Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

BIOLOGY **0610/32**

Paper 3 Theory (Core) **May/June 2017**

MARK SCHEME

Maximum Mark: 80

Published

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Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

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Mark schemes will use these abbreviations

- **;** separates marking points
- / alternatives
- **I** ignore
- **R** reject
- **A** accept (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	<table><tr><td>name of tree</td><td>letter</td></tr><tr><td>go to 2</td><td></td></tr><tr><td>go to 4</td><td></td></tr><tr><td>go to 3</td><td></td></tr><tr><td>*Hedera*</td><td>**E**</td></tr><tr><td>*Magnolia*</td><td>**C**</td></tr><tr><td>*Quercus*</td><td>**A**</td></tr><tr><td>*Aesculus*</td><td>**B**</td></tr><tr><td>*Sorbus*</td><td>**D**</td></tr></table>	**4**	1 correct = 1 mark 2 correct = 2 marks 3 or 4 correct = 3 marks 5 correct = 4 marks

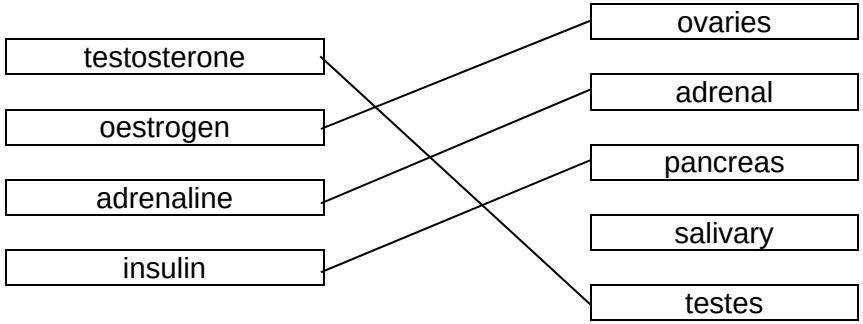
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<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th><th>Guidance</th></tr>
<tr><td>2(a)</td><td>
<table>
<tr><td>process</td><td>letter</td></tr>
<tr><td>ingestion</td><td>A ;</td></tr>
<tr><td>mechanical digestion</td><td>A / D ;</td></tr>
<tr><td>secretion of protease</td><td>D / E ;</td></tr>
<tr><td>absorption of nutrients</td><td>F ;</td></tr>
<tr><td>egestion</td><td>H ;</td></tr>
</table>
</td><td>5</td><td></td></tr>
<tr><td>2(b)(i)</td><td>are protein(s) ;
that function as biological catalysts ;</td><td>2</td><td>I speeds up reaction</td></tr>
<tr><td>2(b)(ii)</td><td>fatty acid(s) ;
glycerol ;</td><td>2</td><td>either order</td></tr>
<tr><td>2(b)(iii)</td><td>carbon, hydrogen and oxygen ;</td><td>1</td><td></td></tr>
<tr><td>2(b)(iv)</td><td>butter ;
olive oil ;</td><td>2</td><td></td></tr>
<tr><td>2(b)(v)</td><td>carbohydrate ;
protein ;
vitamins ;
mineral salts ;
fibre / roughage ;
water ;</td><td>3</td><td>I fat
A named vitamin once
A named mineral once
I examples of foods</td></tr>
</table>

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Question	Answer	Marks	Guidance
2(b)(vi)	for energy / respiration / metabolism **;** insulation / thermal insulation / electrical insulation / myelin / maintains temperature **;** storage of fat / vitamins **;** making cell membranes **;** protection (against mechanical damage) / cushions organs / shock absorber **;** help body absorb vitamins / AW **;** AVP **;** e.g. hormones , buoyancy	**1**	**A** reduce heat loss / keeps body warm **R** insulin

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Question	Answer	Marks	Guidance
3(a)		**4**	1 mark for each correctly linked hormone
3(b)	reduce blood glucose / sugar (concentration) **;** or (promotes conversion of) glucose to glycogen **;**	**1**	**I** regulates / controls
3(c)(i)	ovum / egg (cell) / ova **;**	**1**	
3(c)(ii)	flagellum **;** enzymes / acrosome **;** small size / streamlined **;** mitochondria (in flagellum) **;** only one set of chromosomes / haploid **;**	**2**	

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Question	Answer	Marks	Guidance
3(c)(iii)	meiosis **;**	**1**	
3(d)(i)	increased breathing rate **;** dilates airways in the lungs**;** increased, heart / pulse rate **;** pupil dilation **;** increased blood pressure**;** increased / divert, blood to muscles**;** speeds up reaction time**;** AVP **;**	**2**	**A** increased depth / volume of breathing **A** increased blood glucose concentration / increased metabolic rate **A** increased mental awareness
3(d)(ii)	*the following three boxes ticked* bungee jumping **;** sitting an exam **;** hearing a sudden noise **;**	**3**	

