

OXFORD

INTERNATIONAL
AQA EXAMINATIONS

INTERNATIONAL GCSE

COMBINED SCIENCE DOUBLE AWARD BIOLOGY

9204/BC

PAPER 1 – CORE TIER

Mark scheme

Specimen material

Mark schemes are prepared by the Lead Assessment Writer and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation events which all associates participate in and is the scheme which was used by them in this examination. The standardisation process ensures that the mark scheme covers the students' responses to questions and that every associate understands and applies it in the same correct way. As preparation for standardisation each associate analyses a number of students' scripts. Alternative answers not already covered by the mark scheme are discussed and legislated for. If, after the standardisation process, associates encounter unusual answers which have not been raised they are required to refer these to the Lead Assessment Writer.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of students' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

Level of response marking instructions

Level of response mark schemes are broken down into levels, each of which has a descriptor. The descriptor for the level shows the average performance for the level. There are marks in each level.

Before you apply the mark scheme to a student's answer read through the answer and annotate it (as instructed) to show the qualities that are being looked for. You can then apply the mark scheme.

Step 1 Determine a level

Start at the lowest level of the mark scheme and use it as a ladder to see whether the answer meets the descriptor for that level. The descriptor for the level indicates the different qualities that might be seen in the student's answer for that level. If it meets the lowest level then go to the next one and decide if it meets this level, and so on, until you have a match between the level descriptor and the answer. With practice and familiarity you will find that for better answers you will be able to quickly skip through the lower levels of the mark scheme.

When assigning a level you should look at the overall quality of the answer and not look to pick holes in small and specific parts of the answer where the student has not performed quite as well as the rest. If the answer covers different aspects of different levels of the mark scheme you should use a best fit approach for defining the level and then use the variability of the response to help decide the mark within the level, ie if the response is predominantly level 3 with a small amount of level 4 material it would be placed in level 3 but be awarded a mark near the top of the level because of the level 4 content.

Step 2 Determine a mark

Once you have assigned a level you need to decide on the mark. The descriptors on how to allocate marks can help with this. The exemplar materials used during standardisation will help. There will be an answer in the standardising materials which will correspond with each level of the mark scheme. This answer will have been awarded a mark by the Lead Examiner. You can compare the student's answer with the example to determine if it is the same standard, better or worse than the example. You can then use this to allocate a mark for the answer based on the Lead Examiner's mark on the example.

You may well need to read back through the answer as you apply the mark scheme to clarify points and assure yourself that the level and the mark are appropriate.

Indicative content in the mark scheme is provided as a guide for examiners. It is not intended to be exhaustive and you must credit other valid points. Students do not have to cover all of the points mentioned in the Indicative content to reach the highest level of the mark scheme.

An answer which contains nothing of relevance to the question must be awarded no marks.

Question 1

Question	Answers	Extra information	Mark
01.1	cytoplasm		1
01.2	cell membrane		1
01.3		one mark for each line extra lines cancel	1 1 1
01.4	nucleus	allow phonetic spellings allow chromosome/DNA/ genes/mitochondria	1
01.5	(aerobic) respiration		1
01.6	diffusion		1
01.7	higher concentration of oxygen molecules outside the cell (and) movement is from a higher to a lower concentration		1 1
Total			10

Question 2

Question	Answers	Extra information	Mark
02.1	large area	allow thin/large/big/flat/light allow adaptations that cannot be seen eg internal air spaces	1
02.2	protect it or stop it being eaten		1
02.3	stores water	ignore absorbs water from soil/ air ignore nutrients	1
02.4	any one from <ul style="list-style-type: none"> • light • (named) nutrient • minerals • space • water. 	ignore reference to carbohydrates/proteins/fats/ carbon dioxide	1
02.5		one mark for each line extra lines cancel	1 1 1
02.6	food		1
02.7	18 to 30	allow 30 to 18 allow 12 ignore units	1
02.8	small sample size or only one age/gender	allow only 49 lizards/not representative/not enough evidence	1
Total			10

MARK SCHEME – INTERNATIONAL GCSE COMBINED SCIENCE DOUBLE AWARD
BIOLOGY – CORE TIER – SPECIMEN MATERIAL

Question	Answers	Extra information	Mark
03.1	J		1
03.2	D F G	in any order	1 1 1
03.3	so both solutions at correct temperature		1
03.4	temperature in °C time taken in minutes 3, 2, 9	allow 1 mark for temperature and time without units allow 1 mark for units without labels allow 1 mark for 2 correct observations	1 1 2
03.5	40 °C	allow ecf from 04.4	1
03.6	enzyme changes shape/ denatured (so) enzyme doesn't catalyse the reaction/does not work	allow enzyme no longer fits the substrate	1 1
03.7	any two from: <ul style="list-style-type: none"> • absorbed • (into the) bloodstream • used in respiration. 		2
Total			14

Question 4

Question	Answers	Extra information	Mark
04.1	any one from: <ul style="list-style-type: none"> • defend against pathogens • phagocytosis • produce antibodies/ antitoxins. 		1
04.2	transport oxygen		1
04.3	they are small fragments of cells		1
04.4	liver kidney	must be in correct order	1 1
04.5	any two from: <ul style="list-style-type: none"> • arteries have thicker walls • only veins have valves • arteries carry blood away from heart or veins carry blood towards heart. 		2
04.6	ventricles push the blood further/round the body or atrium/atria only push blood short distance/to ventricles		1
04.7	any two from: <ul style="list-style-type: none"> • that it doesn't cause an immune response or isn't rejected/damaged by white blood cells • whether it is a long lasting material/doesn't decompose/corrode/inert • if it is strong (to withstand pressure) • it will open at the right pressure • that it doesn't cause clotting • that it doesn't leak or it prevents backflow • non toxic. 		2
Total			10

