OXFORD

INTERNATIONAL
AQA EXAMINATIONS

INTERNATIONAL GCSE BIOLOGY 9201/2

Paper 2

Mark Scheme
November 2021

Version: 1.0 Final Mark Scheme

BY92012/MS

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.

Further copies of this mark scheme are available from aqa.org.uk

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	Answers	Extra information	Mark	AO / Spec. Ref.
01.1	cytoplasm		1	AO1 3.1.1a

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.2	C		1	AO2 3.1.1a

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.3	D		1	AO2 3.1.1a

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.4	tissue(s)		1	AO1 3.1.2b

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.5	allow **1** mark for 1 or 2 correct do **not** accept more than one line from a box on the left **Organ** / **Organ system** Brain → Nervous system Heart → Circulatory system Stomach → Digestive system		2	AO1 3.2.3a 3.1.3c 3.4.1.a 3.4.1b

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.6	breathe in / inhale as much as you can blow / exhale through the tube (until you cannot breathe out any more air) record volume of water displaced **or** record volume of water that left the bottle **or** subtract the first reading from the second reading		1 1 1	AO4 3.2.5 6.1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.7	height of the students		1	AO4 3.2.5 6.4

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.8	(group 1) taller (so) larger lungs **or** (so) more space in thorax		1 1	AO3 AO2 3.2.5a

Total			**12**

Question	Answers	Extra information	Mark	AO / Spec. Ref.
02.1	sheep A and sheep C		1	AO3 3.5.1a

Question	Answers	Extra information	Mark	AO / Spec. Ref.
02.2	sheep are selected artificially **or** sheep are selected by human / farmer (for desirable characteristic)	ignore not natural allow because it is selective breeding	1	AO2 3.6.2b

Question	Answers	Extra information	Mark	AO / Spec. Ref.
02.3	any **one** from: • (farmer) had to wait for offspring to be old enough to reproduce • needed repeating many times	allow had to wait for gestation	1	AO3 3.5.1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
02.4	milk production		1	AO3 3.5 3.5.3a 6.3(5)

Question	Answers	Extra information	Mark	AO / Spec. Ref.
02.5	body mass of adult		1	AO3 3.5 3.5.3a 6.3 (5)

Question	Answers	Extra information	Mark	AO / Spec. Ref.
02.6	(A =) egg (B =) embryo		1 1	AO1 3.5.5a

Question	Answers	Extra information	Mark	AO / Spec. Ref.
02.7	to start (the cell) dividing		1	AO1 3.5.5a

Question	Answers	Extra information	Mark	AO / Spec. Ref.
02.8	(sheep) P (reason) the genetic information / genes / DNA (only) comes from the nucleus **or** the genetic information / genes / DNA (only) comes from sheep P	 allow mark for the reason only if (sheep) P is given	1 1	AO3 3.5.5a AO2 3.5.1 3.5.1a 3.5.5a

Total			10

Question	Answers	Extra information	Mark	AO / Spec. Ref.
03.1	0.39 ÷ 0.06 (= 6.5) 6.5 × 20 130 **OR** 20 ÷ 0.06 (= 333.3') (1) 333.3' × 0.39 (1) 130 (1)		1 1 1	AO2 6.3 (3) 3.3.2 b

Question	Answers	Extra information	Mark	AO / Spec. Ref.
03.2	any **one** from: • takes too long (to count seeds) • (could) miscount number (of seeds) • seeds are too small (to count accurately)		1	AO4 3.3.2b 6.1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
03.3	any **one** from: • mass of seedlings / plants • thickness / diameter / width of stem • surface area / size / width of leaves	allow weight of seedlings / plants allow number of leaves (on stem)	1	AO4 3.3.2b 6.1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
03.4	any **two** from: • temperature • light • water (availability) • carbon dioxide (concentration) • nutrient (availability)	allow minerals / ions / nitrates if no other mark awarded allow rate of photosynthesis for **1** mark	2	AO1 3.2.1c 3.3.2a 3.3.2b

Question	Answers	Extra information	Mark	AO / Spec. Ref.
03.5	0.01 g		1	AO4 3.3.2b 6.4

Question	Answers	Extra information	Mark	AO / Spec. Ref.
03.6	increases decreases stays constant	must be in this order all correct for **2** marks allow **1** mark for one or two correct	2	AO3 3.3.2b

