



## EXAM PAPERS PRACTICE

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## International IGCSE Biology Past Papers

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# INTERNATIONAL

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# BIOLOGY



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PAPER 1

Mark scheme

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Specimen material

MARK SCHEME – INTERNATIONAL IGCSE BIOLOGY –  
PAPER 1 – SPECIMEN MATERIAL



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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.

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## 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	makes/produces/synthesises protein/enzyme		1
01.2	plant cell has nucleus/ vacuole/chloroplasts/ chlorophyll  or plant cell is <b>much</b> larger	'it' = plant cell allow correct reference to DNA or chromosomes allow plant cell has fewer ribosomes allow cellulose (cell wall)	1
01.3	$\frac{2 \times 50,000}{500}$ or $\frac{100,000}{500}$ 200	allow 200 with no working shown for <b>2</b> marks	1  1
01.4	bacterial cell is too small/ bacterial cell about same size as a mitochondrion/'no room'	ignore references to respiration	1



<b>01.5</b>	(long tail) moves the sperm/ allows the sperm to swim towards the egg		1
		allow correct reference to other named parts of the female reproductive system	1
	(mitochondria) release <b>energy</b> (for movement / swimming)	allow supply/produce/provide	1
	in respiration		1
<b>01.6</b>	contain half the (number of) chromosomes <b>or</b> contains one set of chromosomes <b>or</b> contains 23 chromosomes		1
<b>Total</b>			<b>10</b>



## Question 2

Question	Answers	Extra information	Mark
02.1	food molecules in plants		1
02.2	2(.0) 8(.0)		1 1
02.3	3 layers of decreasing size as they go up labelled Plant, Reptile, Bird in <b>correct order of food chain</b> sizes correct (showing half on each side)	error $\pm$ half square	1 1 1
02.4	any <b>two</b> from: <ul style="list-style-type: none"><li>not all the reptiles are eaten</li><li>not all parts of eaten reptiles are absorbed/ some passed as faeces (of bird)</li><li>due to respiration (of birds) /production of CO<sub>2</sub>.</li></ul>	allow reference to uric acid/ urea/urine (of buzzards) reference to waste/excretion alone gains 1 mark	2
02.5	any <b>two</b> from: <ul style="list-style-type: none"><li>cannot find all plants / too many to count</li><li>reptiles hiding <b>or</b> under shrubs/rocks</li><li>birds/reptiles come and go all the time.</li></ul>	allow count an organism more than once	2
<b>Total</b>			<b>10</b>





## Question 3

Question	Answers	Extra information	Mark
03.1	guard cells		1
03.2	any <b>one</b> from: <ul style="list-style-type: none"><li>allow carbon dioxide to enter</li><li>allow oxygen to leave.</li></ul>	allow control loss/evaporation of water <b>or</b> control transpiration rate allow gaseous exchange	1
03.3	any <b>one</b> from: <ul style="list-style-type: none"><li>species/plant</li><li>length of time.</li></ul>	ignore temperature and size of leaves	1
03.4	$\frac{1.6 - 1.28}{1.6} \times 100$ or $\frac{0.32}{1.6} \times 100$ 20	allow 20 with no working shown for <b>2</b> marks	1 1
03.5	the lower surface has most stomata/ stomata covered (by grease) so water cannot escape/ evaporate from the stomata	allow blocked for covered ignore waterproof to gain full credit stomata must be mentioned at least once	1 1
03.6	hot dry/low humidity wind(y)	ignore bright/sunny	1 1 1
<b>Total</b>			<b>10</b>



## Question 4

Question	Answers	Extra information	Mark
04.1	A		1
04.2	diffusion	do <b>not</b> accept osmosis	1
04.3	C movement (of molecules) against a concentration gradient	do <b>not</b> accept reference to osmosis	1 1
04.4	any <b>six</b> from: distilled water: <ul style="list-style-type: none"><li>• correct use of <b>hypotonic</b></li><li>• <b>water</b> has entered the cell</li><li>• by osmosis (once only)</li><li>• from dilute to more concentrated solution (once only)</li><li>• via partially permeable membrane (once only)</li><li>• the cell is <b>turgid</b>.</li></ul> strong sugar solution: <ul style="list-style-type: none"><li>• correct use of <b>hypertonic</b></li><li>• <b>water</b> left the cells</li><li>• by osmosis (once only)</li><li>• from dilute to more concentrated solution (once only)</li><li>• via partially permeable membrane (once only)</li><li>• so cell membrane shrank away from cell wall</li><li>• the cell is <u>plasmolysed</u>.</li></ul>		6
<b>Total</b>			<b>10</b>