Question 5

Question	Answers	Extra information	Mark			
05.1	any three from: <ul style="list-style-type: none"> • faster/shorter lifecycle • cheaper • less ethical concerns • more offspring • less space needed/they are smaller. 		3			
05.2	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; height: 20px;"></td> <td style="width: 40px; text-align: center;">Nn</td> <td style="width: 40px; text-align: center;">nn</td> </tr> </table>		Nn	nn		2
	Nn	nn				
05.3	nn circled	allow ecf	1			
05.4	25%	allow ecf	1			
05.5	any one from: <ul style="list-style-type: none"> • more confident in results • to spot anomalies • to calculate a mean. 		1			
05.6	(pair) 3	allow ecf	1			
05.7	any one from: <ul style="list-style-type: none"> • contamination • infection • temperature change • lack of food • flies died • escaped • did not mate • both same sex. 		1			
05.8	23 (%)		1			
05.9	alleles are inherited randomly		1			
Total			12			

Question 6

Question	Answers	Extra information	Mark
06.1	(sun)light		1
06.2	chlorophyll		1
06.3	any two from: <ul style="list-style-type: none"> • to check that the temperature isn't changing • rate of reaction changes with temperature • temperature is a variable that needs to be controlled. 	ignore reference to fair test allow lamp gives out heat	2
06.4	$\frac{(10+9+11)}{3}$ 10	allow 10 with no working shown for 2 marks allow 15 (correct calculation without removing anomaly) for 1 mark	1 1
06.5	label on y-axis as 'number of bubbles per minute' point correctly plotted line of best fit drawn	allow joined points	1 1 1
06.6	as the distance increases, the number of bubbles released decreases		1
Total			10

Question 7

Question	Answers	Extra information	Mark
07.1	A		1
07.2	not connected to brain or coordinated only by spinal cord		1
07.3	1.2 / 60 0.02	allow 0.02 with no working shown for 2 marks	1 1
07.4	don't involve the brain involve less neurones	allow no thinking allow only 3 neurones	1 1
07.5	distance decreases (but) the two sets of results overlap	allow use of appropriate numbers allow use of appropriate numbers – eg 5 of the 'after' results overlap with the 'before' results allow 'wide spread of results' accept use of one pair of results only – if meaning is clear accept use of one pair of overlapping results	1 1
07.6	any two sensible suggestions: <ul style="list-style-type: none"> • more repetitions • perform investigation on several other people • use other (measured) mass/volume of coffee • use different/more time intervals • other suggested measure of reaction time – eg computer-generated light flash + time measurement • use pure caffeine or caffeine tablets. 		2
Total			10

Question 8

Question	Answers	Extra information	Mark
08.1	moist/damp		1
	warm		1
08.2	aerobic respiration is more efficient		1

MARK SCHEME – INTERNATIONAL GCSE COMBINED SCIENCE DOUBLE AWARD
BIOLOGY – CORE TIER – SPECIMEN MATERIAL

Question	Answers	Extra information		Mark
08.3	Examiners should also refer to the information on page 3.			6
0 marks	Level 1 (1-2 marks)	Level 2 (3-4 marks)	Level 3 (5-6 marks)	
No relevant content.	For at least one process either the organism that carries it out or the carbon compound used or the carbon compound produced is described or for at least one organism either the carbon compound it uses or the carbon compound it produces is described or at least one process is named.	For some processes (at least one of which is named) either the organisms involved or the carbon compounds used or the carbon compounds produced are described.	For at least one named process an organism and either the carbon compound used for the process or the carbon compound produced by the process are described and for other processes (at least one of which is named) either the organism or the carbon compounds used or the carbon compounds produced are described (as in Level 2).	
Indicative content:				
<ul style="list-style-type: none"> • (green) plants photosynthesise • photosynthesis takes in carbon dioxide • (green) plants use carbon to make carbohydrate/protein/fat/organic compounds/named (eg enzymes / cellulose) • animals eat (green) plants (and other animals) • (green) plants respire • animals respire • respiration releases carbon dioxide • (green) plants and animals die • microorganisms decay/decompose/rot/break down/feed on dead organisms • microorganisms respire. 				
Total				9

Question 9

Question	Answers	Extra information	Mark
09.1	population became (geographically) isolated/separated from other species	allow references to adaptations to unique environmental conditions on the island	1
09.2	black rats introduced a new disease (which killed native rats) black rats out-competed the native rats		1 1
09.3	some rats become resistant due to (random) mutation and resistant rats survive/non-resistant rats die then resistant rats pass allele for resistance to offspring so frequency of resistant allele increases in population		1 1 1 1
Total			7

Question 10

Question	Answers	Extra information	Mark
10.1	(water through a) partially permeable membrane	allow semi/selectively permeable	1
	from dilute to (more) concentrated solution	allow from a high concentration of water to a low concentration (of water)	1
		allow from high water potential to low water potential	
	passive process	allow down a concentration gradient of water do not accept along a concentration gradient of water allow requires no energy	1
10.2	a group of cells with similar structure/function		1
10.3	(more) CO ₂ can enter the leaf (for photosynthesis)		1
10.4	0.1 × 0.1 = 0.01 (mm ²)		1
	200	allow 200 with no working shown for 2 marks	1
Total			8

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