GCSE
BIOLOGY

PAPER 2H

Mark scheme

Specimen 2018

Version 0.1

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 1

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.1	(snake is) covered in sediment / mud **or** sinks into the mud		1	AO2/1 4.6.3.5
	(then) the soft parts decay / are eaten **or** bones / hard parts do not decay		1	AO2/1 4.6.3.5
	(so) minerals enter bones **or** bones are replaced by minerals		1	AO2/1 4.6.3.5
01.2	any **one** from: • changes to the environment • new predators • new diseases • new (more successful) competitors • catastrophic event / described event		1	AO1/1 4.6.3.6

Question 1 continues on the next page

Question 1 continued

Question	Answers	Extra information	Mark	AO / Spec. Ref.
01.3		allow converse if clearly describing Texas rat snake		
	(there are) many different coloured snakes	allow variation / mutations in snakes	1	AO1/1 4.6.3.1
	(the) green snakes are camouflaged **or** (the) green snakes are most suited to grassy / green environments		1	AO2/1 4.6.3.1
	(therefore they) get food **or** do not get eaten		1	AO1/1 4.6.3.1
	(so they) survive to breed **or** pass on the gene / allele / mutation (for green colouration)	ignore colour / characteristic being passed on	1	AO1/1 4.6.3.1
01.4	any **two** from: • challenged the idea that god made all living organisms • insufficient evidence (at the time) • mechanism of inheritance not known	accept DNA not discovered yet	2	AO1/1 4.6.3.1
01.5	(Jean Baptiste) Lamarck	allow phonetic spelling	1	AO1/1 4.6.3.1
Total			**10**	

Question 2

Question	Answers	Extra information	Mark	AO / Spec. Ref.
02.1	any **two** from: • to make amino acids • to make proteins • for growth	allow DNA or named protein / enzyme	2	AO1/1 4.4.1.3
02.2	horse (manure) closest to 30:1 (ratio) least cost **or** maximise his profit		 1 1	 AO3/2a 4.7.2.3 AO3/2b 4.7.2.3
02.3	(leaves are) broken down by microorganisms / decomposers / bacteria / fungi which respire **or** release carbon dioxide / CO_2 carbon dioxide / CO_2 is used in photosynthesis (in plants) forming glucose (to be used for growth)		1 1 1 1	AO1/1 4.7.2.2 AO1/1 4.7.2.2 AO1/1 4.7.2.2 AO1/1 4.7.2.2
02.4	any **three** from: • increased temperature • more oxygen available • more water / moisture • more microorganisms (that cause decay)		3	AO2/1 4.7.2.3
Total			**11**	

Question 3

Question	Answers	Extra information	Mark	AO / Spec. Ref.
03.1	choose parents that do not produce (much) Fel D1		1	AO2/1 4.6.2.3
	cross / breed parents		1	AO1/1 4.6.2.3
	choose offspring that do not produce (much) Fel D1		1	AO1/1 4.6.2.3
	cross / breed them over many generations		1	AO1/1 4.6.2.3
03.2	(animals are) more prone to disease **or** defect		1	AO1/1 4.6.2.3
Total			**5**	

Question 4

Question	Answers	Extra information	Mark	AO / Spec. Ref.
04.1	put spores on bread		1	AO2/2 4.7.2.3
	place in sealable bags		1	AO2/2 4.7.2.3
	leave in different temperatures - fridge, room, incubator		1	AO2/2 4.7.2.3
	after a set time, estimate / measure percentage cover of mould on each piece of bread		1	AO2/2 4.7.2.3
04.2	wear a face mask	allow wear gloves	1	AO1/2 4.7.2.3
04.3	any **one** from: • type of mould • amount of mould (put on each piece of bread) • amount of air in the plastic bags • size of the pieces of bread		1	AO2/2 4.7.2.3
04.4	10.4	ecf for incorrectly read figures allow **1** mark for 52/5	2	AO2/2 4.7.2.3
04.5	(decomposition occurs at a faster rate when the temperature is higher **or** amount of decomposition is higher when temperature is higher		1	AO3/2b 4.7.2.3
Total			**9**	

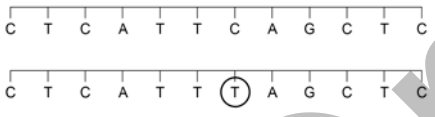
Question 5

Question	Answers	Extra information	Mark	AO / Spec. Ref.
05.1	pupils dilated (at **B**)	allow converse for **A**	1	AO2/1 4.5.2.3
	in dim light / low light levels		1	AO1/1 4.5.2.3
	because circular muscles (in iris) relax		1	AO2/1 4.5.2.3
	(and) radial muscles contract		1	AO2/1 4.5.2.3
05.2	lens bends the light	allow refraction	1	AO1/1 4.5.2.3
	so that light focuses on the retina		1	AO1/1 4.5.2.3
Total			**6**	

Question 6

Question	Answers	Extra information	Mark	AO / Spec. Ref.
06.1	drop the ruler from the same height each time	allow description of holding bottom edge of ruler opposite the catcher's thumb	1	AO3/3a 4.5.2.1
	use the same hand to catch the ruler		1	AO3/3a 4.5.2.1
06.2	117		1	AO2/2 4.5.2.1
06.3	0.15	allow **2** marks for 0.49 allow **2** marks for 0.02 allow **1** mark for 0.24	3	AO2/1 4.5.2.1
06.4	no indication when the colour will change **or** you might be able to tell when the person is about to drop the ruler		1	AO3/2a 4.5.2.1
	measurement of time is more precise **or** resolution (of computer timer) is higher		1	AO3/2a 4.5.2.1
06.5	cerebral cortex	ignore identified lobes	1	AO2/2a 4.5.2.2
06.6	cerebellum		1	AO2/2a 4.5.2.2
Total			**10**	

