Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

BIOLOGY **0610/33**

Paper 3 Theory (Core) **May/June 2018**

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.

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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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Mark schemes will use these abbreviations

- **;** separates marking points
- / alternatives
- **I** **I**
- **R** reject
- **A** **A** (for answers correctly cued by the question, or guidance for examiners)
- AW alternative wording (where responses vary more than usual)
- AVP any valid point
- **ecf** credit a correct statement / calculation that follows a previous wrong response
- **ora** or reverse argument
- ( ) the word / phrase in brackets is not required, but sets the context
- underline actual word given must be used by candidate (grammatical variants excepted)
- max indicates the maximum number of marks that can be given

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Question	Answer	Marks	Guidance
1(a)	bony skeleton / internal skeleton / endoskeleton / bones / vertebral column / backbone / spine / vertebrae / skull **;**	**1**	
1(b)(i)	birds **;** feathers / beaks / bill / hard-shelled eggs **;**	**2**	
1(b)(ii)	reptiles **;** scales (skin) / leathery eggs **;**	**2**	**A** soft-shelled eggs
1(b)(iii)	*evidence for (being a mammal)* it has fur / hair **;** *evidence against* lays / external, eggs **;** young develop outside the body **;** has a beak / bill **;**	**3**	
1(c)	fish **;** amphibians **;**	**2**	

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Question	Answer	Marks	Guidance
2(a)(i)	(reactants) carbon dioxide + water **;** (products) glucose + oxygen **;**	**2**	
2(a)(ii)	chlorophyll **;**	**1**	
2(b)(i)	30(°C) **;**	**1**	
2(b)(ii)	85 and 170 **;**	**1**	
2(b)(iii)	100% **;;**	**2**	(170 – 85) ÷ 85 × 100 = 1 mark ecf **(b)(ii)** for 2 marks
2(c)	rises and falls / rises and peaks / peaks and falls **;** slow increase and fast decrease / slower increase (to peak) **or** steeper / faster, decrease **;** slowest rise between 0 °C and 10 °C / increase more rapid between 10 °C and 25 °C **;** decrease is most rapid after 35 °C / AW **;** (no, bubbles / gas) stops at 40 °C **;**	**3**	
2(d)	light intensity / brightness of light **;** size of plant / number of leaves / size of leaves / surface area of leaves **;** availability / concentration / amount, of CO_2 **;** amount of chlorophyll / number of chloroplasts **;** species / type, of plant **;** water **;**	**1**	**A** amount of light / time of day / different wavelengths of light

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Question	Answer	Marks	Guidance
3(a)(i)	high in (named) carbohydrates **;** high in (named) fats **;** too high in energy / calories / kJ **;** lacks protein **;** lacks (named) vitamins **;** lacks (named) minerals **;** lacks fibre **;** lacking, fruits / vegetables / water **;**	**2**	
3(a)(ii)	eat less (named) carbohydrates / eat less (named) fat / reduce calorie intake / reduce kJ intake / reduce energy consumption **;** consume, fibre / vegetables / fruit / water / protein **;** exercise / physical activity **;** *idea of* using up fat reserves **;** *idea of* input less than output **;**	**2**	AW throughout

Question	Answer	Marks	Guidance
3(b)	vitamin C **;** scurvy **;** teeth **;** vitamin D / calcium **;** constipation **;**	**5**	
3(c)	women will require more, energy / food **;** for growth / development, of fetus **;** more, carbohydrates / proteins / fats / named vitamin / named mineral **;;** role of named nutrient (must be linked to named nutrient) **;;** AVP **;** e.g. ref. to alcohol consumption	**4**	AW throughout **A** growth / development, only once **A** more vitamin = 1 **A** more minerals = 1

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Question	Answer	Marks	Guidance
4(a)(i)	a pathogen / disease causing organism **;** is passed from one host to another **;**	**2**	
4(a)(ii)	*idea of* piercing the skin **;** *idea of* long mouthparts (to reach blood vessel below the skin) **;** hollow mouthparts can suck up blood **;**	**1**	
4(b)(i)	skin / epidermis **;**	**1**	
4(b)(ii)	(antibody) white blood cell ticked **;** (blood clotting) platelets ticked **;** (phagocytosis) white blood cell ticked **;**	**3**	
4(c)	stomach acid / hydrochloric acid **;** mucus **;** tears **;**	**2**	

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Question	Answer	Marks	Guidance
5(a)	**A** combustion **;** **B** feeding **;** **C** fossilisation **;**	**3**	
5(b)(i)	arrow from 'carbon dioxide in the atmosphere' to 'carbon compounds in plants' box and labelled **D ;**	**1**	
5(b)(ii)	arrow from, plants or animals, box to 'carbon dioxide in the atmosphere' and labelled **E ;**	**1**	
5(c)(i)	(named) fossil fuels being burned **;** deforestation**;** industry / factories / power stations / urbanisation / AW **;** (named) transport **;** cattle / farm animals, being raised for food **;**	**2**	
5(c)(ii)	global warming / increased temperatures / climate change / enhanced greenhouse effect **;** flooding **;** increase in sea level / ice caps or glaciers melting **;** desertification **;**	**2**	AW throughout
5(c)(iii)	methane **;** water vapour **;**	**1**	**A** nitrous oxides / ozone / CFC's

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Question	Answer	Marks	Guidance
6(a)(i)	meiosis **;**	**1**	
6(a)(ii)	zygote **;**	**1**	
6(b)(i)	having two identical alleles of a (particular) gene **;**	**1**	
6(b)(ii)	**B ;** all of the offspring have black fur / brown fur not seen in offspring **;**	**2**	**A** black
6(c)	phenotype is, the observable features / appearance, whereas genotype is alleles present / AW **;**	**1**	
6(d)	*gametes* **b** , **b** **B** , **b ;** *offspring genotypes* **bb** **Bb** **Bb** **bb ;** *offspring phenotypes* brown black black brown **;** *ratio* 1:1 **;**	**4**	phenotype must match genotype
6(e)	choose (parents) desired, feature / trait **;** breed / cross / mate **;** choose offspring with the feature **;** breed offspring with feature **;** for, several / many generations **;**	**3**	AW throughout

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Question	Answer	Marks	Guidance
7(a)	insecticides / pesticides ; herbicides ; nuclear waste / radioactive waste ; chemicals / toxic waste / (named) heavy metals ; discarded household rubbish / litter / garbage / trash ; plastics ; fertiliser (from farmland) ; oil / fuel / fossil fuel ;	**4**	**A** acid rain
7(b)	1 screening / removal of large solids / twigs / plastic ; 2 settling out / grit settles to bottom of tank ; 3 microbes / bacteria decompose (digest) organic material ; 4 digestion of materials in liquid by (aerobic) microorganisms ; 5 aeration ; 6 materials in sludge digested by (anaerobic) bacteria ; 7 filtration ; 8 chlorination or sterilisation / use of disinfectants / chemical treatment / bactericides / bacteria or pathogens killed ;	**3**	**A** filtration once only unless qualified
7(c)	a disease causing organism ;	**1**	

Question	Answer	Marks	Guidance
8(a)	(cervix) **G ;** (oviduct) **D ;** (uterus) **F ;** (vagina) **H ;**	**4**	
8(b)	**X** drawn on an ovary **;**	**1**	
8(c)	oviduct **;**	**1**	

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