OXFORD
INTERNATIONAL
AQA EXAMINATIONS

INTERNATIONAL GCSE BIOLOGY 9201/2

Paper 2

Mark Scheme
November 2020

Version: 1.0 Final mark scheme

18BY92020/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.

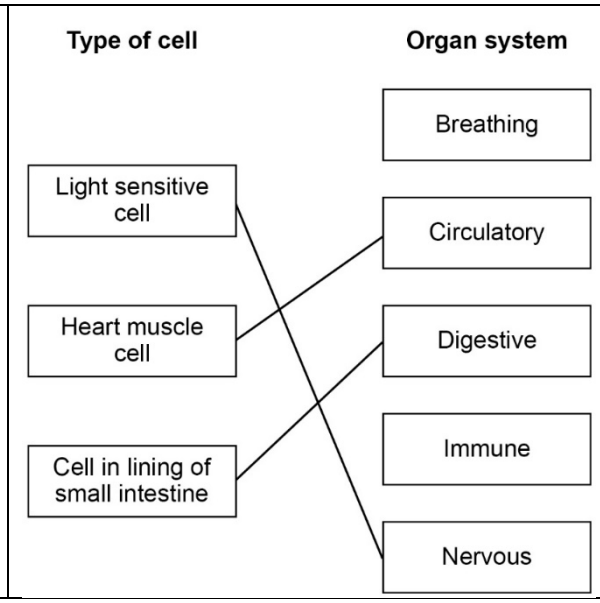
An answer which contains nothing of relevance to the question must be awarded no marks.

Question	Answers	Extra information	Mark	AO/Spec. Ref.
01.1	type 2 diabetes		1	AO3 3.4.5e
01.2	lose / control weight	allow correct ways to reduce risk of other diseases if named in question 1.1 allow correct descriptions of how this might be achieved ignore healthy diet or diet unqualified	1	AO2 3.4.5e
01.3	glucose oxygen		1 1	AO1 3.2.6h
01.4	lactic acid		1	AO1 3.2.6i,l
01.5	mass (lifted)		1	AO4 3.2.6 6.2 RP4
01.6	any **two** from: • (use of) same arm • rest time **or** rest for 5 minutes • distance mass lifted **or** mass lifted to shoulder **or** same exercise • rate of lifting **or** lift every 2 seconds	ignore time (taken) unqualified	2	AO4 3.2.6 6.2 RP4

01.7	the greater the mass the shorter the time time (for the arm to become fatigued) reduced at an increasing rate correct **use** of comparative data from table	allow as mass increases the faster the muscle fatigues allow negative correlation **or** inverse relationship	1 1 1	AO2 AO3 3.2.6 6.2 RP4 6.3(3,12)

01.8	any **two** from: • different age • different gender • different fitness (of student) • different muscle mass / physique • different judgment of pain or pain threshold	allow exercises regularly allow stronger	2	AO4 3.2.6 6.2 RP4

Total			**13**

Question	Answers	Extra information	Mark	AO/Spec. Ref.
02.1		one mark per correct response more than one line from a type of cell will cancel the mark	3	AO2 3.1.1d
02.2	**A =** red (blood cells) / RBC **B =** white (blood cells) / WBC	allow erythrocytes allow leucocytes / lymphocytes / neutrophils / granulocytes	1 1	AO1 3.2.3n,o
02.3	to start blood clotting		1	AO1 3.2.3p
02.4	pathogens		1	AO1 3.4.7a
02.5	$\frac{7.4 + 7.6 + 7.3 + 7.5 + 7.4}{5}$ 7.4 / 7.44	an answer of 7.4 / 7.44 scores **2** marks	1 1	AO2 3.4.7f 6.3(7)

02.6	any **two** from: • (sore throat / mild infection) might be caused by a virus **or** antibiotics do not kill viruses • (sore throat / mild infection) will get better due to immune system / white blood cells • (antibiotics) may increase the rate of development of resistance in microorganisms (if overused)		2	AO2 3.4.7c,g,i