Question 7

Question	Answers	Extra information	Mark	AO / Spec. Ref.
07.1	25 (minutes)	allow **1** mark for six divisions / 150/6	2	AO2/1 4.6.1.1
07.2	different genes from each parent	allow mixing of genetic information	1	AO1/1 4.6.1.1
07.3	phosphate		1	AO1/1 4.6.1.5
07.4	t / thymine	additional letters or bases negates mark	1	AO1/1 4.6.1.5
07.5			1	AO3/1a 4.6.1.5

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Question 7 continued

Question	Answers	Extra information	Mark	AO / Spec. Ref.
07.6	(mutation) changes the base code **or** there is a change in the three bases		1	AO1/1 4.6.1.5
	(mutation) changes the amino acid		1	AO1/1 4.6.1.5
	(this could) change the protein		1	AO1/1 4.6.1.5
	(so it) forms a different shape	accept different tertiary structure	1	AO1/1 4.6.1.5
	(therefore) the enzyme no longer fits the substrate / carbohydrate		1	AO1/1 4.6.1.5
07.7	mother / woman's gametes correct: A a		1	AO2/2 4.6.1.6
	father / man's gametes correct: a a		1	AO2/2 4.6.1.6
	correct derivation of offspring	ecf	1	AO2/2 4.6.1.6
	identification of child with syndrome H or genotype aa		1	AO2/2 4.6.1.6
	0.5	ecf allow 50% / 1/2 / 1 in 2 / 1:1 do **not** accept 1:2	1	AO3/3b 4.6.1.6
Total			**16**	

Question 8

Question	Answers	Extra information	Mark	AO / Spec. Ref.
08.1	pigs cannot move freely		1	AO2/1 4.7.5.2
	(and they are) kept inside / in a temperature controlled environment **or** heated environment		1	AO1/1 4.7.5.2
	(therefore) less energy / heat lost in controlling body temperature **or** less energy required for movement		1	AO1/1 4.7.5.2
	(so) more energy is available for growth		1	AO2/1 4.7.5.2
08.2	any **two** from: • diseases spread more rapidly • antibiotics can build up in the food chain • increased use of fossil fuels (to heat the barn)		2	AO3/1b 4.7.5.2
08.3	81 / 81.49 / 81.5	allow **1** mark for 295/362	2	AO2/2 4.7.5.2
08.4	aboriginal people can eat other foods (so they may not be in food insecurity)		1	AO3/1b 4.7.5.2
	we do not know if other (traditional) food sources have declined		1	AO3/1b 4.7.5.2
Total			**10**	

Question 9

Question	Answers	Extra information	Mark	AO / Spec. Ref.
09.1	if too high <u>insulin</u> released from pancreas		1	AO1/1 4.5.3.2
	so glucose is moved into cells		1	AO1/1 4.5.3.2
	if too low, <u>glucagon</u> is released (from pancreas)		1	AO1/1 4.5.3.2
	causes glycogen to be converted to glucose <u>and</u> released into the blood	allow glucose is stored	1	AO1/1 4.5.3.2
09.2	(type 1) not enough / no insulin produced		1	AO1/1 4.5.3.2
	(type 2) cells do not respond to insulin		1	AO1/1 4.5.3.2
09.3	not enough glycogen / glucose (in body)		1	AO2/1 4.5.3.2
	for respiration / energy		1	AO2/1 4.5.3.2
	so fats / protein / muscle used (instead)		1	AO2/1 4.5.3.2
09.4	could be other reasons for glucose in urine **or** blood test gives current level, urine levels might be several hours old **or** not always glucose in urine		1	AO3/1a 4.5.3.2

Question 9 continues on the next page

Question 9 continued

Question	Answers	Extra information	Mark	AO / Spec. Ref.
09.5	results not affected by glucose from food **or** 8 hours is sufficient time for insulin to have acted on any food eaten **or** so that there is a low starting point to show the effect		1	AO2/1 4.5.3.2
09.6	(patient **A**)	no mark for identifying **A**		
	glucose level much higher (than **B**)		1	AO3/2a 4.5.3.2
	and remains high / does not fall		1	AO3/2a 4.5.3.2
Total			**13**	

Question 10

Question	Answers	Extra information	Mark	AO / Spec. Ref.
10.1	raises BMR		1	AO1/1 4.5.3.7
	stimulates protein synthesis		1	AO1/1 4.5.3.7
	for growth		1	AO1/1 4.5.3.7
10.2	causes eggs to mature		1	AO1/1 4.5.3.4
	stimulate ovaries to produce oestrogen		1	AO1/1 4.5.3.4
10.3	dip / drop in progesterone levels		1	AO2/1 4.5.3.4
	(so) FSH is not inhibited anymore		1	AO2/1 4.5.3.4
	(so) LH is not inhibited anymore		1	AO2/1 4.5.3.4
	(therefore) an egg is matured and released		1	AO3/1b 4.5.3.4
Total			**9**	

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