Cambridge Assessment International Education

Cambridge IGCSE™

BIOLOGY **0610/32**

Paper 3 Theory (Core) **May/June 2022**

MARK SCHEME

Maximum Mark: 80

Published

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge International will not enter into discussions about these mark schemes.

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This document consists of **11** printed pages.

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Generic Marking Principles

These general marking principles must be applied by all examiners when marking candidate answers. They should be applied alongside the specific content of the mark scheme or generic level descriptors for a question. Each question paper and mark scheme will also comply with these marking principles.

GENERIC MARKING PRINCIPLE 1:

Marks must be awarded in line with:

- the specific content of the mark scheme or the generic level descriptors for the question
- the specific skills defined in the mark scheme or in the generic level descriptors for the question
- the standard of response required by a candidate as exemplified by the standardisation scripts.

GENERIC MARKING PRINCIPLE 2:

Marks awarded are always **whole marks** (not half marks, or other fractions).

GENERIC MARKING PRINCIPLE 3:

Marks must be awarded **positively**:

- marks are awarded for correct/valid answers, as defined in the mark scheme. However, credit is given for valid answers which go beyond the scope of the syllabus and mark scheme, referring to your Team Leader as appropriate
- marks are awarded when candidates clearly demonstrate what they know and can do
- marks are not deducted for errors
- marks are not deducted for omissions
- answers should only be judged on the quality of spelling, punctuation and grammar when these features are specifically assessed by the question as indicated by the mark scheme. The meaning, however, should be unambiguous.

GENERIC MARKING PRINCIPLE 4:

Rules must be applied consistently, e.g. in situations where candidates have not followed instructions or in the application of generic level descriptors.

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GENERIC MARKING PRINCIPLE 5: Marks should be awarded using the full range of marks defined in the mark scheme for the question (however; the use of the full mark range may be limited according to the quality of the candidate responses seen).
GENERIC MARKING PRINCIPLE 6: Marks awarded are based solely on the requirements as defined in the mark scheme. Marks should not be awarded with grade thresholds or grade descriptors in mind.

Science-Specific Marking Principles

1	Examiners should consider the context and scientific use of any keywords when awarding marks. Although keywords may be present, marks should not be awarded if the keywords are used incorrectly.
2	The examiner should not choose between contradictory statements given in the same question part, and credit should not be awarded for any correct statement that is contradicted within the same question part. Wrong science that is irrelevant to the question should be ignored.
3	Although spellings do not have to be correct, spellings of syllabus terms must allow for clear and unambiguous separation from other syllabus terms with which they may be confused (e.g. ethane / ethene, glucagon / glycogen, refraction / reflection).
4	The error carried forward (ecf) principle should be applied, where appropriate. If an incorrect answer is subsequently used in a scientifically correct way, the candidate should be awarded these subsequent marking points. Further guidance will be included in the mark scheme where necessary and any exceptions to this general principle will be noted.
5	‘List rule’ guidance For questions that require ***n*** responses (e.g. State **two** reasons …): • The response should be read as continuous prose, even when numbered answer spaces are provided. • Any response marked *ignore* in the mark scheme should not count towards ***n***. • Incorrect responses should not be awarded credit but will still count towards ***n***. • Read the entire response to check for any responses that contradict those that would otherwise be credited. Credit should **not** be awarded for any responses that are contradicted within the rest of the response. Where two responses contradict one another, this should be treated as a single incorrect response. • Non-contradictory responses after the first ***n*** responses may be ignored even if they include incorrect science.

