CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge International General Certificate of Secondary Education

MARK SCHEME for the March 2016 series

0610 BIOLOGY

0610/32 Paper 3 Theory (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.

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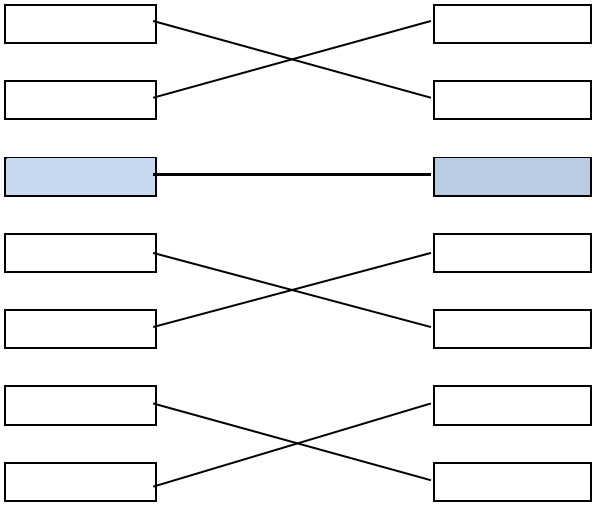
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Abbreviations used in the Mark Scheme:

- ; 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	Mark Scheme	Marks	Guidance
1		[5]	5 or 6 correct = 5 4 correct = 4 3 correct = 3 2 correct = 2 1 correct = 1
		[Total: 5]	

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<table>
<tr><th>Question</th><th>Mark Scheme</th><th>Marks</th><th>Guidance</th></tr>
<tr><td>2</td><td>
<table>
<tr><th>mammal</th><th>feature</th><th>survival advantage</th></tr>
<tr><td>gazelle</td><td>long legs;
large ears;
horns;
eyes placed laterally;
fur pattern;</td><td>escape predators;
warning of danger;
defence ;
to detect predators;
camouflage;</td></tr>
<tr><td>giraffe</td><td>long legs;

long neck;
fur pattern;
long eye-lashes;

eyes placed laterally;
large ears;</td><td>reaching food / escaping predators;
reaching food / leaves;
camouflage ;
protection against dust / insects / thorns;

to detect predators ;
warning of danger;</td></tr>
<tr><td>leopard</td><td>fur pattern;
long tail;
large claws;
long / pointed teeth;
forward facing eyes;
whiskers;</td><td>camouflage;
balance;
disable prey;
disable / eat prey;
focus on prey;
increased sensitivity;</td></tr>
</table>
</td><td>[max 2]

[max 2]

[max 2]</td><td>feature and reason must match for 2 marks

A AVP (visible) with associated reason

A possession of fur for one animal only

A description / AW</td></tr>
<tr><td></td><td></td><td>[Total: 6]</td><td></td></tr>
</table>

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Question	Mark Scheme	Marks	Guidance
3 (a)	protein; that functions as a biological catalyst	[2]	
(b) (i)	*A:* liver; *B:* stomach; *C:* small intestine / ileum; *D:* large intestine / colon;	[4]	
(ii)	*E:* ending in the stomach; *F:* ending on the liver; *G:* ending on the pancreas / wall of ileum; *H:* ending on the anus;	[4]	
(c) (i)	ileum / small intestine / villi;	[1]	
(ii)	diffusion; active transport; ref to glucose being small molecule / soluble; through (thin) wall; into blood / plasma / blood capillary; villi; (villi) provide large surface area (per volume);	[max 2]	**A** absorption into stomach here
		[Total: 13]	
4 (a)	testes; gamete; vagina; egg cell; zygote; uterus; embryo;	[7]	

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Question	Mark Scheme	Marks	Guidance
(b)	release of amniotic fluid / amnion / amniotic sac, ruptures; cervix dilates; uterus muscles / walls contract; mother helps by contracting other muscles / pushing; baby pushed out through vagina; umbilical cord tied and cut; placenta / afterbirth passed out; AVP; (e.g. head normally delivered first)	[max 4]	
		[Total: 11]	
5 (a) (i)	1.2 (dm^3 per min);	[1]	
(ii)	(ecf) 3.3 (dm^3 per min);;	[2]	correct sum (4.5 – 1.2) = 1 mark even if answer is incorrect
(b)	muscles contract; need more energy; muscles respire more; need more oxygen; need more glucose; produce more carbon dioxide; ref to oxygen / glucose / carbon dioxide carried by blood;	[max 3]	"more" / AW must be stated at least once in the explanation – if not max 3 **I** anaerobic respiration
(c) (i)	(1.5 – 0.5 = 1.0) 1.0 / 0.5 × 100 = 200 (%);;	[2]	

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Question	Mark Scheme	Marks	Guidance
(ii)	heat / energy release; from respiration; heat carried by blood; heat lost from skin surface / AW; by sweat; evaporation of; more sweat required / ref to liquid coming from blood; ref to homeostasis; AVP;	[max 3]	**A** heat loss by conduction / convection / radiation
(d)	blood needed in the muscles / at skin surface / AW; digestion not immediately essential / AW; AVP;	[max 1]	
(e)	brain (cell) function has to be constant / cells cannot reduce their energy requirement / AW; brain cells do not require extra energy during exercise / AW; AVP;	[max 2]	
		[Total: 14]	
6 (a) (i)	thread like structure / AW; contains DNA; carries genes / genetic information / hereditary material;	[max 2]	
(ii)	line ending **on** the nucleus;	[1]	

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Question	Mark Scheme	Marks	Guidance
(b)	*parental genotypes:* *Bb* *x* bb; *gametes:* B + b x b + b; *F_1 genotypes:* Bb + bb + Bb + bb; *F_1 phenotypes;* black + white + black + white; *ratio:* 1 black : 1 white;	[5]	
(c)	(male) XY; (female) XX;	[2]	**I** indeterminate letters
		[Total: 10]	
7 (a)	*J* palisade (mesophyll) cell / layer; *K* guard cell;	[2]	**I** mesophyll unqualified **A** vacuole
(b)	carbon dioxide and water; glucose and oxygen;	[2]	either order for both pairs **A** chemical symbols but must be correct **I** energy on LHS **R** energy on RHS
(c) (i)	crop yields increase as more fertiliser is added; at high levels the effect of the fertiliser makes little difference to yields / non-linear / AW; use of data;	[max 2]	

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Question	Mark Scheme	Marks	Guidance
(ii)	light intensity; concentration of carbon dioxide; temperature; (availability of) water; number of chloroplasts / amount of chlorophyll; AVP;	[max 2]	
(d) (i)	kill weeds; (so) more resources / e.g. of, for maize / less competition; more photosynthesis; more energy available (for growth); more glucose / sucrose / starch for cob production;	[max 2]	
(ii)	gene for tasting unpleasant to insects / to poison insects / AW; from another species; inserted into crop plants; into a chromosome; less chemical needed as plants resist insect attack;	[max 2]	
		[Total: 12]	
8 (a)	brain; spinal cord;	[2]	
(b)	light; sound; chemicals; temperature (change); object touching skin; pressure against skin; damage to skin;	[max 3]	**A:** position of body in space / AW; **I** named sense organs

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Question	Mark Scheme	Marks	Guidance
(c)	heat / stimulus detected by sensors / receptors, impulse (generated); passed along sensory neurone; across synapse (somewhere in account); impulse passed to motor neurone, via relay / AW neurone; impulse causes muscles to contract / respond;	[max 4]	
		[Total: 9]	
		Paper Total: 80	

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