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CAMBRIDGE
International Education

Cambridge IGCSE™

BIOLOGY **0610/32**

Paper 3 Theory (Core) **February/March 2025**

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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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 descriptions 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	<u>'List rule' guidance</u> 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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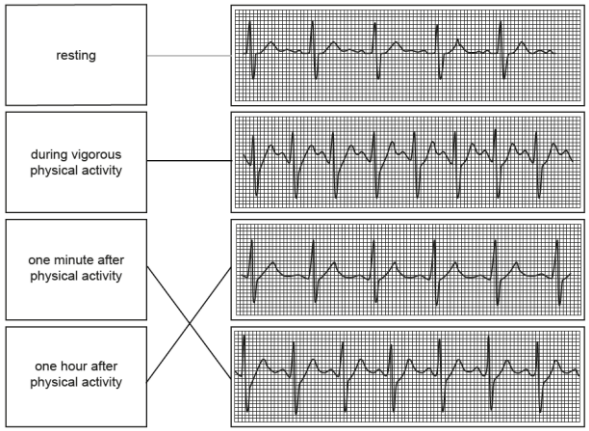
Question	Answer	Marks	Guidance
1(a)	molecules ; amino acids ; carbon **and** hydrogen **and** oxygen ; nitrogen ;	**4**	**A** elements in any order for MP3 and 4
1(b)	(substance that) increase the rate of a (chemical) reaction ; not changed by the reaction / not (permanently) used up ;	**2**	
1(c)	*any three from:* 1 substrate and enzyme combine / join together / AW ; 2 (at the) active site / where shapes fit together / where shapes are complementary / where shape of the sites mirror each other / AW ; 3 bond/s in substrate broken / AW ; 4 products, released / leave enzyme ; 5 enzyme free to act on more substrate / AW ;	**3**	
1(d)(i)	50 ± 1 ;	**1**	
1(d)(ii)	66 (°C) ; zero activity / no enzyme activity ;	**2**	
1(d)(iii)	7.2 ;;	**2**	MP1: 2.8 and 10 seen MP2: difference calculated between values in MP1 (ecf)
1(d)(iv)	same shaped curve (gradual rising to a peak with sharp decline) ; optimum around 37 °C ±2 **;**	**2**	

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Question	Answer	Marks	Guidance
2(a)(i)	G ; *any two from:* (named) amylase ; (named) protease ; (named) lipase ;	**3**	
2(a)(ii)	*any one from:* B **and** salivary glands ; D **and** liver ; E **and** gall bladder ;	**1**	
2(a)(iii)	*any two from:* (chemical) digestion / description of ; absorption of, nutrients / digested substances / named nutrient ;	**2**	
2(b)(i)	*any three from:* 1 *state* (concentration) increases then decreases ; 2 (concentration), increases rapidly / decreases gradually / AW ; 3 reaches a peak / greatest concentration at, 2 hours / 1.8 au ; 4 antibiotic remains in the blood after 10 hours ; 5 additional data quote(not given in MP3 or MP4) using information / units from both axes ;	**3**	
2(b)(ii)	ingestion circled ;	**1**	
2(b)(iii)	plasma ;	**1**	
2(b)(iv)	bacteria ;	**1**	

Question	Answer	Marks	Guidance
3(a)(i)	labelled line with X to <u>wall</u> of the left ventricle ;	**1**	

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Question	Answer	Marks	Guidance
3(a)(ii)	(from A) into (right) atrium ; into (right) ventricle ; ref to movement through, valve / named valve ;	**3**	
3(a)(iii)	pulmonary vein ;	**1**	
3(b)(i)	 ;;	**2**	3 correct = 2 marks 1–2 correct = 1 mark
3(b)(ii)	*any two from:* (counting the) pulse rate ; listening to the sound (of the valves) ; AVP ;	**2**	e.g. blood pressure monitor

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Question	Answer	Marks	Guidance
3(c)(i)	alcohol is produced: carbon dioxide is produced: glucose is required: ✓ ; lactic acid is produced: ✓ ; oxygen is required: releases less energy per substrate molecule than aerobic respiration: ✓ ;	**3**	1 mark for each correct tick **R** each additional tick
3(c)(ii)	*rate:* increases **and** *depth:* increases ;	**1**	

Question	Answer	Marks	Guidance
4(a)	Gametes are produced. : Involves implantation. : Only one parent is involved. : ✓ ; Pollination occurs before the stage shown in Fig. 4.1. : The offspring are genetically identical to each other. : ✓ ; The reproduction is asexual. : ✓ ;	**3**	1 mark for each correct tick **R** each additional tick

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Question	Answer	Marks	Guidance
4(b)	**L** filament ; **M** ovule ; **N** sepal ;	**3**	
4(c)(i)	*prediction:* insect pollination ; *explanation:* *any two from:* 1 large petals ; 2 anthers / stamens, are not visible ; 3 stigma is not visible / stigma enclosed by petals ;	**1+2**	mark prediction and explanation independently
4(c)(ii)	transfer of pollen ; from an anther to a stigma ;	**2**	
4(d)(i)	**Q** / **R** ;	**1**	
4(d)(ii)	0.08–0.10 ; mm ;	**2**	
4(d)(iii)	*any two from:* spikes / hooks / rough ; sticky ; heavy ; large (diameter) ;	**2**	

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Question	Answer	Marks	Guidance
5(a)(i)	*any one from:* 3 pairs of legs ; body divided into, three parts / head, thorax and abdomen ; one pair of antennae ;	**1**	
5(a)(ii)	jointed legs / jointed appendages / segmented body ;	**1**	
5(b)(i)	*any three from:* *features* body is wide and flat / (some) leg joints are wide and flat ; looks like a leaf ; *importance* difficult for predators to see it ; less likely to be eaten by a predator / more likely to, survive / reproduce ;	**3**	
5(b)(ii)	variation ; alleles / genes ; natural ;	**3**	
5(c)	*any three from:* monitoring / counting species ; *idea of* protecting habitats ; education ; captive breeding ; seed banks ; reduce hunting / predation / poaching ; AVP ;	**3**	e.g. nature reserves, wildlife parks **A** zoo, sanctuary **A** legislation e.g. remove invasive species

Question	Answer	Marks	Guidance
6(a)(i)	B ; steepest (part of) curve ;	**2**	marks are independent

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Question	Answer	Marks	Guidance
6(a)(ii)	6400 (kg) ;;	**2**	MP1: 6.4 (tonnes per unit area) (seen) MP2: value from graph × 1000 ecf from previous step
6(a)(iii)	D in first gap and F at the end ; E in second gap and C after B ;	**2**	
6(a)(iv)	*any three from:* use (named) fertilisers ; use (named), insecticides / pesticides ; use (named) herbicides ; use GM seeds ; use, irrigation / drainage ; deter animals that eat barley ; AVP ;;	**3**	e.g. crop rotation / plant seeds in drills / cover seeds with soil / plant at optimal spacing (for barley)/ plant as a monoculture
6(b)(i)	*idea of* only one type of plant grown / single crop grown / AW ;	**1**	
6(b)(ii)	*max 1 from advantages:* 1 allows large area of land to be used efficiently ; 2 increases (overall) yield ; 3 allows machinery to be used ; 4 allows farmers to specialise ; 5 AVP ; *max 1 from disadvantages:* 1 increases insect pests ; 2 increases risk of disease ; 3 risks total crop failure ; 4 reduces biodiversity / AW ; 5 depletes soil nutrients ; 6 AVP ;	**2**	e.g. cheaper / costs less e.g. extinction / loss of habitats / reduces food for pollinators e.g. ref to pollution

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