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6	Calculation specific guidance Correct answers to calculations should be given full credit even if there is no working or incorrect working, **unless** the question states 'show your working'. For questions in which the number of significant figures required is not stated, credit should be awarded for correct answers when rounded by the examiner to the number of significant figures given in the mark scheme. This may not apply to measured values. For answers given in standard form (e.g. $a \times 10^n$) in which the convention of restricting the value of the coefficient (a) to a value between 1 and 10 is not followed, credit may still be awarded if the answer can be converted to the answer given in the mark scheme. Unless a separate mark is given for a unit, a missing or incorrect unit will normally mean that the final calculation mark is not awarded. Exceptions to this general principle will be noted in the mark scheme.
7	Guidance for chemical equations Multiples / fractions of coefficients used in chemical equations are acceptable unless stated otherwise in the mark scheme. State symbols given in an equation should be ignored unless asked for in the question or stated otherwise in the mark scheme.

Mark scheme abbreviations

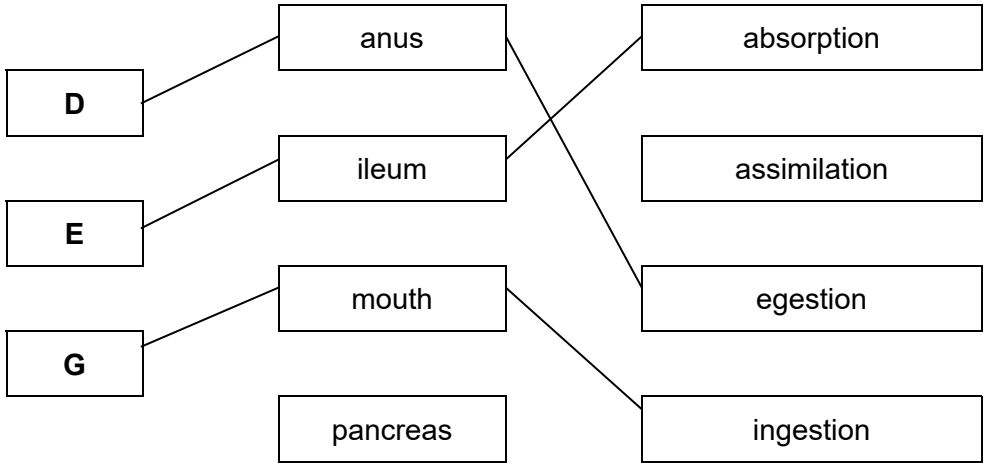
- **;** separates marking points
- **/** alternative responses for the same marking point
- **R** reject the response
- **A** accept the response
- **I** ignore the response
- **ecf** error carried forward
- AVP any valid point
- **ora** or reverse argument
- AW alternative wording
- underline actual word given must be used by candidate (grammatical variants excepted)
- ( ) the word / phrase in brackets is not required but sets the context

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Question	Answer	Marks	Guidance
1(a)(i)	arrow drawn going **into** the root **;** arrow drawn coming **out** from (either surface) of the leaf **;**	**2**	**R** if no arrowheads shown
1(a)(ii)	xylem **;**	**1**	
1(b)(i)	evaporation **;** (spongy) mesophyll **;** stoma(ta) **;**	**3**	
1(b)(ii)	*any two from:* *idea of* rate of transpiration increasing in both, (then levels out with increasing temperature) **;** (rate of) transpiration is greater in the lower surface (than in the upper surface) AW **;** AVP **;**	**2**	e.g., there are more stomata on the lower surface
1(c)	(as the humidity increases, the rate of transpiration) decreases **;**	**1**	
1(d)	**X** - condensation **;** **Y** - precipitation **;**	**2**	

Question	Answer	Marks	Guidance
2(a)	maintenance of a constant **;** internal environment **;**	**2**	

Question	Answer	Marks	Guidance
2(b)	The brain coordinates body functions. contains receptors that detect the temperature of the blood. produces insulin. receives impulses from motor neurones. receives impulses from the optic nerve. and spinal cord are part of the peripheral nervous system. ;;;	**3**	one mark for each correct line **R** each additional line
2(c)	**J** – sweat gland **;** **K** – receptor **;** **L** – fatty tissue **;**	**3**	

