Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

BIOLOGY **0610/33**

Paper 3 Theory (Core) **October/November 2019**

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.

Cambridge International is publishing the mark schemes for the October/November 2019 series for most Cambridge IGCSE™, Cambridge International A and AS Level components and some Cambridge O Level components.

This syllabus is regulated for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

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:

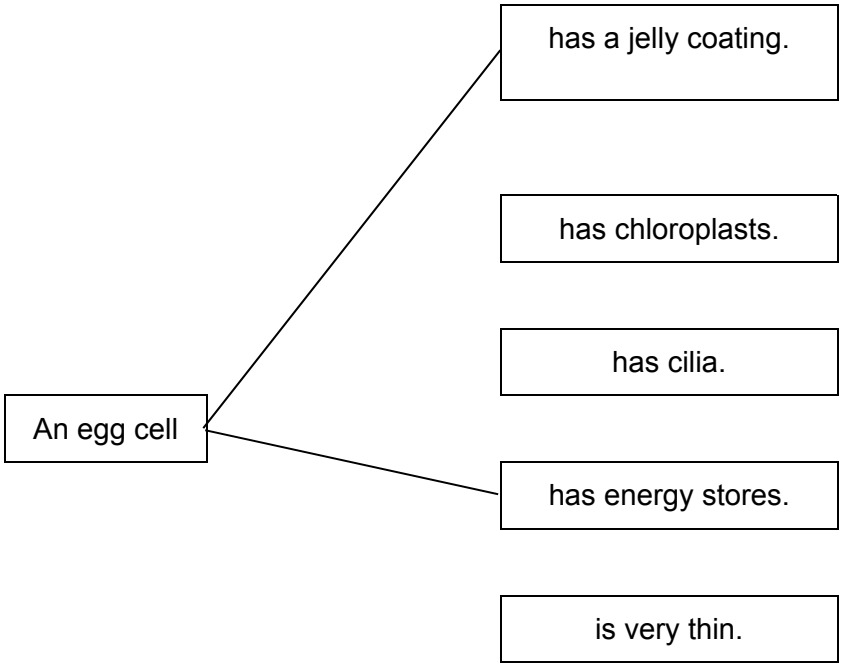
Marks must be awarded **positively**:

- 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.

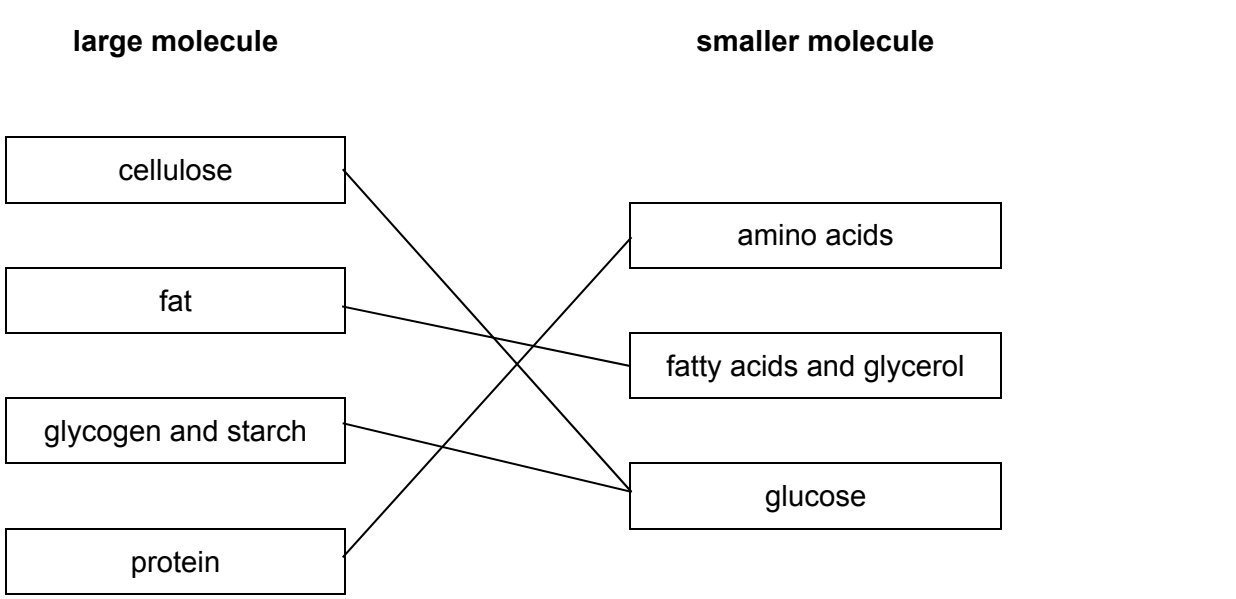
GENERIC MARKING PRINCIPLE 5: Marks should be awarded using the full range of marks defined in the mark scheme for the question (however; the use of the full mark range may be limited according to the quality of the candidate responses seen).
GENERIC MARKING PRINCIPLE 6: Marks awarded are based solely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

Question	Answer	Marks	Guidance
1(a)(i)		**2**	
1(a)(ii)	*drawing* tail drawn onto mid-piece **;** *main features max 2 from:* tail / flagellum **;** enzymes**;** nucleus / genetic material / chromosomes **;** cytoplasm **;** cell membrane **;** AVP **;**	**3**	**A** acrosome