Total			**11**

Question	Answers	Extra information	Mark	AO/Spec. Ref.
03.1		an answer of 167 / 166.7 / 166.66…7 scores **4** marks an answer of 166.666…6 scores **3** marks		AO2 3.3.4 6.3(3,11)
	20 and 7.5		1	
	(20 – 7.5) = 12.5 (millions of tonnes)	allow calculation based upon incorrect graph readings	1	
	$\frac{12.5}{7.5}$ x 100		1	
	167 / 166.6• / 166.7 / 166.66(66…7)		1	
03.2	any **two** from: (palm fruit) • has the greatest yield		2	AO2 AO3 3.3.4 6.3(2,3)
	• 370 (tonnes / km^2) more than soya bean	allow 10 / 10.74 / 11 times more than soya bean		
	• 348 (tonnes / km^2) more than sunflower seed	allow 6 / 6.8 / 7 times more than sunflower		
	• 333 (tonnes / km^2) more than rapeseed	allow 5 / 5.44 times more than rapeseed		
03.3	66	allow value in range of 65 to 67	1	AO2 3.3.4c 6.3(11)

03.4	any **one** from: • may produce substances useful to humans • duty to preserve for future generations / children / offspring • effect on other organisms eg food chain effects	allow substances / food	1	AO3 3.3.4c

03.5	**Level 3:** Relevant points (reasons/causes) are identified, given in detail and logically linked to form a clear account.	5 - 6	AO3 3.3.4abcd
	Level 2: Relevant points (reasons/causes) are identified, and there are attempts at logically linking. The resulting account is not fully clear.	3 - 4	AO3 3.3.4abcd
	Level 1: Points are identified and stated simply, but their relevance is not clear and there is no attempt at logical linking.	1 - 2	AO3 3.3.4abcd
	No relevant content	0	
	Indicative content <u>Advantages of palm oil:</u> • versatile / many uses • high(est) yield (per km^2 of land) / efficient use of land • cheap to produce / (highly) profitable • biofuel is a renewable resource • biofuel causes less pollution to the environment or explained • jobs (for local people) • helps local economy <u>Disadvantages of palm oil:</u> • reference to deforestation • (which) increases carbon dioxide in atmosphere • slash and burn / burning of trees increases carbon dioxide in atmosphere • less carbon dioxide taken in / locked up (by trees) • less photosynthesis (as fewer trees) • carbon dioxide given off by machinery / lorries • carbon dioxide given off when palm oil is used as a fuel • reference to global warming		

	• animals and birds migrate / loss of biodiversity • less food available for other organisms **or** less land for crops (for local people) • habitats destroyed • land degraded or minerals lost from soil • toxic chemicals / fertilisers / pesticides / herbicides (used on palm oil plantations) pollute soil / water • villages destroyed / (indigenous) people lose their homes / government seizes land Advantages and disadvantages are required for Level 2		

Total			**14**

Question	Answers	Extra information	Mark	AO/Spec. Ref.
04.1	water / H_2O through the root / root hairs **or** by osmosis carbon dioxide / CO_2 through the leaf / stomata **or** by diffusion	ignore mineral ions / phloem / xylem allow in the transpiration stream do **not** accept active transport	1 1 1 1	AO1 3.2.1a,b. 3.2.2a
04.2	chlorophyll	ignore chloroplast	1	AO1 3.2.1b
04.3	any **one** from: • change the distance of the lamp (from the plant) • use light bulbs with different output powers	 allow different wattages / voltage / current	1	AO4 3.2.1 6.2RP2
04.4	lamp increases the temperature **or** temperature can affect the rate of photosynthesis the beaker of water controls the temperature	allow lamp gives out heat	1 1	AO4 3.2.1 6.2RP2

	or the beaker of water helps to keep the temperature constant			

04.5	number of bubbles **or** volume of gas / oxygen (given off) (for a set amount of) time / named time interval	allow count number of bubbles per minute for **2** marks do **not** accept amount of oxygen	1 1	AO4 3.2.1 6.2RP2

04.6	a higher light intensity does not increase the rate of photosynthesis	allow the rate of photosynthesis stops increasing / stays the same (at 50 000 lux / after 40 000 lux)	1	AO3 3.2.1c 6.2RP2

04.7	any **two** from: • carbon dioxide (concentration) • temperature • (amount of) chlorophyll / chloroplasts		2	AO2 3.2.1c 6.2RP2

04.8	all points plotted correctly line of best fit	allow **1** mark for 3 or 4 correct plots	2 1	AO2 3.2.1 6.2RP2 6.3(9)