## Question 5

Question	Answers	Extra information	Mark
05.1	bladder		1
	liver		1
05.2	$100 - (1.9 + 1.4)$		1
	96.7	allow 96.7 with no working shown for 2 marks	1
05.3	glucose passes through the filter/from plasma to filtrate	ignore reference to diffusion	1
	glucose is reabsorbed <b>or</b> glucose taken back into the blood	ignore filtered	1
05.4	protein (molecules) are (too) large (to pass through the filter)		1
05.4	protein (molecules) are (too) large (to pass through the filter)		1
05.5	any <b>three</b> from: <ul style="list-style-type: none"><li>• <b>blood</b> becomes more concentrated / too salty / has lower water potential <b>or</b> too little water in the <b>blood</b></li><li>• hypothalamus detects this</li><li>• release of ADH by pituitary</li><li>• increased <b>reabsorption</b> of water.</li></ul>		3
<b>Total</b>			<b>10</b>



## Question 6

Question	Answers	Extra information	Mark
06.1	in blood or the circulation system or plasma	allow arteries and veins <b>or</b> blood vessels do <b>not</b> accept slowly <b>or</b> in blood cells	1
06.2	glands	allow endocrine glands <b>or</b> endocrine do <b>not</b> accept a named gland	1
06.3	pancreas	allow phonetic spelling	1
06.4	4(.0) to 7.2 or 7.2 to 4(.0)		1
06.5	digestion of carbohydrates or absorption from small intestine		1
06.6	glycogen		1
06.7	lipid/fat		1



06.8			✓	1
		✓		1
		✓		1
<b>Total</b>				<b>10</b>

Question 7

Question	Answers	Extra information	Mark
07.1	receptors (in brain)	accept hypothalamus / thermoregulatory centre	1
	(receptors sensitive to/measures) temperature of <b>blood</b>		1
07.2	receptors (in skin) send information/signals/impulses/ messages to brain/ thermoregulatory centre		1
07.3	sweat released		1
	cannot evaporate because of high humidity/all the water vapour in the air		1
	so less heat lost/less cooling <b>or</b> it is evaporation of sweat that cools the body		1



<b>07.4</b>	blood vessels supplying (skin) capillaries		<b>1</b>
	<b>or</b> arteries/arterioles  dilate/widen	allow vasodilation  do <b>not</b> accept idea of blood vessels moving	<b>1</b>
<b>07.5</b>	muscles <b>contract</b>	ignore relax/expand	<b>1</b>
	increased respiration <b>or</b> more heat released	allow more heat produced allow respiration releases/ produces heat	<b>1</b>
<b>Total</b>			<b>10</b>



## Question 8

Question	Answers	Extra information	Mark
08.1	nucleus		1
08.2	produce antitoxins engulf/ingest/digest pathogens/viruses/ bacteria/microorganisms	allow phagocytosis or description ignore eat/consume/absorb for engulf ignore references to memory cells	1 1
08.3	dead/inactive/weakened (measles) pathogen/virus	allow idea of antigen/protein ignore bacteria	1 1
08.4	(after infection) rise begins sooner/less lag time steeper/faster rise (in number) longer lasting <b>or</b> doesn't drop so quickly	allow converse if clearly referring to before vaccination  allow idea of staying high for longer  ignore reference to higher starting point	1 1 1
08.5	antibodies are specific <b>or</b> needs different antibodies	allow antigens are different <b>or</b> white blood cells do not recognise virus	1
08.6	reduces <b>spread</b> of infection/ less likely to get an epidemic	allow idea of eradicating measles	1
<b>Total</b>			<b>10</b>



Question 9

Question	Answers	Extra information	Mark
09.1	long neck <b>or</b> long legs		1
09.2	change in environment <b>or</b> reaching for food <b>or</b> stretching led to <b>more use</b> of neck (and legs)  use led to <b>increased size</b> <b>or</b> characteristic acquired during lifetime  this characteristic was passed to offspring		1  1  1
09.3	phenotypic changes do not affect genotype <b>or</b> genes  acquired characteristics are not passed to offspring <b>or</b> the offspring were born with tails <b>or</b> inheritance has to be genetic		1  1





<b>09.4</b>	variation exists in all populations <b>or</b> mutation occurred		1
	some individuals will have an advantage in certain areas <b>or</b> will be better adapted <b>or</b> there is survival of fittest		1
	advantaged individuals breed more <b>or</b> are more successful		1
	the <b>genes or</b> units of heredity <b>or</b> DNA of these individuals are passed on		1
<b>Total</b>			<b>10</b>