GCSE
BIOLOGY

PAPER 2F

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	**A**		1	AO1/1 4.6.1.4
01.2	23		1	AO1/1 4.6.1.8
01.3	23	do **not** accept 23 pairs	1	AO1/1 4.6.1.2
01.4	both x's under mother circled	accept if clearly indicated choice even if not circled	1	AO1/1 4.6.1.8
01.5	XY	allow YX	1	AO1/1 4.6.1.8
01.6	50 (%)		1	AO2/1 4.6.1.8
Total			**6**	

Question 2

Question	Answers	Extra information	Mark	AO / Spec. Ref.
02.1	(sun)light		1	AO1/1 4.4.1.1 4.7.4.3
02.2	snail **or** shrew	additional incorrect answer negates correct answer	1	AO2/1 4.7.2.1 4.7.4.1
02.3	shrew	additional incorrect answer negates correct answer	1	AO2/1 4.7.2.1 4.7.4.1
02.4	fewer shrews to eat them		1	AO2/1 4.7.4.1
02.5	**C**		1	AO3/2a 4.7.4.2
02.6	1100 (kJ)		1	AO2/2 4.7.4.3
02.7	the snail does not eat the roots of the lettuce		1	AO2/1 4.7.4.3
02.8	any **two** from: • light intensity • temperature • moisture (levels) • soil pH • mineral content of soil • wind intensity • carbon dioxide levels • oxygen levels	ignore wind direction	2	AO1/1 4.7.1.2
Total			**9**	

Question 3

Question	Answers	Extra information	Mark	AO / Spec. Ref.
03.1	use (a) random number(s) (generator) **or** use coordinates method explained		1	AO3/3b 4.7.2.1
03.2	compare their results with another student's results place more quadrats		1 1	AO3/3b 4.7.2.1 AO3/3b 4.7.2.1
03.3	80	allow 80.0 check **Table 1** for answer	1	AO2/2 4.7.2.1
03.4	8000	allow ecf from answer in **03.3**	1	AO2/1 4.7.2.1
03.5	22		1	AO2/1 4.7.2.1
03.6	(quadrat) 5 very few or only 2 growing (here)	both quadrat number and correct reason must be given for **1** mark	1	AO3/2b 4.7.2.1
Total			**7**	

Question 4

Question	Answers	Extra information	Mark	AO / Spec. Ref.
04.1	liver		1	AO1/1 4.5.3.2
04.2	insulin	ignore glucagon	1	AO1/1 4.5.3.2
04.3	skin		1	AO1/1 4.5.2.4
04.4	kidney		1	AO1/1 4.5.3.3
04.5	via the lungs	allow through exhalation	1	AO1/1 4.5.3.3
	as sweat **or** through skin		1	AO1/1 4.5.3.3
Total			**6**	

Question 5

Question	Answers	Extra information	Mark	AO / Spec. Ref.
05.1	1210		1	AO2/2 4.7.3.4
05.2	the local people decided to farm cattle a company starts growing plants for biofuel		1 1	AO2/1 4.7.3.4 AO2/1 4.7.3.4
05.3	carbon dioxide photosynthesis	in this order only	1 1	AO2/1 4.7.3.4 AO2/1 4.7.3.4
05.4	animals and birds migrate because there is less food there is less biodiversity		1 1	AO1/1 4.7.3.5 AO1/1 4.7.3.5
05.5	any **one** from: • breeding programmes (for endangered species) • regeneration (programmes) • reintroduction of field margins / hedgerows • awareness raising with politicians / public • recycling		1	AO1/1 4.7.3.6
Total			**8**	

Question 6

Question	Answers	Extra information	Mark	AO / Spec. Ref.
06.1	grown down	allow longer	1	AO2/1 4.5.4.1
	towards gravity / gravitropism	allow geotropism	1	AO2/1 4.5.4.1
06.2	grow up		1	AO2/1 4.5.4.1
	towards the light	allow phototropism	1	AO2/1 4.5.4.1
06.3	3		1	AO3/1a 4.5.4.1
06.4	repeat the experiment		1	AO2/2 4.5.4.1
06.5	initiates germination		1	AO3/3a 4.5.4.2
Total			**7**	

