Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

BIOLOGY **0610/32**

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.

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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.

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Question	Answer	Marks	Guidance
1	stomach ; bacteria ; absorbed ; enzymes ; water ;	**5**	

Question	Answer	Marks	Guidance
2	description / meiosis / mitosis can result in growth / ✓ ; / ✓ ; nuclear division / ✓ / ✓ ; occurs in asexual reproduction / ✓ ; produces egg cells / ✓ / (✓) ; replaces damaged cells / ✓ ;	**5**	one mark for each correct row

Question	Answer	Marks	Guidance
3(a)(i)	wide / large, lumen / AW **;** thin wall **;** vessel is flattened / AW **;** valves present **;**	**2**	
3(a)(ii)	vertical arrow pointing upwards (in longitudinal section only) **;**	**1**	
3(b)(i)	feeling / using fingers, on, wrist / neck / AW OR listening to heart beat / using stethoscope / using a (named) monitoring device **;** (counting / measuring) per unit time / stated time **;**	**2**	
3(b)(ii)	76 (beats per min) **;**	**1**	
3(b)(iii)	(pulse rate) increases / AW **;**	**1**	
3(b)(iv)	B1 **;**	**1**	
3(b)(v)	group **A** has higher resting pulse rate (than group **B**) **; ora** group **B** has higher pulse rate after exercise (than group **A**) **; ora** group **B** has higher, increase / change, in pulse rate (after running, than group **A**) **;** group **B** (pulse rate) are more varied / AW (than group **A**, at rest / after running **;** **ora**	**2**	
3(c)	increased (rate of breathing) / AW **;** increased depth (of breathing) **;**	**2**	

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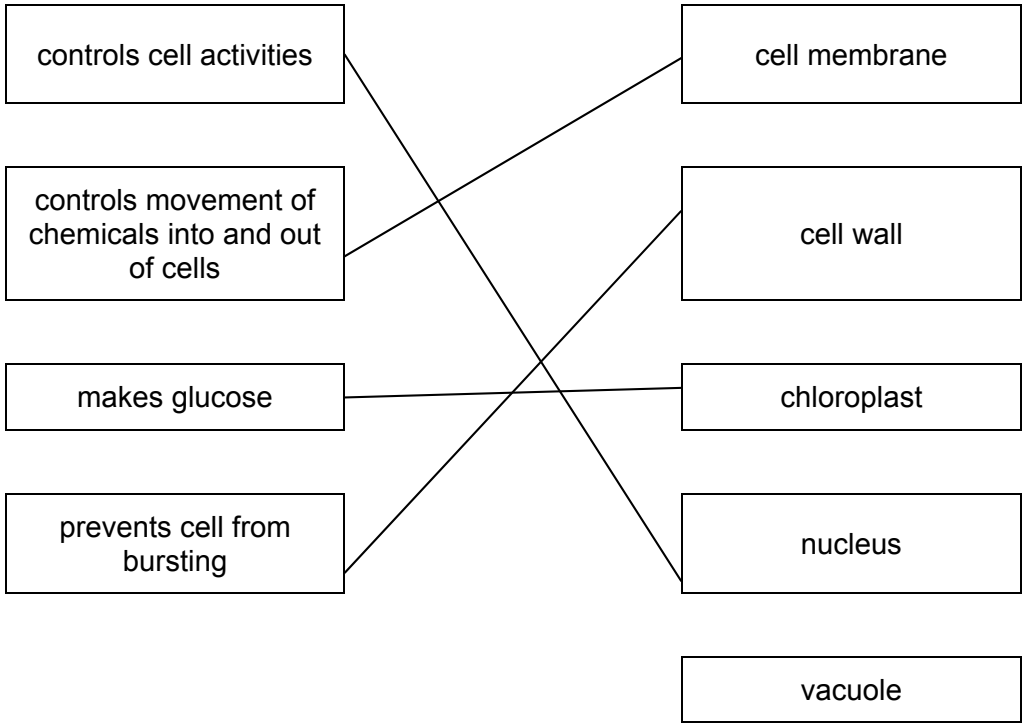
Question	Answer	Marks	Guidance
4	 ;;;;	**4**	