Question	Answers	Extra information	Mark	AO / Spec. Ref.
03.7	(from) 33 (mm to) 65 (mm)	allow (from) 65 (mm to) 33 (mm)	1	AO4 3.3.2b 6.4

Question	Answers	Extra information	Mark	AO / Spec. Ref.
03.8	(mean) length of stems in mm correct scaling (eg 20 and 40 and 60 and 80 added for every 10 small squares)	 allow equivalent scaling note only 2 values are required and zero is not essential	1 1	AO2 3.3.2b 6.3(9)

Question	Answers	Extra information	Mark	AO / Spec. Ref.
03.9	(Mass =) 0.15(0 g)		1	AO4 3.3.2b 6.4

Total			**14**

Question	Answers	Extra information	Mark	AO / Spec. Ref.
04.1	bacteria / virus	allow fungi / protists allow correctly named example eg Salmonella ignore microorganism / microbe / germ	1	AO1 3.4.7a 3.4.7b

Question	Answers	Extra information	Mark	AO / Spec. Ref.
04.2	in any order: (cause) damage / kill / destroy cells / tissues (produce) toxins / poison		1 1	AO1 3.4.7b

Question	Answers	Extra information	Mark	AO / Spec. Ref.
04.3	produce antitoxins by phagocytosis **or** engulf / ingest / digest pathogens / viruses / bacteria / microorganisms		1 1	AO1 3.4.7c

Question	Answers	Extra information	Mark	AO / Spec. Ref.
04.4	spread to more areas / wider distribution increase in numbers (of cases)	 allow use of data eg 59 more cases in June (compared to January)	1 1	AO3 3.4.7

Question	Answers	Extra information	Mark	AO / Spec. Ref.
04.5	165 – 17 = 148 17 ÷148 = 0.11486…. 0.115	 allow correct significant figures from an incorrectly calculated value	1 1 1	AO2 3.4.7 6.3(4,6)

Question	Answers	Extra information	Mark	AO / Spec. Ref.
04.6	**Level 2:** Scientifically relevant facts, events or processes are identified and given in detail to form an accurate account.		3-4	AO3 3.4.7e
	Level 1: Facts, events or processes are identified and simply stated but their relevance is not clear.		1-2	AO3 3.4.7e
	No relevant content		0	
	Indicative content Differences (after exposure to pathogen) for vaccinated horse: • greater number **or** higher concentration of antibodies produced • quantitative statement, eg 0.6 compared to 7.8 **or** 13 times higher • antibodies produced sooner / earlier • quantitative statement, eg after 1 day rather than 4 / 5 days **or** 3 / 4 days sooner • antibodies stay in higher concentration for longer • quantitative statement, eg still high / at 6 (arbitrary units) after 16 days compared to zero • the rate of antibody production was higher • quantitative statement, eg comparison of rate for level 2, the response must include reference to numerical data.			

Total			14

Question	Answers	Extra information	Mark	AO / Spec. Ref.
05.1	insulin		1	AO1 3.4.5b 3.4.5d

Question	Answers	Extra information	Mark	AO / Spec. Ref.
05.2	27.42 – 25.28 = 2.14 2.14 × 24.7 52.858 / 52.86 / 52.9 / 53 (%)		1 1 1	AO2 3.4.5de 6.3(3,13)

Question	Answers	Extra information	Mark	AO / Spec. Ref.
05.3	**Level 3:** A judgement, strongly linked and logically supported by a sufficient range of correct reasons, is given.		5-6	AO3 3.4.5de
	Level 2: A conclusion, supported by some relevant reasons is given.		3-4	AO3 3.4.5de
	Level 1: Relevant points are made. If there is a conclusion, this is asserted, but not logically linked to the points made.		1-2	AO3 3.4.5de
	No relevant content		0	
	Indicative content **For the Group 2 care plan:** • 10 times / 18% / 9 fewer patients with foot inflammation • 6 fewer ulcers • possibly 7 fewer / 0 ulcers if all patients had followed treatment plan properly • quantitative assessment that did not rely on ability of nurse to (subjectively) detect (small) changes in skin temperature • more frequent checks on the feet means less likely to miss problems **Against the Group 2 care plan:** • very tedious / may forget to take readings • accuracy of 1.5 °C means that temperature differences of 2.2 °C could go unnoticed and treatment not given • difficult for patient to take readings on their own feet / same place each time / using same method each time • patient needs to be able to accurately calculate and record the mean temperatures • false positive results could (needlessly) worry patient • relies on patient contacting the nurse to be effective • more nurses needed as the number of patients seeking treatment increases for level 3 there must be reasons both for and against the care plan.			

