UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the May/June 2012 question paper

for the guidance of teachers

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 must be read in conjunction with the question papers and the report on the examination.

- Cambridge will not enter into discussions or correspondence in connection with these mark schemes.

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International Examinations

General notes

Do not exceed the section sub-totals or question maxima.

Symbols used in mark scheme and guidance notes.

/ separates alternatives for a marking point

; separates points for the award of a mark

MP mark point – used in guidance notes when referring to numbered marking points

ORA or reverse argument / reasoning

OWTTE or words to that effect

A accept – as a correct response

R reject – this is marked with a cross and any following correct statements do not gain any marks

I ignore / irrelevant / inadequate – this response gains no mark, but any following correct answers can gain marks.

( ) the word / phrase in brackets is not required to gain marks but sets the context of the response for credit.
e.g. (waxy) cuticle. Waxy not needed but if it was described as a cellulose cuticle then no mark is awarded.

<u>mitosis</u> underlined words – this word only

1	**(a)** **A** – *A. australis*; **B** – *E. crestatus*; **C** – *C. casuarius*; **D** – *S. camelus*; **E** – *P. adeliae*; [5] **[Total: 5]**	
2	**(a)** **(i)** **C**; (vessel returning blood from the body) **H**; (chamber which pumps blood to the body) **D**; (vessel which carries blood to the lungs) **E**; (vessel carrying blood at the highest pressure) [4]	
	(ii) 1 prevents backflow of blood; 2 from artery / aorta / **E** / to ventricle / **H**; [2]	A – when ventricle relaxes
	(b) **(i)** 1 exercise / running needs more energy; 2 body / muscles / cells respire more rapidly; 3 (body / muscles / cells) need more oxygen / glucose; 4 (heart) pumps blood faster (to supply this); 5 removes carbon dioxide / heat; Any three – 1 mark each [3]	Candidate only needs refer to "more" (or equivalent term) once.
	(ii) 1 identified suitable position / where artery crosses a bone / OWTTE; 2 press on spot with <u>finger</u>; 3 (count) number of beats per minute Any two – 1 mark each [2]	1 A – carotid or radial pulse, wrist, neck 2 A – ref to digital pulse meter
	[Total: 11]	

3 (a) (i)

area	contains starch
K	×
L	✓
M	×
N	×

area L correct;
areas K, M and N correct; [2]

(ii) (area K)
1 has no chlorophyll / chloroplasts;
2 cannot photosynthesise / form starch;
(area L)
3 has both light and chlorophyll / chloroplasts;
4 can photosynthesise / form starch; [4]

(iii) photosynthesis; [1]

(iv) oxygen [1]

(b) (i) root hair (cell); [1]

(ii) 1 from soil water / in solution in soil water;
2 by diffusion;
3 down concentration gradient;
any two – 1 mark each [max 2]

[Total: 11]

4 **(a)** **(i)**	**A** – prostate (gland); **B** – urethra; [2]	
(ii)	line to testis labelled **T**; [1]	
(iii)	puberty; [1]	
(iv)	1 causes increased growth of limb bones; 2 causes increased muscle development / growth; 3 increases lung capacity; any two – 1 mark each [max 2]	
(b)	1 can kill sperm / cause sterility; 2 testes contain dividing cells; 3 undergoing meiosis / gamete formation; 4 X-ray / radiation may cause damage to nucleus; 5 that may result in defects / mutations; 6 can be passed on to offspring; any three – 1 mark each [max 3]	1 A – cause cancer of the testes 4 A – chromosomes, genes, DNA
	[Total: 9]	

5 **(a)** **(i)** Brazil; [1]		
(ii) (10561 – 7181) 3380 (ha); [1]		
(iii) loss = $\frac{(10561-7181)\times 100}{10561}$		A – ecf of value from **(a)(ii)**
= 32(.00) (%);; [2]		Correct answer but no working shown = 2 marks
(b) 1 removes habitats (for wildlife / animals); 2 disrupts food chains; 3 leads to loss of species / reduces biodiversity; 4 exposed soil dries out / desertification may occur; 5 easily eroded; 6 less transpiration / evaporation; 7 less cloud formation / rainfall; 8 (burning) increases carbon dioxide content of the air; 9 less photosynthesis so more carbon dioxide in air; any four – 1 mark each [max 4]		5 A – refs to landslips
[Total: 8]		

6	**(a) (i)**	homeostasis; [1]	
	(ii)	respiration; [1]	
	(b) (i)	72 (mg per 100 cm^3); [1]	
	(ii)	150 (mg per 100 cm^3); [1]	
	(c) (i)	letter G on rising line (8am – 10am) before turndown; [1]	
	(ii)	(glucose converted to) <u>glycogen</u>;	
	(iii)	(stored in cells of) liver / muscles; [2]	A – named muscle
	(d) (i)	dropped / decreased / goes from 72 to 55 mg per 100 cm^3 of blood; [1]	
	(ii)	adrenaline; [1]	
	(iii)	1 increase in metabolic activity / OWTTE; 2 increase in heart rate; 3 glycogen converted to glucose; 4 increase blood glucose level; 5 increase rate of respiration; any three – 1 mark each [3]	1 A – chemical reactions / processes occur more rapidly 2 A – increase in stroke volume
		[Total: 12]	

7	**(a)** **(i)**	collects food / nectar / pollen; [1]	
	(ii)	bring about pollination; [1]	A – description of pollination
	(iii)	1 smell / scent / odour; 2 colour of petals; 3 shape / size of petals; any two – 1 mark each [max 2]	
	(b)	1 pollen grain produces pollen tube; 2 male gamete formed inside pollen grain; 3 pollen tube grows down through stigma and style; 4 enters ovule; 5 male gamete passes along pollen tube; 6 fuses with female gamete (in ovule); any three – 1 mark each [max 3]	
	(c)	1 (new plant) genotype different to original parents; 2 it has genes from female parent / gamete; 3 it has genes from male parent / gamete; 4 phenotype may show features from both parents; 5 also affected by environmental factors; any three – 1 mark each [max 3]	
		[Total: 10]	

8	(a)	(i)	(sparrow) hawk insect-eating bird caterpillar tree layers in Fig. 8.1 labelled from top to bottom [1]	A – small birds
		(ii)	4 blocks to pyramid widening from top to bottom / triangle shaped pyramid widest at base; labelled as per (a)(i) / other appropriate labels; [2]	
		(iii)	only 1 tree but has mass larger than any other layer in pyramid / OWTTE; [1]	
	(b)	(i)	caterpillar; [1]	A – insect
		(ii)	insect-eating birds / (sparrow) hawk; [1]	A – small birds / bird
		(iii)	decomposers / bacteria / fungi; [1]	
			[Total: 7]	

9 (a) (i) gets brighter / increases (at T); [1]

(ii) 1 increase in light intensity detected by retina;
2 impulses to iris (via brain)
3 (iris) circular muscles contract;
4 (iris) radial muscles relax;
5 making pupil smaller;
any three – 1 mark each [max 3]

(b) (i) 1 rapid / immediate;
2 specific response to specific stimulus;
3 automatic / no conscious thought;
any two – 1 mark each [max 2]

(ii) protects retina / light sensitive cells from damage (by too much light); [1]

[Total: 7]