Question	Answer	Marks	Guidance
5(a)(i)	root drawn growing downwards ; shoot drawn growing upwards ;	**2**	
5(a)(ii)	gravitropism ;	**1**	
5(b)(i)	carbon dioxide + water ; ⟶ glucose + oxygen ;	**2**	
5(b)(ii)	magnesium ;	**1**	
5(b)(iii)	palisade (mesophyll) / spongy (mesophyll) / mesophyll / guard ;	**1**	
5(c)(i)	nearer the light / increasing light (intensity), increases (the rate of) photosynthesis ; *idea that* the relationship is not linear ; rate of photosynthesis peaks at 10 cm / AW ;	**2**	
5(c)(ii)	temperature ; carbon dioxide (concentration) ; number of chloroplasts ; surface area / number / size, of leaves / plant ; AVP ; e.g. species of plant	**2**	
5(d)	(for) respiration ; for / release, energy ; converted to starch (for storage) / stored as starch ; made into, cellulose / cell wall ;	**1**	

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Question	Answer	Marks	Guidance
6(a)(i)	larynx ; trachea ; bronchiole ; rib ; diaphragm ;	**5**	must be in this vertical order
6(a)(ii)	circulatory (system) / AW ;	**1**	
6(b)	large (surface) area ; thin (wall) ; good blood supply / lots of capillaries / lots of blood vessels ; good ventilation (with air) / AW ; moist ; AVP ; e.g. small / short, diffusion distance (described)	**3**	
6(c)	tar / carbon monoxide / nicotine ; addictive ; causes cancer ; COPD / emphysema / bronchitis ; more mucus ; paralysis / damage, of cilia / AW ; narrowing of blood vessels / raises blood pressure / blood more likely to clot ; CHD ; less oxygen, in blood / supplied to body OR to cells OR to tissues ; reduces oxygen supply to fetus / low birthweight ; AVP ;	**4**	

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Question	Answer	Marks	Guidance
7(a)	chromosome **;** gene **;** phenotype **;** inheritance **;**	**4**	
7(b)(i)	46 / 23 pairs **;**	**1**	
7(b)(ii)	there are two **X** chromosomes present / no **Y** chromosome / has only **X** chromosomes / is **XX** / is not **XY** **;**	**1**	
7(b)(iii)	47 chromosomes / an extra chromosome / three number 21(chromosomes) **;**	**1**	

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Question	Answer	Marks	Guidance
8(a)	motor / effector, (neurone) ; impulse ; synapse ;	**3**	
8(b)	light ; sound ; temperature ; touch ; chemicals ; AVP ; e.g. gravity / movement / stretch	**3**	
8(c)	(stimulus detected by) receptor ; receptor passes (impulse) to sensory neurone ; sensory neurone passes (impulse) to, relay / intermediate, neurone ; relay neurone passes (impulse) to motor neurone ; motor neurone passes to muscle / gland / effector ; automatic / involuntary / AW ; AVP ;	**4**	

Question	Answer	Marks	Guidance
9(a)(i)	root hair (cell) ;	**1**	
9(a)(ii)	xylem ;	**1**	
9(a)(iii)	leaf / leaves ;	**1**	
9(b)	*any three from:* exhalation **or** breathing out / urine **or** excretion through kidney / sweat / vomit / tears **or** crying / blood loss / menstruation / mucus / semen / faeces / egestion / diarrhoea ;;;	**3**	

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Question	Answer	Marks	Guidance
10(a)(i)	22 (g per hour) **;**	**1**	
10(a)(ii)	06:00 **;**	**1**	
10(a)(iii)	08:00 / 16:00 **;**	**1**	
10(b)	high temperature increases water loss **; ora** high humidity decreases water loss **; ora**	**2**	
10(c)	transpiration **;**	**1**	

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