OCR
Oxford Cambridge and RSA

GCSE

Biology A

Unit **A163/02**: Ideas in Context plus B7 (Higher 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.

Available in scoris to annotate scripts

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.
?	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
^	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 <u>should be blank</u> (or have indication of choice crossed out).

Edinburgh			✓			✓	✓	✓	✓	
Manchester	✓	×	✓	✓	✓				✓	
Paris				✓	✓		✓	✓	✓	
Southampton	✓	×		✓		✓	✓		✓	
Score:	**2**	**2**	**1**	**1**	**1**	**1**	**0**	**0**	**0**	**NR**

MARK SCHEME:

Question			CBT Question Numbers	Answer	Mark	Guidance
1	a	i	1ai	155 95;	1	Both required for the mark Units not required
		ii	1aii	<table><tr><th>low</th><th>ideal</th><th>pre-high</th><th>high</th></tr><tr><td></td><td></td><td></td><td>✓</td></tr></table>	1	
	b		1b	27 to 35;	1	
	c		1c	Idea of doing different activities/ exercise / stress / salt / alcohol / smoking;	1	OWTTE **Ignore** medicine / diet / sugar
	d	i	1di	120 (2); 840 / 7;	2	120 = 2 marks
		ii	1dii	Idea of best estimate of true/actual value; OR compare with other data / results /means;	1	**Allow** accurate **value** **Ignore** actual results **Ignore** reference to outliers **Ignore** true **results / accurate results**
		iii	1diii	115; 125;	1	Accept either way round Units not required
		iv	1div	*Idea that blood pressure (systolic) is lower* after answer to part b / between day 1/155 to day 60 / 115 / between start and end / between first 7 days / 142.7 and last 7 days / 120; Ref to diastolic pressure also dropped at same time;	2	ecf for day medicine taken
				Total	**10**	

Question			CBT Question Numbers	Answer	Mark	Guidance
2	a			**[Level 3]** Good explanation of 3 areas OR Good explanation of 2 areas AND partially explains 3rd area. No scientific errors for 6 marks. Quality of written communication does not impede communication of the science at this level. (5 – 6 marks) **[Level 2]** Good explanation of 2 areas OR Good explanation and 1 or 2 partial explanations OR 3 areas partially explained. Quality of written communication partly impedes communication of the science at this level. (3 – 4 marks) **[Level 1]** Good explanation of 1 area OR Partial explanation of 2 areas. OR Partial of 1 area 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 A/A*** **1. When too hot, may include:** • Sweat (loses heat) • (Cools as it) evaporates • Correct ref to vasodilation • Hairs lie flat **2. When too cold, may include:** • Increased respiration • Shivering (to generate heat) • Correct ref to vasoconstriction • Hairs stand up • Reduction of heat loss from skin **3. Monitoring may include:** • (temperature) receptors • sensory neurones • hypothalamus detects blood temperature • idea heat gained must equal heat lost • negative feedback **Use the L1, L2, L3 annotations in Scoris; do not use ticks.** **Any major error e.g. blood vessels moving, limits area to partial response BUT do not penalise twice.**
	b			Ref to negative feedback / antagonistic; Idea that it stops it getting too hot / temperature lowered /cools it down;	2	**Ignore** any reference to heat.
				Total	**8**	

Question			CBT Question Numbers	Answer	Mark	Guidance
3	a			**Any two from** Pressure (in blood); Idea of formed from plasma; (Forces plasma out) **through** capillaries (wall);	2	Ignore capillary bed
	b			Transport oxygen / glucose (from blood to cells); Transports waste / carbon dioxide / urea (from cells to blood); diffusion;	3	Ignore nutrients
				Total	**5**	

