CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge International General Certificate of Secondary Education

MARK SCHEME for the October/November 2014 series

0610 BIOLOGY

0610/22 Paper 2 (Core Theory), 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.

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Abbreviations used in the Mark Scheme

- ; separates marking points
- / separates alternatives within a marking point
- R reject
- I ignore (mark as if this material was not present)
- A accept (a less than ideal answer which should be marked correct)
- AW alternative wording
- underline words underlined 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
- A, S, P, L Axes, Size, Plots and Line for graphs
- O, S, D, L Outline, Size, Detail and Label for drawings
- (n)ecf (no) error carried forward
- ( ) 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	Mark	Additional Guidance
1	A; E; B; D; C;	max 4	5 correct = 4 marks 3 or 4 correct = 3 marks 2 correct = 2 marks 1 correct = 1 mark
		[Total: 4]	
2 (a) (i)	G obese; H correct weight; J underweight; K overweight:	2	4 correct = 2 marks 2 or 3 correct = 1 mark 1 correct = 0
(ii)	extend height axis / under 1.4 m tall / over 1.8 m tall; extend mass axis / under 30 kg mass; gender specific chart ; age specific chart; AVP;	max 2	
(b) (i)	lipid / fat / oil; carbohydrate;	2	**A** an example of a fat or a carbohydrate (but only 1 example allowed)
(ii)	(more) muscle contraction; (more) energy needed; (more) respiration; (more stored) fat used; less fat put into storage AW / less conversion of carbohydrate to fat; increases metabolic rate;	max 3	
(iii)	diabetes / high blood pressure / cancer / arthritic leg joints / coronary heart disease / heart attack / heart failure / stroke / blocked arteries;	1	**A** any valid condition

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(c)	source: any fruit / vegetable / cereal / bread qualified / nuts / seeds / named example; importance: cannot be digested / no enzymes to digest it; idea of adds bulk / volume to material in alimentary canal; helps peristalsis / provides material for muscles of AC wall to grip on AW ; prevents constipation / helps in egestion or excretion AW; prevents (colon) cancer; absorbs fats / cholesterol in diet; removal of bacteria; AVP;	**1** **max 3**	
		[Total: 14]	

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<table>
<tr>
<td>3 (a)</td>
<td>
<table>
<tr><th>letter</th><th>name</th><th>function</th></tr>
<tr><td>L</td><td>oviduct / fallopian tube;</td><td>egg released into it / moves (AW) egg / ovum / zygote / sperm swim along it / site of fertilisation;</td></tr>
<tr><td>M</td><td>ovary;</td><td>produces eggs / ova / gamete / produces hormones / reference to Graafian follicle / corpus luteum;</td></tr>
<tr><td>N</td><td>uterus / womb;</td><td>idea of (preparation) for implantation / later development of baby AW / ref. to contractions (during birth);</td></tr>
</table>
</td>
<td>6</td>
<td>mark independently</td>
</tr>
<tr>
<td>3 b</td>
<td>XX XY;
meiosis (in both boxes);
X X;
XX;
mitosis;
XX;</td>
<td>6</td>
<td>can gain marking point 3 even if marking point 1 is incorrect</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[Total: 12]</td>
<td></td>
</tr>
<tr>
<td>4 (a)</td>
<td>
<table>
<tr><th>function of flower part</th><th>letter</th></tr>
<tr><td>forms the seed</td><td>E;</td></tr>
<tr><td>produces pollen</td><td>C;</td></tr>
<tr><td>protects the flower bud</td><td>G;</td></tr>
<tr><td>receives the pollen</td><td>B;</td></tr>
</table>
</td>
<td>4</td>
<td>A correct named structure
ovule
anther
sepal
stigma</td>
</tr>
</table>

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<table>
<tr><td>(b)</td><td>
<table>
<tr><td>part</td><td>difference</td><td>reason for difference</td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td>stamen</td><td>longer filaments or stamens / anthers larger / anthers loosely attached to filament / anthers or stamens hang outside other flower parts AW;</td><td>easily shaken by the wind (to release pollen) / exposed to the wind AW;</td></tr>
<tr><td>pollen</td><td>grains very small / light / smooth / large quantities;</td><td>easily transported by wind / increases chances of landing on stigma;</td></tr>
</table>
</td><td>4</td><td>A alternative wording / other correct information pairs must match</td></tr>
<tr><td></td><td></td><td>[Total: 8]</td><td></td></tr>
<tr><td>5</td><td>
<table>
<tr><td>letter</td><td>name of process</td></tr>
<tr><td>L</td><td>condensation;</td></tr>
<tr><td>M</td><td>precipitation / raining / snowing / hailing;</td></tr>
<tr><td>N</td><td>excretion / urination / defecation / egestion;</td></tr>
<tr><td>P</td><td>respiration;</td></tr>
<tr><td>Q</td><td>transpiration / evaporation;</td></tr>
<tr><td>R</td><td>evaporation;</td></tr>
</table>
</td><td>6</td><td></td></tr>
<tr><td></td><td></td><td>[Total: 6]</td><td></td></tr>
</table>

