Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

BIOLOGY **0610/32**

Paper 3 Theory (Core) **March 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 March 2019 series for most Cambridge IGCSE™, Cambridge International A and AS Level components and some Cambridge O Level components.

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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.

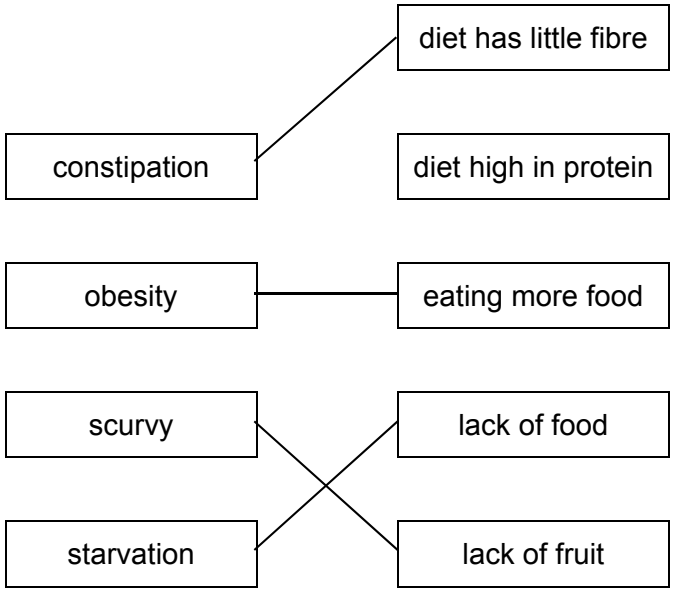
GENERIC MARKING PRINCIPLE 4:

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

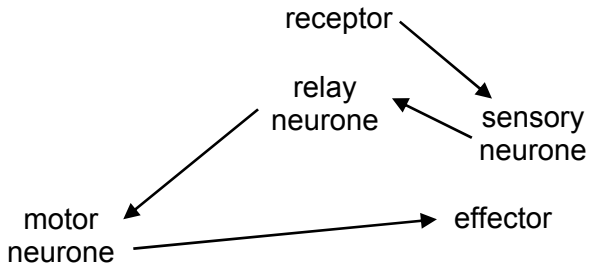
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GENERIC MARKING PRINCIPLE 5: Marks should be awarded using the full range of marks defined in the mark scheme for the question (however**;** the use of the full mark range may be limited according to the quality of the candidate responses seen).
GENERIC 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(a)	protein ; carbohydrate ; minerals (ions) ; water ;	**3**	
1(b)	 ;;;;	**4**	

Question	Answer	Marks	Guidance
2(a)	oxygen ; energy ; muscle ; lactic acid ; carbon dioxide ;	**5**	
2(b)	(bio)fuel ; bread making ; drinking / medicinal, alcohol ; AVP ;;	**2**	
2(c)	the shorter the distance, the greater the energy (used from anaerobic sources) / AW ; **ora** relationship (almost), linear / proportional ; data quoted with units ;	**2**	

Question	Answer	Marks	Guidance
3(a)	pupil draw smaller in diameter than in Fig. 3.1 approximately central and circular ;	**1**	
3(b)(i)	 ;;;	**3**	
3(b)(ii)	synapse ;	**1**	

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th><th>Guidance</th></tr>
<tr><td>3(c)</td><td>
<table>
<tr><th>hormone</th><th>production site</th><th>action</th></tr>
<tr><td>insulin</td><td>pancreas</td><td>decreases blood glucose concentration ;</td></tr>
<tr><td>adrenaline ;</td><td>adrenal gland</td><td>wide pupils, increased heart rate, raised blood glucose concentration</td></tr>
<tr><td>testosterone</td><td>testes ;</td><td>development of (secondary) male characteristics / development of testes / growth of facial hair / growth of penis / growth of pubic hair / voice deepening / increased musculature / AVP ;</td></tr>
</table>
</td><td>4</td><td></td></tr>
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Question	Answer	Marks	Guidance
4(a)	(named) agricultural machinery ; (chemical / artificial) fertilisers ; insecticides ; herbicides ; selective breeding ; genetic engineering ; intensive livestock production ; AVP ;;;	**3**	
4(b)	habitat destruction ; reduction of species ; species extinction ; pollution ; AVP ;;	**2**	