Question			CBT Question Numbers	Answer	Mark	Guidance
4				**[Level 3]** Explanation of how build-up of insecticide occurs. Quality of written communication does not impede communication of the science at this level. (5 – 6 marks) **[Level 2]** Idea that the higher up the food chain insecticides build-up in individuals. Quality of written communication partly impedes communication of the science at this level. (3 – 4 marks) **[Level 1]** Vague account that insecticides kill organisms other than insect pests. The effect of insecticides on the food web. 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 A** **Indicative scientific points at Level 3 may include:** • explanation of how concentration increase happens i.e. each step of food chain **eats more** of the individuals below them. • numbers at top of pyramid **fewer** so insecticides more concentrated • insecticides concentration reaches **lethal levels** **Indicative scientific points at Level 2 may include:** • idea of bioaccumulation • insecticides gets more concentrated higher up the food chain • may build up • low dose does not kill insects • organisms may eat these (contaminated) pests **Indicative scientific points at Level 1 may include:** • insecticides kill organisms other than pests • may kill pollinators / useful insects • idea of disruption to food chain / web **Ignore reference to eutrophication** **Use the L1, L2, L3 annotations in Scoris; do not use ticks.**
				Total	**6**	

Question			CBT Question Numbers	Answer	Mark	Guidance
5	a			Person A 84 - 90 mins; Person B 60 mins;	1	Both answers for 1 mark
	b			**Any three from:** A is high**er** than B; B starts to drop before A ; B glucose dropped / removed **more** quickly; B returns to start / normal level;	3	ORA **Ignore** reference to numbers - refers to rate of drop **Ignore** constant / steady **Ignore** idea that A does not return to start
	c			B is healthy / A is unhealthy; A is diabetic / B is not diabetic; (Correct reference to) insulin;	3	
	d			The observation **increases the likelihood / confidence** in the prediction; But does not necessarily prove it is correct;	2	**Ignore** prediction is correct I**gnore** reinforces / supports / strengthens
				Total	**9**	

Question			CBT Question Numbers	Answer	Mark	Guidance
6				**[Level 3]** Answer includes point or points from 3 areas. Quality of written communication does not impede communication of the science at this level. (5 – 6 marks) **[Level 2]** Answer includes point or points from 2 areas. Quality of written communication partly impedes communication of the science at this level. (3 – 4 marks) **[Level 1]** Answer includes point or points from 1 area. 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** **Predictions may include:** • air bubbles form (in blood) **when surfacing** **Problems may include:** • pain • bends • damage to organs • could prevent blood flow / death **Prevention points may include:** • need to come up slowly • dive for less time • not go as deep **Use the L1, L2, L3 annotations in Scoris; do not use ticks.**
				Total	6	

Question			CBT Question Numbers	Answer	Mark	Guidance
7	a			Ann **right** AND Alistair **wrong** AND Wendy **wrong**; (Ann is correct) because mean is more reliable / accurate / better / reduce the effect of outliers; (Alistair is wrong) (because cannot base conclusions on) one plant / result / outlier; (Wendy is wrong) because the means provide better data	4	1 mark for identifying correct or wrong. 1 mark for each explanation Do not award explanation mark if person has wrong conclusion.
	b			**Closed…….** Idea that nothing was added / taken away; Idea of recycling; OR **Open…….** Idea that something is added e.g. inputs / water / fertiliser / seeds were added; Idea that something is taken away e.g. crop / seeds were removed;	2	**Accept** examples e.g. seeds / fertiliser / water **Accept** idea that O_2 / CO_2 recycled during photosynthesis / respiration. Ignore reference to heat / light / sunlight / energy
				Total	**6**	

Question			CBT Question Numbers	Answer	Mark	Guidance
8	a			E before C; C before D; D before B; B before A;	4	**If the same letter appears twice, ignore that letter eg ECDEA scores 1 mark (i.e. C before D)**
	b			Yes because black / UV fluorescent band present;	1	
				Total	**5**	

Question			CBT Question Numbers	Answer	Mark	Guidance
9	a			They need carefully controlled conditions for growth. They have a rapid rate of reproduction. ✓ They can make complex molecules. ✓ There are no ethical concerns over their culture. ✓ They cannot be seen with the naked eye. Some of them can cause disease in other living things. They can cross-contaminate other industrial …	3	Accept any indication of correct response. Minus 1 mark for each additional incorrect response.
	b			red blood cells single cell protein ✓ a replacement heart antibiotics ✓ a genetically modified wheat plant enzymes ✓ nerve cells	2	3 correct = 2 marks 2 correct = 1 mark Accept any indication of correct response. Minus 1 mark for each additional incorrect response.
				Total	**5**	
				Paper Total	**60**	

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