

CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge International General Certificate of Secondary Education

MARK SCHEME for the October/November 2015 series

0610 BIOLOGY

0610/21

Paper 2 (Core), maximum raw mark 80

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Abbreviations used in the Mark Scheme

- ; separates marking points
- / separates alternatives within a marking point
- **R** reject
- **ignore** mark as if this material was not present
- **A** accept (a less than ideal answer which should be marked correct)
- **AW** alternative wording (accept other ways of expressing the same idea)
- underline words underlined (or grammatical variants of them) must be present
- **max** indicates the maximum number of marks that can be awarded
- **mark independently** the second mark may be given even if the first mark is wrong
- **ecf** credit a correct statement that follows a previous wrong response
- () the word / phrase in brackets is not required, but sets the context
- **ora** or reverse argument
- **AVP** any valid point

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Question	Answer	Marks	Additional Guidance
1	E <i>E. robustus</i> ; B <i>A. marsupialis</i> ; A <i>D. bicornis</i> ; C <i>M. rufus</i> ; D <i>H. sapiens</i> ;	max [4]	4 or 5 correct = 4 marks 3 correct = 3 marks 2 correct = 2 marks 1 correct = 1 mark
		[Total: 4]	
2 (a)	constant / maintenance / AW ; <u>internal</u> environment / AW ;	[2]	
(b) (i)	F: hair ; G: (temperature) receptors / AW ; H: <u>sweat gland</u> ;	[3]	
(ii)	3 ;	[1]	
(c) (i)	arterioles dilate ; more blood flows, to the (skin) surface / through the (surface)capillaries ; (more) heat is taken to the surface / blood carries heat ; heat (energy) is lost (from the skin) ;	max [3]	A more, conduction / convection / radiation

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(ii)	<ol style="list-style-type: none"> 1. sweat / water on skin surface ; 2. water is evaporated ; 3. (body) heat / energy used (in evaporation) ; 4. heat, from body / carried by blood ; 5. blood temperature decreases ; 6. correct reference to heat loss by conduction / convection / radiation ; 	max [3]	<p>idea of “more” must be expressed at some point</p> <p>A water vapour is lost</p>
(iii)	<p>shivering or description ;</p> <p>vasoconstriction / AW ;</p> <p>hairs stand on end ;</p> <p>increased rate of respiration ;</p>	max [2]	
(d)	<p>brain ;</p> <p>hypothalamus ;</p>	max [1]	ignore CNS
		[Total: 15]	

3		[5]	1 mark for each correct linkage
		[Total: 5]	

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4 (a)	<p><i>growth:</i></p> <p>1. (seedling) increase in size / (dry) mass / AW ;</p> <p>2. permanent (increase in size) ;</p> <p>3. larger / more cells ;</p> <p><i>development:</i></p> <p>4. cells become specialised ;</p> <p>5. increase in complexity ;</p> <p>6. ref. to formation of new (named) structures ;</p>	max [4]	A leaves / shoot / roots / stem
	<p>(b)</p> <p>oxygen / O₂ ;</p> <p>water / H₂O ;</p> <p>(suitable) temperature / warmth ;</p>		
		[Total: 7]	
5 (a)		[6]	
	E ; testis ;		
	F ; penis ;		
	D ; urethra ;		

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(b) (i)	centre of X anywhere on the sperm duct ;	[1]	
(ii)	to prevent sperm passing down the sperm duct ;	[1]	
		[Total: 8]	
6 (a)	renal artery ; renal vein ;	[2]	either order
(b)	(excess) water ; (named) ions / salts ; hormones ; vitamins ;	max [1]	ignore named elements ignore glucose / protein / fats
(c) (i)	liver ;	[1]	
(ii)	too many / excess, amino acids / protein ; idea of: inability to store / removal of (excess, amino acids or protein) / AW ; need to be broken down ;	max [2]	A deaminated A ref to remaining carbohydrates as an energy source
(iii)	in plasma / blood ;	max [1]	
		[Total: 7]	
7 (a) (i)	(carbon compounds in) plants ;	[1]	
(ii)	feeding / eating / nutrition / digestion / AW ;	[1]	ignore herbivore R carnivore
(iii)	arrow drawn in opposite direction to E / from CO ₂ in air to box H ;	[1]	A arrow if unlabelled as long as only 1 arrow drawn
(iv)	death ;	[1]	ignore decay / decomposition / rotting

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(b) (i)	A ; E ;	[2]	either order A F
(ii)	glucose + oxygen ; \longrightarrow carbon dioxide + water ;	[2]	R if energy given on LHS ignore if energy given on RHS If chemical equation is given it must be correct and balanced = 2 mark/ 1 mark per “side” ignore mixed chemical and word equation
(iii)	releases energy ; example of use of energy(in cells or organisms) ;	[2]	e.g. growth / synthesis / active transport / movement / reproduction /
		[Total: 10]	
8 (a)	1. (food)consists of, large / complex / insoluble, molecules ; 2. (food) needs to be broken down ; 3. by, mechanical / chemical, processes ; 4. to, small / simple / soluble, molecules ; 5. (small / simple / soluble, molecules) for absorption/ ora ;	max [3]	ignore convert

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(b)	<p>J liver ;</p> <p>K stomach ;</p> <p>L large intestine / colon ;</p> <p>M small intestine / ileum ;</p>	[4]	
(c) (i)	<u>950</u> (per cm ²) ;	[1]	
(ii)	<p>Q has, most / more, villi (per cm²) ;</p> <p>has large(st) surface (area) ;</p> <p>villi is where absorption takes place / AW ;</p> <p>by diffusion ;</p> <p>data processing mark ;</p>	max [3]	A active transport
		[Total: 11]	
9 (a)	<p>evaporation of water ;</p> <p>(from) mesophyll (cells / tissue) ;</p> <p>water vapour loss ;</p> <p>by diffusion ;</p> <p>through stomata ;</p>	max [3]	must be in correct context

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(b)	<p>add water ; to restore turgor to cells / AW ;</p> <p>put in the dark / put in shade / AW ; stomata close so, less water loss / less transpiration ;</p> <p>lower temperature ; reduces KE of water molecules ;</p> <p>protect from draughts / wind / method of ; to reduce diffusion gradient ;</p> <p>increase humidity / method of ; to reduce diffusion gradient ;</p>	max [4]	<p>reason must match the change mark change and explanation together</p> <p>ignore ref to photosynthesis</p>
		[Total: 7]	
10 (a)	<p>A: log / exponential (phase) ;</p> <p>B: stationary (phase) ;</p>	[2]	ignore descriptions
(b) (i)	<p><i>difference:</i> no stationary phase or exponential / log, phase has continued / AW ;</p> <p><i>explanation:</i> development of farming / improved food supplies / AW ;</p> <p>ref. to sanitation / hygiene / AW ;</p> <p>ref. to medical treatments / care ;</p> <p>use of technology / AW ;</p> <p>AVP ;</p>	max [3]	

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(ii)	<p><i>lack of (named) resource leading to:</i></p> <ul style="list-style-type: none"> • idea of conflict / war / social unrest / riots • starvation food shortages / • people encouraged to have small families / • spread of disease or overcrowding / • unequal distribution of resources / • poverty / • migration / • AVP; 	<p>max [1]</p>	<p>ignore education unqualified</p> <p>ignore over population</p> <p>e.g. less employment/pollution</p>
		[Total: 6]	