OCR
RECOGNISING ACHIEVEMENT

GCSE

Biology A

General Certificate of Secondary Education

Unit **A222/02:** Modules B4, B5, B6 (Higher Tier)

Mark Scheme for June 2012

Oxford Cambridge and RSA Examinations

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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.

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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
<u>words</u>	underlined words must be present in answer to score a mark
ecf	error carried forward
AW/owtte	credit alternative wording/or words to that effect
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
∧	information omitted

Subject-specific Marking Instructions

a.   Accept any clear, unambiguous response (including mis-spellings of scientific terms if they are *phonetically* correct, but always check the guidance column for exclusions).

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 the third and fourth boxes are required for the mark:

☐	☐	⃥
☐	☐	⃥
⃥	✓	✓
⃥	⃥	✓
☐	☐	☐

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-box questions:

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 and other markings. If there are no ticks, accept clear, unambiguous indications, e.g. shading or crosses. Credit should be given according to the instructions given in the guidance column for the question. 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 cities in England:

Edinburgh ☐

Manchester ☐

Paris ☐

Southampton ☐

the second and fourth boxes should have ticks (or other clear indication of choice) and the first and third underline 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**

e.   For answers marked by levels of response:
   i.   **Read through the whole answer from start to finish**
   ii. **Decide the level** that **best fits** the answer – match the quality of the answer to the closest level descriptor
   iii. **To determine the mark within the level**, consider the following:

Descriptor	Award mark
A good match to the level descriptor	The higher mark in the level
Just matches the level descriptor	The lower mark in the level

   iv. Use the **L1**, **L2**, **L3** annotations in Scoris to show your decision; do not use ticks.

   Quality of Written Communication skills assessed in 6-mark extended writing questions include:
   • appropriate use of correct scientific terms
   • spelling, punctuation and grammar
   • developing a structured, persuasive argument
   • selecting and using evidence to support an argument
   • considering different sides of a debate in a balanced way
   • logical sequencing.

Question			Answer	Marks	Guidance
1	(a)	(i)	homeostasis / thermoregulation / temperature regulation / temperature control;	1	**accept** phonetic spellings
		(ii)	(energy) loss is the same as / equals (energy) gain;	1	**accept** visa versa **accept** "they are balanced" / happen at the same rate / they even out OWTTE
	(b)		use of receptors; in skin for external temperature; in brain/hypothalamus for blood temperature;	3	need to make correct link between the site and the temperature detected **accept** "heat" for "temperature"
			Total	**5**	

Question			Answer	Marks	Guidance
2	(a)		(in) food **and** respiration	1	**accept** "eat" for food **accept** "metabolic water" or metabolism for respiration **reject** excretion
	(b)		(see table below)	2	3 correct rows = 2 marks 2 correct rows = 1 mark 0 or 1 correct rows = 0 marks more than one tick in a row is incorrect
	(c)		pituitary gland;	1	
			Total	**4**	

process	decreases	increases	stays the same
...sugar			✓
...water	✓		
...urea			✓

Question			Answer	Marks	Guidance
3	(a)		detects any change in oxygen levels — receptors processes information about oxygen levels — the brain adds more or less oxygen — effectors	1	all lines correct = 1 mark
	(b)		*any three from:* idea that a change (is detected); (1) change reversed; (1) to the norm/ set point; (1) named example eg. temperature control; (1)	3	OWTTE
			Total	**4**	

Question			Answer			Marks	Guidance
4	(a)		nucleus / chromosomes; cytoplasm / ribosomes / rough ER;			1	**ignore** "gene / genes" **two correct responses = 1 mark** **accept** phonetic spellings, correct abbreviations e.g. RER
	(b)		**The DNA molecule…**	**true**	**false**	2	5 correct = 2 marks 4 correct = 1 mark 3 or less correct = 0 marks
			… has a double helix shape.	✓			
			… is found in chromosomes.	✓			more than one tick in a row is incorrect
			…. is made from four strands.		✓		
			… contains five different types of bases.		✓		
			… has bases which always pair up in the same way.	✓			
					Total	3	

Question			Answer	Marks	Guidance
5	(a)		*any three from;* auxin in the <u>tip</u> of plant; (1) auxin diffuses away from the tip; (1) auxin moves away from bright light/collects on dark side of plant shoot; (1) auxin promotes increased growth on dark side; (1)	3	OWTTE **accept** elongation on the dark side
	(b)		meristem / cambium;	1	**accept** phonetic spellings
			Total	4	

A222/02 **Mark Scheme** June 2012

Question			Answer	Marks	Guidance
6	(a)	(i)	**A** increases / doubles / multiplies; **B** separate / move apart / unwind / unzip / split / replicate / copies /doubles; **D** separate / move apart / split / dividing;	3	**reject** "halving" for D
		(ii)	D **and** E;	1	**allow** D only **reject** E only
	(b)		<table><tr><td>**true**</td><td>**false**</td></tr><tr><td>✓</td><td></td></tr><tr><td></td><td>✓</td></tr><tr><td>✓</td><td></td></tr></table>	1	3 correct responses = 1 mark more than one tick in a row is incorrect
			Total	**5**	

Question			Answer	Marks	Guidance
7	(a)		<table><tr><td>axon</td><td>**B**</td></tr><tr><td>fatty sheath</td><td>**C**</td></tr></table>	1	**two correct responses = 1 mark**
	(b)		80;	1	1 mark for (90 + 80 + 85 + 75 + 70) ÷ 5 = 80 (m/s)
	(c)		idea of less insulation (from nearby neurons); idea of decrease in speed of (nerve) impulse / transmission;	2	**accept** "impulses leak out" **ignore** idea of protection of the neuron **ignore** idea of leak of information **accept** signal / message / information
	(d)		effector;	1	
			Total	**5**	

Question			Answer	Marks	Guidance
8	(a)		(B) A D C E	2	all four letters correct = 1 mark sequence correct = 1 mark
	(b)		only the first neuron can release the synapse chemical; only the second neuron contains receptor molecules (to accept the synapse chemical);	2	OWTTE
	(c)		removed **and** increases	1	2 correct responses = 1 mark
			Total	5	

Mark Scheme

Question			Answer	Marks	Guidance
9	(a)	(i)	storage **AND** retrieval of information;	1	OWTTE
		(ii)	cerebral cortex / cerebrum / cerebral hemispheres;	1	**ignore** frontal / prefrontal lobe **reject** cerebellum
	(b)		 I look for patterns in what I am learning … ✔ I go over my school work time and time again. ✔ I colour-code my notes. ✔	2	3 correct = 2 marks 2 correct = 1 mark see note 12 if more than 3 ticks
	(c)		Daniel **and** Emma;	1	both correct responses (either order) = 1 mark
	(d)		D (1); G (1);	2	**accept** in either order
			Total	**7**	
			Overall total	**42**	

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