04.9	(plant / chlorophyll) only absorbs 8% of light (at 550 nm) this means less <u>energy</u> is available / absorbed (for photosynthesis)	allow absorbs (very) little / least light (at 550 nm)	1 1	AO3 3.2.1 6.2RP2 6.3(11,12)

Total			**18**

Question	Answers	Extra information	Mark	AO/Spec. Ref.
05.1	arrow for carbon dioxide (from blood capillary) to air **and** arrow for oxygen from air (to blood capillary)		1	AO2 3.2.5a
05.2	diffusion		1	AO1 3.1.5a,b
05.3	any **two** from: (frog does not have:) • bronchioles • ribcage • diaphragm (frog has:) • fewer alveoli • less distinct alveoli	allow converse for human allow intercostal muscles	2	AO3 3.2.5a
05.4	(stage 1:) jaw is lowered which reduces the pressure (in the mouth cavity) so air enters (through open nostril) (stage 2:) jaw is raised which increases pressure (in the mouth cavity) (stage 3:) the glottis is opened as air is forced / pushed into the lungs	if no other marks awarded allow **1** mark for by positive pressure ventilation	1 1 1	AO2 3.2.5a,b

05.5	nerves / neurones from the brain are damaged / severed (so) stop / no impulses / signal (from brain) to diaphragm / intercostal muscles (so) these (muscles) will not contract (to allow air to be breathed in)		1 1 1 1	AO2 3.2.5b 3.4.1c,d,e

05.6	**Level 2:** Scientifically relevant facts, events or processes are identified and given in detail to form an accurate account.	**3-4**	AO3 3.2.5d
	Level 1: Facts, events or processes are identified and simply stated but their relevance is not clear.	**1-2**	AO2 3.2.5d
	No relevant content	**0**	
	Indicative content <u>Inspiration:</u> • air pumped out / withdrawn from chamber • chest wall expands / ribs move up (and out) • pressure in lungs lower than in air (surrounding body) • air drawn into lungs <u>Expiration:</u> • air moves / pumped (back) into chamber • chest wall / ribs move down • pressure in lungs higher than in air (surrounding body) • air leaves / forced out of lungs		

05.7	any **two** from: • operator will tire **or** must be present at all times • air pressure not regulated • (operator may give) too much **or** too little air • damage to lungs may occur • can only be used on a temporary basis • the seal around the nose and mouth is not good so air escapes	allow needs to do manually	2	AO3 3.2.5d

Total			**17**

Question	Answers	Extra information	Mark	AO/Spec. Ref.
06.1	any **one** from: • spinal cord • pancreas		1	AO1 3.4.2d
06.2	(**A** / blood vessel) constricts / narrows **or** muscle (in wall of A) contracts	do **not** accept gets smaller **or** veins / capillaries constricting **or** blood vessels moving	1	AO1 AO2 3.4.4d
	(so) less blood flows near skin surface **or** less blood flows through capillaries		1	
	(and therefore) less energy is lost / radiated / transferred (to the environment)	allow heat for energy	1	
06.3	more (water) lost from skin in sweat	allow converse if clearly describing cold day	1	AO2 AO3 3.4.4d
	(so) more evaporation (of sweat / water) to cool blood / body		1	3.4.3a,b,d 3.4.2e
	(therefore) more water reabsorbed by kidney(s)		1	
	(and so) less lost through bladder **or** less lost in urine		1	
	to keep water content of the body (relatively) constant		1	

06.4	respiration aerobic	aerobic respiration scores **2** marks allow using oxygen	1 1	AO1 3.2.6c

06.5	(long tubules) allow more time / surface (area) for water to be reabsorbed (so) more water returns to the blood (so) less water is lost in the urine **or** (so) more water is retained by the mammal / body		1 1 1	AO2 AO3 3.4.3a,d

06.6	(when sodium ions are too low aldosterone is released:) aldosterone causes the kidneys to lose fewer sodium ions in the urine **or** aldosterone causes the kidneys to reabsorb more sodium ions (so) sodium ion concentration in the blood increases (this is detected and) the production of aldosterone is reduced / stopped		1 1 1	AO2 AO3 3.4.3b,d,g 3.4.2e

Total			**17**