Question	Answer	Marks	Guidance
1(b)(i)	(largest) nucleus (in the middle) chromosome (smallest) gene **;**	**1**	
1(b)(ii)	DNA **;**	**1**	
1(c)	xylem (vessels) **;** ciliated (cell) **;** palisade (mesophyll cell) **;** red blood (cell) **;**	**4**	

Question	Answer	Marks	Guidance
2(a)	sensory (neurone) **;**	**1**	
2(b)(i)	synapse **;**	**1**	
2(b)(ii)	electrical signal **;**	**1**	

Question	Answer		Marks	Guidance
2(c)	includes the brain and spinal cord	✓ ;	**3**	
	is made up of the brain, heart and spinal cord			
	consists of the central nervous system only			
	consists of the central and peripheral nervous system	✓ ;		
	coordinates through the release of hormones			
	coordinates and regulates body functions	✓ ;		
2(d)	carbon, hydrogen, oxygen **;** nitrogen **;**		**2**	

Question	Answer	Marks	Guidance
2(e)	 ;;;;	4	

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th><th>Guidance</th></tr>
<tr><td>3(a)</td><td>microscope ;
membrane ;
nucleus ;
wall ;
vacuole ;
respiration ;</td><td>6</td><td></td></tr>
<tr><td>3(b)(i)</td><td>
<table>
<tr><th>feature</th><th>mitosis</th><th>meiosis</th></tr>
<tr><td>produces gametes</td><td>(✓)</td><td>✓</td></tr>
<tr><td>produces genetically different cells</td><td></td><td>✓</td></tr>
<tr><td>produces genetically identical cells</td><td>✓</td><td></td></tr>
<tr><td>produces new cells during growth and repair to damaged tissues</td><td>✓</td><td></td></tr>
<tr><td>replaces cells</td><td>✓</td><td></td></tr>
<tr><td>used in asexual reproduction</td><td>✓</td><td></td></tr>
</table>
</td><td>4</td><td>6 correct = 4 marks
4 and 5 correct = 3 marks
2 and 3 correct = 2 marks
1 correct = 1 mark</td></tr>
<tr><td>3(b)(ii)</td><td>X and X ;
X and Y ;</td><td>2</td><td></td></tr>
</table>

Question	Answer	Marks	Guidance
4(a)	differences between individuals **;** of the same species **;**	**2**	
4(b)(i)	140 **;**	**1**	
4(b)(ii)	20.0–20.9 (cm) **;**	**1**	
4(c)	*type:* continuous / phenotypic **;** *evidence:* range of phenotypes / AW **;**	**2**	

Question	Answer	Marks	Guidance
5(a)(i)	label line pointing to testis **;** testes / testis **;**	**2**	
5(a)(ii)	oestrogen **;**	**1**	
5(a)(iii)	<table><tr><th>girls only</th><th>boys and girls</th></tr><tr><td>menstruation begins breasts grow pelvis broadens</td><td>growth of under arm hair growth of pubic hair</td></tr></table> **;;;**	**3**	5 correct = 3 marks 4 or 3 correct = 2 marks 2 or 1 correct = 1 mark
5(b)	increased rate of breathing **;** increased, pulse / heart, rate **;** widening of pupils **;** AVP **;** e.g. more glucose in blood / more alert	**2**	

Question	Answer	Marks	Guidance
6(a)(i)	(chemical reactions in cells that) break down of nutrient molecules to release energy ; without using oxygen ;	**2**	
6(a)(ii)	lactic acid ;	**1**	
6(a)(iii)	produces carbon dioxide ; produces alcohol ;	**2**	
6(b)(i)	24 (:1) ;;	**2**	
6(b)(ii)	aerobic releases more energy / anaerobic releases less energy ; run faster / run further / less fatigue / AW ; AVP ;	**2**	
6(c)	140 ;;	**2**	
6(d)	alveoli ; two(-way) ;	**2**	

Question	Answer	Marks	Guidance
7(a)(i)	they will grow towards the light / AW ;	**1**	
7(a)(ii)	phototropism ;	**1**	
7(a)(iii)	plants make their own food ; light provides energy ; for photosynthesis ; ref. to chlorophyll ; in chloroplasts ; to produce, carbohydrates / glucose / sugars ; (energy) needed for growth ; AVP ;	**4**	
7(a)(iv)	(roots) grow away from the light ;	**1**	
7(b)	suitable temperature ; water ; oxygen ;	**3**	
7(c)	(water absorbed by) osmosis ; vacuole fills with, water / fluid / AW ; pressure (of the water) ; pressing / pushing, outwards on the cell wall ;	**2**	

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th><th>Guidance</th></tr>
<tr><td>8(a)</td><td>
<table>
<tr><th>name</th><th>letter from Fig. 8.1</th><th>function</th></tr>
<tr><td>cornea</td><td>F ;</td><td>refracts light</td></tr>
<tr><td>iris</td><td>G</td><td>controls how much light enters the pupil</td></tr>
<tr><td>retina</td><td>A ;</td><td>contains light receptors</td></tr>
<tr><td>lens ;</td><td>D</td><td>focuses light on the retina</td></tr>
<tr><td>optic nerve</td><td>C</td><td>carries impulses to the brain ;</td></tr>
</table>
</td><td>4</td><td></td></tr>
<tr><td>8(b)</td><td>pupil (diameter), gets smaller / constricts ;
restricts / reduces / controls, the amount of light entering the eye / AW ;
reflex (action) / involuntary action / automatic / protective ;</td><td>2</td><td></td></tr>
</table>