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6	(a)	chain A llama: 1 herbivore; 2 primary consumer; human: 1 carnivore; 2 secondary consumer; chain B human 1 herbivore; 2 primary consumer;	6	only one consumer level in each box only one of : producer or herbivore or carnivore or decomposer in each box 1 and 2 in any order in each case
	(b)	the position of an organism / feeding level AW; in a food chain / food web / pyramid of biomass / pyramid of numbers / pyramid of energy;	2	
	(c)	beetle box narrower than for aphids, but wider than for the bush and parasite box wider than that for the beetles; parasites beetles aphids bush;	2	both correct for 1 mark **I** depth of boxes all four correct for 1 mark
			[Total: 10]	
7	(a)		4	

statement	aerobic	anaerobic
lactic acid		✓ ;
carbon dioxide	✓	;
glucose	✓	✓ ;
oxygen	✓	;

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(b)	**(i)** 92 (%); **(ii)** 25000 (m); **(iii)** 1500 (m);	**1** **1** **1**	
(c)	racing requires energy; energy is supplied by aerobic **and** anaerobic respiration ; the shorter the race, (100 & 800 m / up to 1500), the less aerobic respiration / more anaerobic respiration; the longer the race, (more than 1500 / 10 000 – 25 000 m) the more aerobic respiration / less anaerobic respiration;	**max 2**	
		[Total: 9]	
8 (a) (i)	carbon dioxide + water; → glucose + oxygen;	**2**	**A** and for + **A** = / combine / make for → **A** correct balanced chemical equation = 2 **A** unbalanced chemical equation = 1 **A** mixed equation = 1 **I** inclusion of chlorophyll / sunlight / energy etc.

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(ii)	absorb AW light (energy); contain / makes chlorophyll; convert light energy to chemical energy; stores starch; AVP;	**max 2**	
(iii)	description: more chloroplasts in the palisade / upper (mesophyll) layer / cells ora; explanation: upper / palisade layer / cells, receive more light / absorbs more light ora;	**2**	**I** ref to chloroplasts near cell margin **I** reference to nearer to sun / surface area
(b) (i)	allows gaseous exchange; allows carbon dioxide into the leaf; allows oxygen to pass out of the leaf;	**max 2**	**I** ref. to water vapour
(ii)	waterproof layer / prevents leaf drying out / AW; prevents wilting; transparent (to let light through); protection qualified;	**max 2**	

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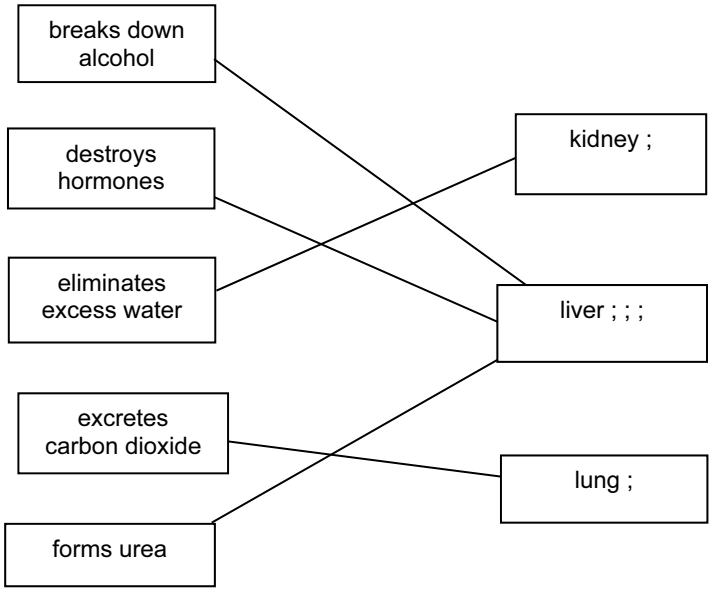
(c)	nitrates contain nitrogen; nitrogen / nitrates, needed to make amino acids / proteins; amino acids / proteins needed, for growth / repair / to make new cells;	**max 2**	**I** nitrates are needed for growth **A** valid use of protein e.g. enzymes
		[Total 12]	
9		**5**	two lines from a LH box = 0 marks for that box
		[Total: 5]	

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