Question 7

Question	Answers	Extra information	Mark	AO / Spec. Ref.
07.1	pituitary adrenal		1 1	AO1/1 4.5.3.4 AO1/1 4.5.3.1
07.2	ovary		1	AO1/1 4.5.3.4
07.3	diaphragm	allow phonetic spelling	1	AO3/2a 4.5.3.5
07.4	condom		1	AO2/1 4.5.3.5
07.5	any **one** from: • plastic IUD releases a hormone whereas copper IUD releases copper • copper kills sperm but thicker mucus makes it harder for sperm to swim using plastic IUD		1	AO3/1a 4.5.3.5
07.6	copper IUD prevents pregnancy for longer / 10 years not 5 copper IUD can be used as emergency contraception whereas plastic IUD cannot	answers must be comparative	1 1	AO3/2a 4.5.3.5 AO3/2a 4.5.3.5

Question 7 continues on the next page

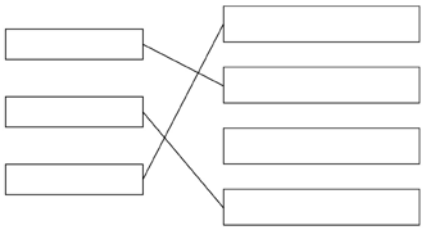
Question 7 continued

Question	Answers	Extra information	Mark	AO / Spec. Ref.
07.7	any **three** from: **disadvantage of copper** • more painful periods • longer or heavier periods **advantage of copper** • less side effects (overall) • does not cause cysts / mood swings	accept converse for plastic IUD answers must be comparative max 2 if only advantages or disadvantages given	3	AO3/1b 4.5.3.5
Total			**11**	

Question 8

Question	Answers	Extra information	Mark	AO / Spec. Ref.
08.1	both use their dominant arm	allow description of dominance	1	AO2/2 4.5.2.1
08.2	9	allow 9.0	1	AO2/2 4.5.2.1
08.3	2 (in test number 6)		1	AO3/1a 4.5.2.1
08.4	12		1	AO3/2 4.5.2.1
08.5	11	allow 11.0 allow **1** mark for 77/7 with no subsequent step	2	AO2/2 4.5.2.1
08.6	0.13		1	AO2/2 4.5.2.1
08.7	carry out more repeats		1	AO3/3b 4.5.2.1
08.8	caffeine reduces reaction time		1	AO3/2b 4.5.2.1
Total			**9**	

Question 9

Question	Answers	Extra information	Mark	AO / Spec. Ref.
09.1			1 1 1	AO1/1 4.6.3.1 AO1/1 4.6.3.2 AO1/1 4.6.3.3
09.2	a gene	allow allele	1	AO1/1 4.6.1.4
09.3		allow mark if the changed base is clearly indicated	1	AO3/1a 4.6.1.5
09.4	4		1	AO3/1a 4.6.1.5
09.5	correct derivation of children's genotypes identification of children with cystic fibrosis (dd) 0.25	 allow ecf allow ¼ / 25% / 1 in 4 / 1:3 do **not** accept 1:4	1 1 1	AO2/1 4.6.1.6 AO3/1b 4.6.1.6 AO2/1 4.6.1.6
09.6	heterozygous		1	AO2/1 4.6.1.6
Total			**10**	

Question 10

Question	Answers	Extra information	Mark	AO / Spec. Ref.
10.1	(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
10.2	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 10 continues on the next page

Question 10 continued

Question	Answers	Extra information	Mark	AO / Spec. Ref.
10.3		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
10.4	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
10.5	(Jean Baptiste) Lamarck	allow phonetic spelling	1	AO1/1 4.6.3.1
Total			**11**	

Question 11

Question	Answers	Extra information	Mark	AO / Spec. Ref.
11.1	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
11.2	horse (manure)			
	closest to 30:1 (ratio)		1	AO3/2a 4.7.2.3
	least cost **or** maximise his profit		1	AO3/2b 4.7.2.3
11.3	(leaves are) broken down by microorganisms / decomposers / bacteria / fungi		1	AO1/1 4.7.2.2
	which respire **or** release carbon dioxide / CO_2		1	AO1/1 4.7.2.2
	carbon dioxide / CO_2 is used in photosynthesis (in plants)		1	AO1/1 4.7.2.2
	forming glucose (to be used for growth)		1	AO1/1 4.7.2.2
11.4	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 12

Question	Answers	Extra information	Mark	AO / Spec. Ref.
12.1	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
12.2	(animals are) more prone to disease **or** defect		1	AO1/1 4.6.2.3
Total			**5**	

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