Question	Answer	Marks	Guidance
5(a)	*egg cell:* contains, energy / food, store ; has a jelly coating that changes after fertilisation ; AVP ; *sperm:* has flagellum / tail / can swim ; has enzymes (to break down outer membrane of egg cell) ; AVP ;	**2**	
5(b)	smoking (tobacco) ; drinking alcohol ; taking drugs ; AVP ;	**2**	

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Question	Answer	Marks	Guidance
5(c)(i)	transfers / provides, (named) nutrients ; transfers oxygen ; transfer of (named) waste products / urea ; transfers carbon dioxide ; AVP ;	**2**	
5(c)(ii)	amnion ruptures / release of amniotic fluid ; contraction of uterus (muscles) ; dilation of cervix / AW ; vagina is stretched / AW ; baby pushed out (through vagina) ; umbilical cord, tied / cut / AW ; placenta / afterbirth, expelled / AW ; AVP ;	**3**	

Question	Answer	Marks	Guidance
6(a)(i)	line drawn from **X** (going into the root hair) across the cortex and into the xylem ;	**1**	
6(a)(ii)	osmosis ;	**1**	
6(a)(iii)	xylem ;	**1**	
6(b)(i)	15 (arbitrary units) ;	**1**	

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Question	Answer	Marks	Guidance
6(b)(ii)	*description:* as temperature increases, the rate (of mineral ion uptake) increases **;** peaks at 30 °C **;** rate of uptake decreases, between 30 °C and 40 °C / after 30 °C **;** data quote with units **;** *explanation:* chemical reactions are faster at higher temperatures / AW **;** *idea of* enzymes controlling reactions **;** enzymes inactive at high(er) temperatures **;** AVP **;;**	**4**	
6(c)	nitrate **;** making amino acids **;** OR magnesium **;** to make chlorophyll **;** OR AVP **;;**	**2**	

Question	Answer	Marks	Guidance
7(a)(i)	veins **;** capillaries **;**	**2**	**A** arterioles **;** venules **;**
7(a)(ii)	thick / muscular, wall **;** narrow, hole / lumen / AW **;** no valves / valves only in the (named) arteries in the heart **;** AVP **;**	**2**	

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Question	Answer	Marks	Guidance
7(b)(i)	coronary arteries become, narrowed / blocked ; cause of blockage described ; coronary arteries supply the heart muscle with blood ; (blockage) reduces / stops, blood flow to (heart) muscle ; (muscle tissue / cells die) because, cannot respire / lack of oxygen / lack of (named) nutrient / lack of energy ; AVP ;	**3**	
7(b)(ii)	stress ; smoking (tobacco) ; genetic predisposition / genes ; being older ; gender ; lack of exercise ; AVP ;;;	**3**	

Question	Answer	Marks	Guidance
8	process / in animals / in plants absorption: ✓ ✓ diffusion: ✓ ✓ ; egestion: ✓ ; photosynthesis: ✓ ; respiration: ✓ ✓ ; sexual reproduction: ✓ ✓ ; transpiration: ✓ ;	**6**	

Question	Answer	Marks	Guidance
9(a)	disease causing organism **;**	**1**	
9(b)	type of defence / example mechanical barrier: skin / hairs in the nose / mucus **;** chemical barrier: mucus / stomach acid **;** cell: phagocytosis / antibody production / (named) white blood cell **;**	**3**	

Question	Answer	Marks	Guidance
9(c)(i)	pathogens / AW, removed **or** microbes / AW, live on skin **;** dead skin cells / secretions / sweat, removed **;** acquired substances / AW , on skin removed **;** (so) pathogens / chemicals not transferred to people / food / objects **;** reduces odour **;** AVP **;**	**2**	
9(c)(ii)	(washing powder) contains enzymes **;** proteases / lipases **;** digest / break down, into, fatty acids / glycerol / amino acids **;** *idea of*, soluble in water **;**	**2**	
9(d)	to prevent pathogens contaminating food **;** *idea that* pathogens can be transferred to food by, insects / animals / objects / air **;** *idea of* pathogens in food, can make people ill / cause food poisoning **;**	**2**	

Question	Answer	Marks	Guidance
10(a)	any substance taken into the body **;** modifies or affects chemical reactions in the body **;**	**2**	
10(b)	(lung) cancer **;** COPD **;** AVP **;**	**1**	

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Question	Answer	Marks	Guidance
10(c)	liver ;	1	
10(d)	antibiotics ;	1	

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