

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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Page 2	Mark Scheme	Syllabus	Paper
	Cambridge IGCSE – October/November 2015	0610	21

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

Page 3	Mark Scheme	Syllabus	Paper
	Cambridge IGCSE – October/November 2015	0610	21

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

Page 4	Mark Scheme	Syllabus	Paper
	Cambridge IGCSE – October/November 2015	0610	21

(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]	

Page 5	Mark Scheme	Syllabus	Paper
	Cambridge IGCSE – October/November 2015	0610	21

3	allele chromosome diploid gene haploid inheritance a thread of DNA, made up of a string of genes a length of DNA that codes for a specific protein an alternative form of a gene containing two sets of chromosomes transmission of genetic information from generation to generation the physical features of an organism due to both its genotype and its environment containing a single set of unpaired chromosomes	[5]	1 mark for each correct linkage
		[Total: 5]	

Page 6	Mark Scheme	Syllabus	Paper
	Cambridge IGCSE – October/November 2015	0610	21

4	(a)	<i>growth:</i> 1. (seedling) increase in size / (dry) mass / AW ; 2. permanent (increase in size) ; 3. larger / more cells ; <i>development:</i> 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 / O₂ ; water / H₂O ; (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>								E ;	testis ;		F ;	penis ;		D ;	urethra ;	[6]	
	E ;	testis ;																	
	F ;	penis ;																	
	D ;	urethra ;																	

Page 7	Mark Scheme	Syllabus	Paper
	Cambridge IGCSE – October/November 2015	0610	21

(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

Page 8	Mark Scheme	Syllabus	Paper
	Cambridge IGCSE – October/November 2015	0610	21

(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

Page 9	Mark Scheme	Syllabus	Paper
	Cambridge IGCSE – October/November 2015	0610	21

(b)	J liver ; K stomach ; L large intestine / colon ; M small intestine / ileum ;	[4]	
(c) (i)	<u>950</u> (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

Page 10	Mark Scheme	Syllabus	Paper
	Cambridge IGCSE – October/November 2015	0610	21

(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)	<i>difference:</i> no stationary phase or exponential / log, phase has continued / AW ; <i>explanation:</i> development of farming / improved food supplies / AW ; ref. to sanitation / hygiene / AW ; ref. to medical treatments / care ; use of technology / AW ; AVP ;	max [3]	

Page 11	Mark Scheme	Syllabus	Paper
	Cambridge IGCSE – October/November 2015	0610	21

(ii)	<i>lack of (named) resource leading to:</i> • 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]	