Total			**10**

Question	Answers	Extra information	Mark	AO / Spec. Ref.
06.1	(Tissue **A** =) xylem	allow phonetic	1	AO1 3.1.4a 3.2.2f
	(Tissue **B** =) phloem	allow phonetic	1	

Question	Answers	Extra information	Mark	AO / Spec. Ref.
06.2	(Tissue **A** =)			AO2 3.2.2f
	loss of end walls (and cytoplasm) for quick / continuous flow of water (and minerals)	allow it is a hollow tube for quick / continuous flow of water (and minerals)	1	
	thickened walls give support (to stem)	allow thickened walls keep the tubes open	1	
	(Tissue **B** =)			
	pores / (tiny) holes allow cytoplasm / (dissolved) sugars to flow from one cell to the next cell		1	
	transport requires energy which is made available by (the close contact to many) mitochondria		1	3.1.1a linking

Question	Answers	Extra information	Mark	AO / Spec. Ref.
06.3		allow (96 – 2) ÷12		AO2 3.2.2 6.3 (3,8)
	(96 – 2) ÷14	= 7.8(333….)	1	
	= 6.7(142….)		1	
	mm / hour		1	

Question	Answers	Extra information	Mark	AO / Spec. Ref.
06.4	less evaporation of water **or** less transpiration (because) smaller surface area of leaves **or** (because) fewer stomata	 ignore fewer leaves unqualified	1 1	AO4 3.2.2 6.1 6.4

Question	Answers	Extra information	Mark	AO / Spec. Ref.
06.5	any **three** from: • (rate) increases from 08.00 to 14.00 / for first 6 hours • fastest rate from 12.00 to 14.00 • greatest rate increase from 12.00 to 14.00 • (rate) decreases at a constant rate from 14.00 to 20.00 • (rate) is zero after 20.00	if no mark awarded allow rate increases then decreases for **1** mark allow fastest rate is 16.5 (mm per hour) allow greatest rate increase is 6.5 (mm per hour)	3	AO3 3.2.2

Question	Answers	Extra information	Mark	AO / Spec. Ref.
06.6	more light	allow warmer	1	AO3
	increases (rate of) photosynthesis		1	AO2
	(so) stomata become larger to take in (more) carbon dioxide **or** (so) stomata become larger to increase gas exchange	allow (more) stomata open to take in (more) carbon dioxide **or** allow (more) stomata open to increase gas exchange	1	AO2
	(and therefore) increased (rate of) water uptake to replace water lost by evaporation / transpiration		1	AO2 3.2.1c 3.2.2cd

Total			**18**

Question	Answers	Extra information	Mark	AO / Spec. Ref.
07.1	(Cell **B** =) 19 (Cell **C** =) 38 **or** 19 pairs	 allow correctly doubled answer from incorrect answer for Cell B	1 1	AO2 3.5.2hi

Question	Answers	Extra information	Mark	AO / Spec. Ref.
07.2	meiosis	correct spelling only	1	AO1 3.5.2g

Question	Answers	Extra information	Mark	AO / Spec. Ref.
07.3	the genetic information is copied the cell then divides twice (to form four gametes)	allow copying of chromosomes / DNA	1 1	AO1 3.5.2h

Question	Answers	Extra information	Mark	AO / Spec. Ref.
07.4	(man =) **Hh or H** and **h** (woman =) **hh or h** and **h** offspring genotypes correctly derived**:** **Hh Hh hh hh** identification of **hh** as having haemochromatosis **or** being affected and identification of **Hh** as not having hemochromatosis **or** not affected	allow alternative symbols **only** if defined allow (offspring) genotypes correct for student's parental genotypes / gametes	1 1 1 1	AO2 3.5.3g 3.5.4a

Question	Answers	Extra information	Mark	AO / Spec. Ref.
07.5	mother is homozygous dominant (for hemochromatosis) **or** mother can only pass on the H allele / dominant allele (for hemochromatosis) father is homozygous recessive **or** father can only pass on the h allele / recessive allele (for hemochromatosis) (this means that) children cannot inherit two h / recessive alleles (so cannot have hemochromatosis) **or** (this means that) children cannot be homozygous recessive (so cannot have hemochromatosis) **or** all children must be Hh **or** heterozygous and so do not have hemochromatosis		1 1 1	AO2 3.5.4a 3.5.3efg

Total			**12**