CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the May/June 2014 series

0610 BIOLOGY

0610/22 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.

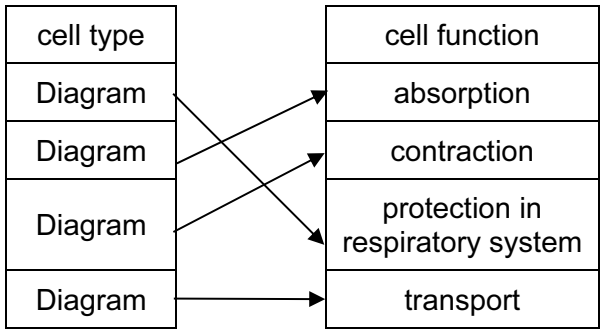
Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the May/June 2014 series for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level components.

CAMBRIDGE
International Examinations

	Answer	Marks	Guidance for Examiners
1	**A** *C. australis;* **B** *C. edule;* **C** *F. aperta;* **D** *T. regina;* **E** *L. littorea;*	max [4]	5 correct = 4 3 or 4 correct = 3 2 correct = 2 1 correct = 1
		[Total: 4]	
2 (a)	asexual + sexual; gamete + gamete; fertilisation;	[3]	both correct for 1 mark both correct for 1 mark
(b)	(potatoes have) tubers; idea of tubers growing into plant; photosynthesising; plant produces more tubers; mitosis;	max [3]	
		[Total: 6]	

3 (a) (i)	36.8;	[1]	
(ii)	4 / fourth day;	[1]	
(ii)	so that no other factor / variable could affect her temperature / **AW**; so that she remembers to do it / **AW**;	max [1]	
(b) (i)	oestrogen;	[1]	
(ii)	(in the) blood / bloodstream / plasma;	[1]	
		[Total: 5]	
4 (a)	group of cells with similar structure and function / **AW**;	[1]	
(b)		max [3]	4 correct = 3 2 or 3 correct = 2 1 correct = 1
(c) (i)	the movement of molecules / particles; from a region of higher concentration to lower concentration / down a concentration gradient / **AW**;	[2]	
(ii)	oxygen / O_2; glucose / amino acids / mineral; carbon dioxide / lactate / lactic acid;	[3]	
		[Total: 9]	

5 (a) (i)	carbohydrates; fats; proteins;	max [2]	
(ii)	anaemia / reduced oxygen transport / symptoms of anaemia;	[1]	
(iii)	Rickets / poor formation of bones or teeth;	[1]	
(b) (i)	gender / sex; age; occupation / activity;	max [2]	
(ii)	(idea of) requirement is less than intake / use of figures from bar chart / **ORA**; excess will be converted to fat (for storage) / **AW**;	[2]	
(c) (i)	(molecule) cannot be absorbed / too big / insoluble;	max [1]	
(ii)	enzyme / amylase (in saliva); converts starch to sugar / maltose / glucose;	max [2]	
(iii)	provides protein / amino acids;	[1]	**AVP** e.g. iron
(iv)	bread; pasta; corn; potatoes; maize; cassava;	max [2]	**A** any valid food with high starch content
(v)	excessive weight gain / obesity; blockage of blood vessels / **AW**; heart disease; diabetes; joint damage / **AW**;	max [2]	**A** skin blemishes
		[Total: 16]	

6 (a)	32 – 24 = 8; 3:1;	 [2]	
(b)	parents: Dd ; Dd ; gametes: D and d, D and d ; offspring genotype: DD Dd Dd dd ; offspring phenotypes: Dark Dark Dark Light ;	 max [5]	Allow ecf at each stage if a mistake is made, but each line must correspond to the previous one.
(c) (i)	mutation	[1]	
(ii)	radiation / UV light / X-rays; chemical (pollution) / named chemical;	 [2]	
		[Total: 10]	
7 (a)	oak tree / leaves of oak tree; carabid beetle / great tit / sparrow hawk;	 [2]	
(b)	carabid beetle and great tit;	[1]	
(ii)	25;	[1]	
(c)	110 + 104 / 214; (proportion) 214 ecf ÷ 990; (%) 0.216 ecf × 100 = 21.6 (%);	 [3]	

(d)	insecticide is persistent / not broken down; larvae contain insecticide; great tits consume many larvae; (idea of) insecticide passes up chain; hawks consume many great tits; so insecticide becomes concentrated;	max [3]	
		[Total: 10]	
8 (a) (i)	P alongside line between carbon dioxide in air and carbon compounds in plants;	[1]	
(ii)	carbon dioxide + water; = glucose / simple sugar + oxygen;	[2]	
(iii)	chlorophyll;	[1]	**R** chloroplast
(iv)	fewer plants; less photosynthesis; less carbon dioxide removed from the atmosphere; burning/decomposition of cut-down trees;	max [2]	
(b)	X respiration; Y feeding / nutrition / eating / **AW**;	[2]	

<table>
<tr><td>(c) (i)</td><td>increases carbon dioxide level;</td><td>[1]</td><td></td></tr>
<tr><td>(ii)</td><td>fungi / bacteria / saprophyte / saprotroph;</td><td>max [1]</td><td></td></tr>
<tr><td>(iii)</td><td>supplies minerals / mineral ions / fertilisers / nitrates / phosphates to soil;

releases carbon dioxide to the atmosphere;

heats the soil;</td><td>max [2]</td><td></td></tr>
<tr><td></td><td></td><td>[Total: 12]</td><td></td></tr>
<tr><td>9 (a)</td><td>coughing; prevents blockage of trachea/windpipe;

sneezing; clears particles from nose;

pupil reflex; prevents damage to the retina;

accommodation reflex; allows focussing of light onto retina;</td><td>[2]</td><td></td></tr>
<tr><td>(b)</td><td><table><tr><td></td><td>Nervous</td><td>Hormonal</td></tr><tr><td>signal type</td><td>electrical</td><td>chemical;</td></tr><tr><td>transmission route</td><td>nerves / neurons</td><td>blood;</td></tr><tr><td>transmission speed</td><td>fast(er)</td><td>slow(er);</td></tr><tr><td>duration of effect</td><td>short(er)</td><td>long(er);</td></tr></table></td><td>max [4]</td><td></td></tr>
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(c) (i)	(positive) phototropism;	[1]	**R** negative phototropism
(ii)	(plant bends towards the light) to gain more energy / **AW** / increased photosynthesis / **AW**;	[1]	
		[Total: 8]	