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

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 will not enter into discussions about these mark schemes.

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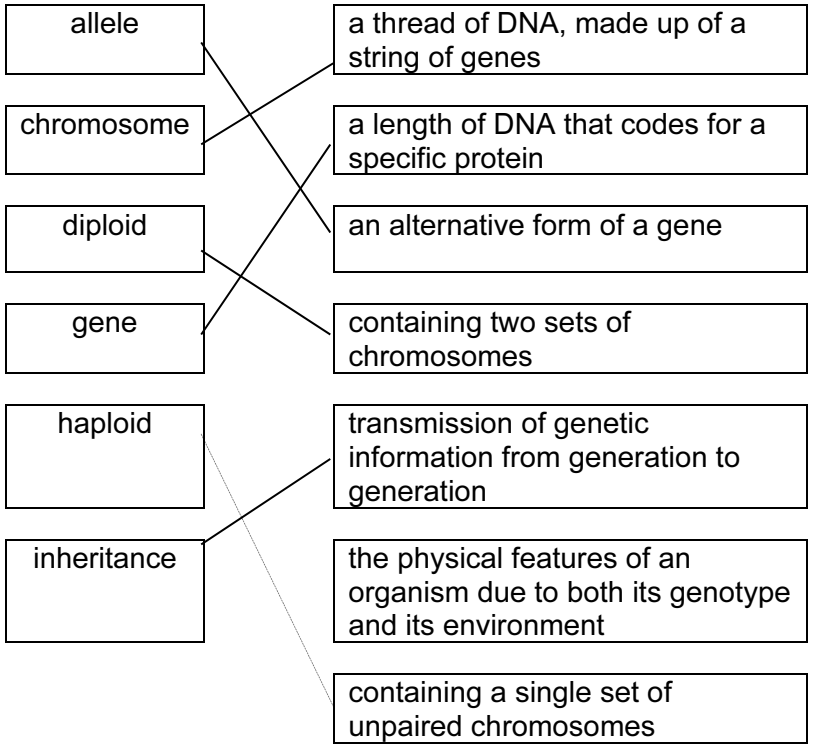
Abbreviations used in the Mark Scheme

- **;** 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

Question	Answer	Marks	Additional Guidance
1	**E** *E. robustus ;* **B** *A. marsupialis ;* **A** *D. bicornis ;* **C** *M. rufus ;* **D** *H. sapiens ;*	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 ; internal environment / AW ;	[2]	
(b) (i)	***F:*** hair ; ***G:*** (temperature) receptors / AW ; ***H:*** sweat gland ;	[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

(ii)	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]	idea of "more" must be expressed at some point **A** water vapour is lost
(iii)	shivering or description ; vasoconstriction / AW ; hairs stand on end ; increased rate of respiration ;	max [2]	
(d)	brain ; hypothalamus ;	max [1]	**ignore** CNS
		[Total: 15]	

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

4 (a)	*growth:* 1. (seedling) increase in size / (dry) mass / AW ; 2. permanent (increase in size) ; 3. larger / more cells ; *development:* 4. cells become specialised ; 5. increase in complexity ; 6. ref. to formation of new (named) structures ;	max [4]	**A** leaves / shoot / roots / stem
(b)	oxygen / O_2 ; water / H_2O ; (suitable) temperature / warmth ;	[3]	in any order
		[Total: 7]	
5 (a)	<table><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td>**E** ;</td><td>testis ;</td></tr><tr><td></td><td>**F** ;</td><td>penis ;</td></tr><tr><td></td><td>**D** ;</td><td>urethra ;</td></tr></table>	[6]	

(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

(b) (i)	**A** ; **E** ;	[2]	either order **A F**
(ii)	glucose + oxygen ; ⟶ 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

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

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

(ii)	*lack of (named) resource leading to:* • 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;	max [1]	**ignore** education unqualified **ignore** over population e.g. less employment / pollution
		[Total: 6]	