
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.

This document consists of **13** printed pages.

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:

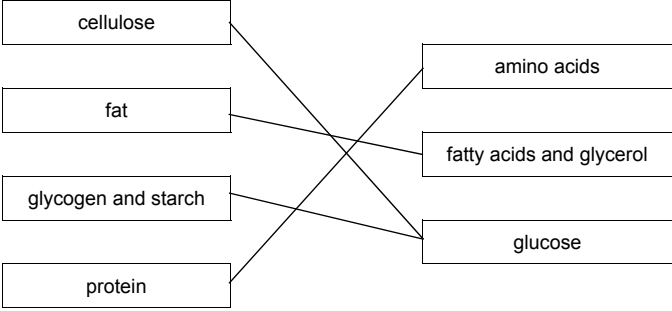
Marks awarded are based solely on the requirements as defined in the mark scheme. Marks should not be awarded with grade thresholds or grade descriptors in mind.

Question	Answer	Marks	Guidance
1(a)(i)	<div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 2px; margin-right: 10px;">An egg cell</div> <div style="display: flex; flex-direction: column; gap: 10px;"> <div style="border: 1px solid black; padding: 2px;">has a jelly coating.</div> <div style="border: 1px solid black; padding: 2px;">has chloroplasts.</div> <div style="border: 1px solid black; padding: 2px;">has cilia.</div> <div style="border: 1px solid black; padding: 2px;">has energy stores.</div> <div style="border: 1px solid black; padding: 2px;">is very thin.</div> </div> </div>	2	
1(a)(ii)	<p><i>drawing</i> tail drawn onto mid-piece ;</p> <p><i>main features max 2 from:</i> tail / flagellum ; enzymes; nucleus / genetic material / chromosomes ; cytoplasm ; cell membrane ; AVP ;</p>	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)	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 80%; padding: 5px;">includes the brain and spinal cord</td> <td style="width: 20%; text-align: center; padding: 5px;"><input checked="" type="checkbox"/> ;</td> </tr> <tr> <td style="padding: 5px;">is made up of the brain, heart and spinal cord</td> <td style="text-align: center; padding: 5px;"><input type="checkbox"/></td> </tr> <tr> <td style="padding: 5px;">consists of the central nervous system only</td> <td style="text-align: center; padding: 5px;"><input type="checkbox"/></td> </tr> <tr> <td style="padding: 5px;">consists of the central and peripheral nervous system</td> <td style="text-align: center; padding: 5px;"><input checked="" type="checkbox"/> ;</td> </tr> <tr> <td style="padding: 5px;">coordinates through the release of hormones</td> <td style="text-align: center; padding: 5px;"><input type="checkbox"/></td> </tr> <tr> <td style="padding: 5px;">coordinates and regulates body functions</td> <td style="text-align: center; padding: 5px;"><input checked="" type="checkbox"/> ;</td> </tr> </table>	includes the brain and spinal cord	<input checked="" type="checkbox"/> ;	is made up of the brain, heart and spinal cord	<input type="checkbox"/>	consists of the central nervous system only	<input type="checkbox"/>	consists of the central and peripheral nervous system	<input checked="" type="checkbox"/> ;	coordinates through the release of hormones	<input type="checkbox"/>	coordinates and regulates body functions	<input checked="" type="checkbox"/> ;	3	
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2(d)	carbon, hydrogen, oxygen ; nitrogen ;	2													

Question	Answer	Marks	Guidance
2(e)	<p data-bbox="236 174 384 203">large molecule</p> <p data-bbox="660 174 825 203">smaller molecule</p>  <pre>graph LR; subgraph Large; C[cellulose]; F[fat]; GS[glycogen and starch]; P[protein]; end; subgraph Smaller; AA[amino acids]; FAG[fatty acids and glycerol]; G[glucose]; end; C --- G; F --- FAG; GS --- G; P --- AA;</pre> <p data-bbox="997 566 1026 584">***</p>	4	

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

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)	<i>type</i> : continuous / phenotypic ; <i>evidence</i> : 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 border="1"> <thead> <tr> <th>girls only</th> <th>boys and girls</th> </tr> </thead> <tbody> <tr> <td>menstruation begins breasts grow pelvis broadens</td> <td>growth of under arm hair growth of pubic hair</td> </tr> </tbody> </table> ;;;	girls only	boys and girls	menstruation begins breasts grow pelvis broadens	growth of under arm hair growth of pubic hair	3	5 correct = 3 marks 4 or 3 correct = 2 marks 2 or 1 correct = 1 mark
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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	

Question	Answer			Marks	Guidance																	
8(a)	<table border="1"> <thead> <tr> <th data-bbox="183 159 336 208">name</th> <th data-bbox="336 159 544 208">letter from Fig. 8.1</th> <th data-bbox="544 159 922 208">function</th> </tr> </thead> <tbody> <tr> <td data-bbox="183 208 336 257">cornea</td> <td data-bbox="336 208 544 257">F ;</td> <td data-bbox="544 208 922 257">refracts light</td> </tr> <tr> <td data-bbox="183 257 336 306">iris</td> <td data-bbox="336 257 544 306">G</td> <td data-bbox="544 257 922 306">controls how much light enters the pupil</td> </tr> <tr> <td data-bbox="183 306 336 356">retina</td> <td data-bbox="336 306 544 356">A ;</td> <td data-bbox="544 306 922 356">contains light receptors</td> </tr> <tr> <td data-bbox="183 356 336 405">lens ;</td> <td data-bbox="336 356 544 405">D</td> <td data-bbox="544 356 922 405">focuses light on the retina</td> </tr> <tr> <td data-bbox="183 405 336 439">optic nerve</td> <td data-bbox="336 405 544 439">C</td> <td data-bbox="544 405 922 439">carries impulses to the brain ;</td> </tr> </tbody> </table>	name	letter from Fig. 8.1	function	cornea	F ;	refracts light	iris	G	controls how much light enters the pupil	retina	A ;	contains light receptors	lens ;	D	focuses light on the retina	optic nerve	C	carries impulses to the brain ;		4	
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8(b)	pupil (diameter), gets smaller / constricts ; restricts / reduces / controls, the amount of light entering the eye / AW ; reflex (action) / involuntary action / automatic / protective ;			2																		