. references to safety must be qualified.
	Total	**4**	

Question	Answer	Marks	Guidance
7 a i	air (1)	1	**ignore** oxygen **allow** the atmosphere
ii	sulfur dioxide + oxygen → sulfur trioxide (1)	1	**allow** correct formulae i.e. $SO_2 + O_2 \rightarrow SO_3$ or mix of words and correct formulae If formulae used balancing is not necessary **allow** ⇌ instead of →
b	(percentage yield) decreases / gets smaller / AW (1)	1	
	Total	**3**	

Question	Answer	Marks	Guidance
8 a	17.1 (2) if any other answer then $\frac{12 \times 100}{70}$ (1)	2	**allow** 17.14 (1)
b	sodium (1) idea that sodium content is the highest proportion of GDA / sodium causes heart disease (1)	2	**allow** fat as fat content is high causing heart disease (1)
	Total	**4**	

Question	Answer	Marks	Guidance
9 a	(gas) syringe (1)	1	
b i	calcium carbonate runs out (1) **but** calcium carbonate is the limiting reactant (2)	2	**allow** calcium carbonate runs out first (2) **allow** calcium carbonate is not in excess (2) **ignore** the hydrochloric acid is in excess
ii	0.2 (g) (1)	1	
	Total	**4**	

Question	Answer	Marks	Guidance
10 a	line 3 mass of water is 0.54 (g) (1) line 5 mass of anhydrous copper sulfate is 1.60 (1)	2	**allow** 1.6 (1)
b	yes / no (no mark) evidence from copper sulphate table supporting the prediction e.g. when you go from 1g to 2g the mass goes from 0.36g to 0.72g (which doubles) (1) evidence from sodium carbonate table not supporting the prediction e.g. when you go from 1g to 2g the mass goes from 0.63g to 1.00g (which does not double) (1)	2	**allow** ecf from (a)
	Total	**4**	

Question	Answer	Marks	Guidance
11	**Level 3** **Candidate describes how to prepare and purify a sample of barium sulfate** **AND** **writes a correct word equation.** Quality of written communication does not impede communication of the science at this level. (5 – 6 marks) **Level 2** **Candidate mixes solutions together and attempts either filtration or drying** **OR** **writes a correct word equation.** Quality of written communication partly impedes communication of the science at this level. (3 – 4 marks) **Level 1** **Candidate mixes barium chloride and sodium sulfate solutions** **OR** **attempts a word equation.** 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)	6	**This question is targeted at grades up to grade C.** **Marks can be awarded from a labelled diagram.** **Indicative scientific points at level 3 may include in addition:** • filters off barium sulfate • washes with water • dries in an oven or on window sill **Indicative scientific points at level 2 may include in addition:** • filters off barium sulfate OR • dries in oven or on window sill **Indicative scientific points at level 1 may include:** • idea of mixing barium chloride solution with sodium sulfate solution • **Word equation** barium chloride + sodium sulfate →barium sulfate + sodium chloride **Use the L1, L2, L3 annotations in Scoris; do not use ticks.**
		6	

Question	Answer	Marks	Guidance
12 a	all three points plotted correctly (within +/- ½ a square)	1	correct plots are (5,26) and (7,17) and (8,10)
b	(as the ...focal length) decreases / reduces / AW [1]	1	**allow** lowers / falls [1]
c	6 (mm) [1]	1	**allow** range from 5 (mm) to 7 (mm) scores [1]
d	**any two from** idea of distant object / parallel light [1] object, lens and screen idea [1] distance between (middle) lens and screen [1]	2	**allow** marking points shown on a labelled diagram **allow** use light from a window
	Total	**5**	

Question	Answer	Marks	Guidance
13 a	**any two from** (**Z** is) 9 (m/s) [1] **X** is 2 (m/s) [1] **Y** is 8 (m/s) [1] in **X** and **Y** cars are travelling in same direction / in **Z** cars are travelling in opposite directions [1]	2	**allow** comparisons e.g. 9 (m/s) is greater than 2 (m/s) / 9 (m/s) is greater than 8 (m/s) [2]
b	**any one from:** velocity has (magnitude and) direction (1) speed has magnitude **only** / speed has no direction (1)	1	 **allow** velocity is speed with direction (1) **not** acceleration
c	14 (m/s) (2) **but if incorrect** 6 + (0.5x16) **or** 6 + 8 (1)	2	
	Total	**5**	

Question	Answer	Marks	Guidance
14 a	**advantages** **Meteostat** - (high altitude so) large area covered or see most of the Earth or see most of the weather (1) **Meteostat** – (geostationary so) provides constant monitoring (of one area) (1) **POES** – (low orbit so) better (quality) pictures or see the weather clearly (1) **POES** – (more orbits so) more information (1) **disadvantages** **Meteostat** - (orbits around equator so) can't view the poles (1) **POES** – (many orbits so) idea of intermittent photography (1) **POES** – (low orbit so) limited area of Earth covered (1)	3	to score three marks answer must refer to both orbits **allow** idea of longer term forecast (1) **allow** higher definition (1) **allow** more coverage (1) **allow** more frequent weather updates (1) **allow** idea of lower definition (1) **allow** short time spent studying one area (1)
b	gravity (1)	1	**allow** gravitational force or gravitational pull (1) **ignore** forward force / driving force **not** gravitational potential energy / GPE
c	Moon [1]	1	

Question	Answer	Marks	Guidance
d	**any two from** (the short wavelength radio waves) can get down to the ground [1] (the short wavelength radio waves) penetrate atmosphere [1] long wavelength (radio waves) are reflected by atmosphere [1]	2	 **allow** can get to the satellite [1] **allow** long wavelength (radio waves) cannot penetrate the atmosphere [1]
	Total	**7**	

Question	Answer	Marks	Guidance
15	**any two from** waves overlap [1] some waves add together / constructive interference [1] some waves subtract each other / destructive interference [1] high waves and calm water produced / correct reference to amplitude [1]	2	
	Total	**2**	

Question	Answer	Marks	Guidance
16	**[Level 3]** **Answers must refer clearly to the equivalent quantified average speeds** **AND** **distances travelled.** Quality of written communication does not impede communication of the science at this level. (5–6 marks) **[Level 2]** **Answers must refer clearly to the equivalent quantified average speeds** **OR** **distances travelled.** Quality of written communication partly impedes communication of the science at this level. (3–4 marks) **[Level 1]** **Answers are limited to a simple statement about the average speeds** **OR** **distances being equal.** 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 at level 3:** • **BOTH** the average speed is the same at 9 m/s • **AND** distances are the same at 90 m **Indicative scientific points may include at level 2:** • **EITHER** average speed is the same at 9 m/s • **OR** distances are the same at 90 m **Indicative scientific points may include at level 1:** • **EITHER** the average speeds are the same • **OR** the distances are the same **Use the L1, L2, L3 annotations in Scoris; do not use ticks.**
	Total	**6**	

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