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Question	Answer	Marks	Guidance
4(a)	chemical **;** cells **;** nutrient **;** oxygen **;**	**4**	
4(b)(i)	80 (kJ) **;;**	**2**	1 mark for correct working if answer wrong 1600 x 0.05 or equivalent calculation
4(b)(ii)	carbon dioxide **;** water **;**	**2**	either order
4(b)(iii)	muscle contraction / muscle doing work / (muscle) movement **;** metabolism / enzyme reactions / chemical reactions / digestion**;** protein synthesis **;** cell division / cell repair**;** active transport **;** growth **;** passage of nerve impulses **;** maintenance of a constant body temperature **;** excretion**;**	**3**	**I** exercise **A** reproduction **A** shivering / keep warm / homeostasis
4(c)	(muscle produces) lactic acid **; ora** **or** (muscle) does not produce carbon dioxide / ethanol / alcohol **; ora**	**1**	**A ora** only if yeast stated
4(d)	brewing / making alcoholic drinks / making beer / bread-making / biofuels / making ethanol / making carbon dioxide **;**	**1**	**A** fermentation

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<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th><th>Guidance</th></tr>
<tr><td>5(a)</td><td>(pulmonary) artery correctly labelled ;
(pulmonary) vein correctly labelled ;</td><td>2</td><td></td></tr>
<tr><td>5(b)</td><td>(presence of) valves ;
thin(ner) walls ;
wide(r) lumen ;
less, muscular / elastic, tissues / fibres ;</td><td>2</td><td></td></tr>
<tr><td>5(c)</td><td><table><tr><th>component of blood</th><th>function</th></tr><tr><td>red blood cells</td><td>carries / transport oxygen ;</td></tr><tr><td>white blood cells</td><td>phagocytosis / antibody production / defence / immunity ;</td></tr><tr><td>platelets</td><td>clotting ;</td></tr><tr><td>plasma</td><td>transport of, blood cells / ions / (soluble) nutrients (named) / hormones / carbon dioxide / heat / urea / water / named molecule / enzymes ;</td></tr></table></td><td>4</td><td></td></tr>
</table>

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<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th><th>Guidance</th></tr>
<tr><td>6(a)(i)</td><td>arrow pointing upwards for shoot and arrow pointing downwards for root ;</td><td>1</td><td></td></tr>
<tr><td>6(a)(ii)</td><td>gravitropism ;</td><td>1</td><td></td></tr>
<tr><td>6(b)</td><td>B – lack of / no, moisture / water ;
C – lack of / no, oxygen ;
D – (too) cold / lack of warmth / inappropriate temperature ;</td><td>3</td><td></td></tr>
<tr><td>6(c)(i)</td><td><table><tr><th>mineral ion</th><th>function in plants</th></tr><tr><td>nitrate</td><td>making, amino acids / proteins ;</td></tr><tr><td>magnesium</td><td>for chlorophyll ;</td></tr></table></td><td>2</td><td></td></tr>
<tr><td>6(c)(ii)</td><td>root hair cell ;</td><td>1</td><td></td></tr>
</table>

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Question	Answer	Marks	Guidance
7(a)	small ears ; reduce heat loss ; **or** fur / coat ; reduce heat loss / insulation / keep body temperature constant; **or** white, hair/fur ; for camouflage ; **or** large body / small surface area to volume ratio ; reduce heat loss ; **or** large feet ; spread weight on snow / ice ; **or** dark / black nose lips ; heat absorption AW ;	**2**	explanation must relate to the given feature features must be visible in Fig. 7.1
7(b)	1 variation within, populations / organisms ; 2 more offspring produced than will survive ; 3 competition (for resources) ; 4 best adapted survive ; 5 best adapted reproduce ; 6 passing on their, alleles (to the next generation) ;	**4**	

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Question	Answer	Marks	Guidance
7(c)(i)	*reasons for becoming endangered* climate change/ global warming **;** habitat destruction / ice melting **;** hunting / poaching **;** pollution **;** reduced (access to) food supply **;** AVP **;** e.g. disease *conservation methods* protecting habitats / national park **;** ref to education **;** captive breeding programmes **;** zoos / wildlife park / sanctuary / protecting species **;**	**4**	max 3 from either section

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<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th><th>Guidance</th></tr>
<tr><td>8(a)(i)</td><td><u>male 20–34</u> ;</td><td>1</td><td></td></tr>
<tr><td>8(a)(ii)</td><td>16 (%) ;</td><td>1</td><td></td></tr>
<tr><td>8(b)</td><td><table><tr><th>component in cigarette smoke</th><th>effect on the body</th></tr><tr><td>carbon monoxide</td><td>reduces oxygen carrying capacity of blood / AW ;</td></tr><tr><td>tar</td><td>(named) cancer / irritates airways / damages cilia / COPD / emphysema / (stimulates) increased mucus production ;</td></tr><tr><td>nicotine</td><td>addictive / stimulant / increases blood pressure ;</td></tr></table></td><td>3</td><td></td></tr>
<tr><td>8(c)</td><td>stress / too much salt in diet / too much fat in diet / obesity / genetic predisposition / age / gender / diabetes / cholesterol / lack of exercise / high blood pressure ;;</td><td>2</td><td></td></tr>
</table>

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