Cambridge National

Science

Unit **R072/01:** How Scientific Ideas Have Developed

Level 1

Mark Scheme for January 2015

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

Available in scoris to annotate scripts

?	indicate uncertainty or ambiguity
BOD	benefit of doubt
CON	contradiction
✗	incorrect response
ECF	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
NBOD	no benefit of doubt

R	reject
✔	correct response
〰	draw attention to particular part of candidate's response
ʌ	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.

Put ticks (✓) in the two correct boxes.

Put ticks (✓) in the two correct boxes.

This would be worth 1 mark.

This would be worth 0 marks.

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	✔	✘	✔	✔	✔				✔	
Paris				✔	✔		✔	✔	✔	
Southampton	✔	✘		✔		✔	✔		✔	
Score:	2	2	1	1	1	1	0	0	0	NR

Question			Answer			Mark	Guidance
1	a		Africa & India	✓		2	
			South America and Africa	✓			
	b		Earth shrinks / wrinkles			1	
	c		They check each other's data	✓		2	
			The team shares ideas	✓			
	d		**Any two from:** jigsaw fit; idea of linked /similar /continuous….. coal deposits; rock strata; mountain ranges;			2	Ignore: Fossils
	e		300 - 200; 100 (million years)			2	Correct answer with no working scores (2)
	f	i	he was not a geologist / was a meteorologist / studied astronomy			1	
		ii	C; E;			2	
	g					2	
			Earthquakes	✓			
			Formation of mountains	✓			
	h				$\frac{1000}{0.05}$	1	
					Total	**[15]**	

Question			Answer	Mark	Guidance
2	a		To ensure comparability / control variable(s)	1	Accept; "fair test"
	b	i	(9.1-4.5) = 4.6;. mmol/L	2	allow (9.1 - 4.5) for one mark
		ii	(4.6/4.5) x 100 / 4.5x2=9.0 102%;	2	Allow: ECF from part (i) Allow: 102% without working for both marks
	c	i	Values are higher for high carbohydrate breakfast (ORA); carbohydrates break down to form glucose (ORA)	2	Ignore reference to energy
		ii	**Similarity**: Increases overall Rises after breakfast / dropped back to near normal later; **Difference**: large variation for high carbohydrate / small change for high protein;	2	
		iii	**any two from:** repeat same tests; use different (breakfast)foods; Measure his blood glucose levels for longer after breakfast;	2	
		iv	friend is not a scientist/expert; cannot evaluate Kevin's work	2	Accept: peer review is anonymous

Question			Answer	Marks	Guidance
	d		**[Level 3]** Gives a detailed and accurate account of the use and control of glucose. Quality of written communication does not impede communication of the science at this level. (5 – 6 marks) **[Level 2]** Makes a correct statement about glucose and Insulin or gives a detailed account of either. Quality of written communication partly impedes communication of the science at this level. (3 – 4 marks) **[Level 1]** Makes a correct statement about glucose or insulin 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 Level one Distinction.** **Indicative scientific points may include:** Use of glucose : • From food / stored glycogen • Delivered to cells • Provides energy • For respiration • For movement / exercise • For other named processes (eg growth) How insulin controls blood glucose level: • Insulin released into bloodstream • From the pancreas • When glucose level is high • Maintains constant glucose level in the blood • Causes liver (and muscle) cells • To convert glucose to glycogen **Use the L1, L2, L3 annotations in Scoris; do not use ticks.**
			Total	**[19]**	

Question			Answer	Mark	Guidance
3	a		300,000 ——— km/s	2	
	b		microwaves	1	
	c		hypothesis ✓	1	
	d		(table)	1	
	e		**Any two from:** Ensure water is at room temperature; Repeat experiments; Look for similar results; Look at other peoples data/ experiments; Literature/internet search;	2	
			Total	**[7]**	

Question 3d table:

	Warmer	Colder	Same
1	✓		
2			✓

Question			Answer	Marks	Guidance
4	a		**[Level 3]** Detailed description of both Copernicus' and Ancient model Quality of written communication does not impede communication of the science at this level. (5 – 6 marks) **[Level 2]** Makes a correct statement about Copernicus' and the Ancient model or gives a detailed description of the modern model. Quality of written communication partly impedes communication of the science at this level. (3 – 4 marks) **[Level 1]** Makes a correct statement about Copernicus' or the Ancient model. 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 Level one Distinction** **Indicative scientific points may include:** Ancient/Geocentric model: • Earth at the centre OWTTE • Sun, moon, planets etc rotate around Earth • Other planets called "wanderers" Copernicus' Heliocentric model: • Sun at centre • Earth rotates around sun • Planets also orbit sun • Planets travel at different speeds • Moon orbits earth • Stars are outside the solar system • Galaxies exist outside the Milky Way **Ignore** Earth is not at the centre **Use the L1, L2, L3 annotations in Scoris; do not use ticks.**
	b	i	Ancient Greeks could not see moons/details; Invention of the telescope;	2	
	b	ii	<table><tr><td>gravity</td><td>✓</td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td>laws of motion</td><td>✓</td></tr></table>	2	
			Total	**[10]**	

Question			Answer	Mark	Guidance
5	a		(All) grew long hair (during their lifetime); acquired characteristics/long hair are passed on	2	Ignore; references to genes
	b		**variation**: some individuals have longer hair; **competition**: some have an advantage in survival; **selection**: those with advantage breed / pass on characteristics (/genes); **QWC** Answer is clear and addresses the question	4	Allow: Mutation (producing variation) Allow :"fittest survive" OWTTE (1) Allow: short haired mammoths do not survive/ breed
	c		**Any two from:** change in environment over time; elephants suited / well adapted (to warmer conditions); mammoths not well adapted / did not survive to breed/ evolved into elephants	2	Allow idea of competition for resources
	d		There is no proof /can't test/collect data/results; No witnesses to what happened	1	
			Total	**[9]**	
			Overall total	**[60]**	

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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