Question	Answer	Marks	Guidance
2(d)	*any three from:* fatty (tissue), insulates / reduces heat loss **;** hair (erector) muscles contract to raise hair (away from the surface); hair, insulates / traps a layer of air / reduces heat loss **;** muscle contraction / shivering **;** (shivering) generates heat from respiration **;** brain detects change in blood temperature AW **;** AVP **;**	**3**	
3(a)(i)	**;;;;;;**	**6**	one mark for each correct line **R** each additional line
3(a)(ii)	**F ;** breaks down amino acids / formation of urea / AVP **;**	**2**	

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th><th>Guidance</th></tr>
<tr><td>3(b)</td><td>any four from:
liver damage (described) ;
depressant ;
increase / slows, reaction times ;
(loss of) self-control ;
addiction ;
withdrawal symptoms ;
(named) negative social implication ;
AVP ;;;</td><td>4</td><td></td></tr>
<tr><td>3(c)</td><td>
<table>
<tr><td>large molecule</td><td>enzyme</td><td>small molecule</td></tr>
<tr><td>protein</td><td>(named) protease ;</td><td>amino acids</td></tr>
<tr><td>starch ;</td><td>amylase</td><td>glucose</td></tr>
<tr><td>fats and oils</td><td>lipase ;</td><td>(fatty acids and) glycerol ;</td></tr>
</table>
</td><td>4</td><td></td></tr>
</table>

Question	Answer	Marks	Guidance
4(a)(i)	banana (plant) / pineapple (plant) ;	**1**	
4(a)(ii)	howler monkey / golden lion tamarin / sloth ;	**1**	
4(a)(iii)	3 ;	**1**	
4(a)(iv)	banana /pineapple **(**⟶ howler monkey) ; (howler monkey) ⟶ ocelot ⟶ jaguar ;	**2**	
4(a)(v)	(anacondas decrease because) there is less food ; (sloths increase because) there is more food ;	**2**	
4(a)(vi)	(the) Sun ;	**1**	

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Question	Answer	Marks	Guidance
4(b)(i)	2.6 (cm) **;**	**1**	
4(b)(ii)	primary consumer bar is the widest **and** all four feeding levels are in the correct order **;** bars are of equal height **;** width of the bars is drawn to match the values in the third column of Table 4.1 **;** each bar is labelled with the feeding level **;**	**4**	ecf from **4(b)(i)**
4(c)	*any three from:* extinction **;** loss of soil / erosion **;** flooding / changing patterns of rainfall; increase of carbon dioxide in the atmosphere / global warming **;** loss of (named) useful products; AVP **;;**	**3**	

Question	Answer	Marks	Guidance
5(a)(i)	**AB** ; **B** ; **O** ; 30 ;	**4**	
5(a)(ii)	discontinuous ; limited number of phenotypes / no intermediates ;	**2**	
5(b)	decreases ;	**1**	

Question	Answer	Marks	Guidance
6(a)	(loss of) watery faeces / AW ; oral rehydration therapy ;	**2**	
6(b)	*any four from:* use hygienic food preparation methods ;; examples of hygienic food storage ;; (named example of) appropriate waste disposal ; good personal hygiene ; monitor or identify infected individuals / isolate infected individuals ; AVP ;	**4**	e.g. store food at correct temperature / cook food thoroughly / ref. to cleaning utensils or surfaces / avoiding cross contamination / pest-proof food storage

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Question	Answer	Marks	Guidance
7(a)(i)	shoot drawn going up towards light ; root drawn going down away from light ;	**2**	
7(a)(ii)	phototropism ;	**1**	
7(a)(iii)	mitosis ;	**1**	
7(b)	suitable temperature ; oxygen ; water ;	**3**	**R** each additional circle
7(c)	growth ; carbon ; hydrogen ; magnesium ; chlorophyll ; photosynthesis ;	**6**	carbon and hydrogen in either order

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