www.XtremePapers.com

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the October/November 2011 question paper for the guidance of teachers

0610 BIOLOGY

0610/23 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.

Cambridge is publishing the mark schemes for the October/November 2011 question papers for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level syllabuses and some Ordinary Level syllabuses.

UNIVERSITY of CAMBRIDGE
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

© University of Cambridge International Examinations 2011

Question	Mark Scheme	Mark	Guidance
1 (a)	arachnids ✓; crustaceans; insects; myriapods	[1]	if more than 1 box ticked no mark
(b)	crab: name of arthropod A: *Araneus;* B: *Buthus;* C: *Hydrachna;* D: *Ixodes;* E: *Oligolophus;* any four correctly named – 1 mark each	[4]	two or more names in a line mark the first.
		[Total: 5]	

© University of Cambridge International Examinations 2011

2	(a)	**M** – trachea; **N** – bronchus; **O** – bronchioles;	[3]	A – cartilage, windpipe A – bronchi, I – ref to position left/right A – alveolus / alveoli
	(b)	observe rise and fall of chest / OWTTE; count number of inhalations in known period of time;	[2]	A – ref to breathing monitors A – 15 s to 5 mins
	(c)	**(i)** male 1;	[1]	
		(ii) female 2;	[1]	
		(iii) 1 breathing rate rises with exercise; 2 the rise in breathing rate varies from person to person; 3 (on average) males have higher breathing rates, before running / resting / after running than females/ OWTTE / ORA; any two – 1 mark each	[2]	
	(d)	1 exercise needs (extra) energy; 2 energy released by respiration; 3 in muscles; 4 (more) oxygen needed; 5 (more) carbon dioxide to be removed; 6 increased breathing rate to provide the oxygen / remove the carbon dioxide; any four – 1 mark each	[4]	more required at least once in the logical progression – penalise once for complete absence I – refs to anaerobic respiration
			[Total: 13]	

© University of Cambridge International Examinations 2011

3	(a)	1 less competition for (rooting) space; 2 less competition for light; 3 less competition for minerals / salts; 4 less competition for water; 5 less risk of all destroyed by disease / disaster; 6 colonisation of new places; any three – 1 mark each	[3]	all points in context of either parent-seedling or seedling-seedling competition MP3 A – ions / named examples I – ref to nutrients MP1–5 A – less competition unqualified for 1 mark if no specific examples given A – ref to fires
	(b)	**(i)** growth of stem; towards light; **OR** growth of root; away from light; **OR** growth of plant; towards or away from light; **(ii)** shoot / plumule / stem grows towards light; gets (more) light for photosynthesis; **OR** root / radicle grows away from light / into soil (if root exposed); improves anchorage / reaches water / minerals; any two – 1 mark each	[2] [2]	A – refs to chlorophyll formation
			[Total: 7]	

© University of Cambridge International Examinations 2011

4	**(a)**	**(i)** 1 by diffusion; 2 through root hairs; 3 from soil water / in solution in soil water; 4 down concentration gradient; Any two – 1 mark each	[2]	MP1 A – ref to active transport MP4 A – against the concentration gradient (linked to active transport)
		(ii) fungi / bacteria;	[1]	A – decomposers
	(b)	**(i)** to allow them to be absorbed / carried in plasma;	[1]	
		(ii) bone / tooth / muscle;	[1]	A – ref to enamel or dentine
	(c)	1 minerals in dung / faeces; 2 a concentrated / rich source of phosphates; 3 excreta broken down / minerals released into soil; 4 replaces phosphates removed by plants / crops; 5 thus new plants / crops grow well / no deficiency; 6 thus minerals recycled; any three – 1 mark each	[3]	
			[Total: 8]	
5	**(a)**	*substance* / *enters the blood* / *leaves the blood*: lungs; liver; kidney;	[3]	A – alveoli A – Bowman's capsule / glomerulus
	(b)	prevents / reduces risk of microorganisms entering blood / tissues; stops / reduces loss of blood;	[2]	A – ref to bacteria / viruses I – ref to germs
			[Total: 5]	

© University of Cambridge International Examinations 2011

6	(a)	**(i)** (tropic level) 1 / producers**;**	[1]	I – ref to primary
		(ii) cheetah / hyena / lion**;**	[1]	
	(b)	**(i)** (animal / consumer / organism) that eats plants / vegetation**;** it eats <u>only</u> plants / does not eat meat / other consumers**;**	[2]	A – ref to animal that gets energy from plants
		(ii) because of its size it is basically free of predators**;**	[1]	
	(c)	**(i)** bacteria / fungi / (fly) maggots**;**	[1]	A – named example
		(ii) 1 various mineral / ions removed from soil by plants**;** 2 need to be replaced**;** 3 or plant regrowth is restricted**;** 4 decomposers release minerals from dead remains**;** 5 without this action get build up of dead material**;** 6 also soil becomes less fertile**;** any three – 1 mark each	[3]	A – MP1, 3 and 4 in terms of carbon dioxide
	(d)	grass, zebra / impala, cheetah, hyena OR acacia, impala, cheetah, hyena chain of four organisms from food web**;** shown in correct order**;** arrows showing direction of energy flow**;**	[3]	**NO MARK**
			[Total: 10]	

© University of Cambridge International Examinations 2011

7		1 herbicides kill competing species / weeds; 2 reduces competition for minerals / ions; 3 reduces competition for light / removes shading of crop; 4 reduces competition for water; 5 reduces competition for space 6 some weeds have antagonistic effect of crop plants; 7 crop grows faster / process bigger yield; 8 weeds can harbour harmful bacteria / fungi / insects; any four – 1 mark each	[4]	A – named example, I – ref to nutrients MP2–5 A – less competition unqualified for 1 mark if no specific examples given MP8 A – in context of harm to crop plant, A – pests
			[Total: 4]	
8	**(a)**	1 growth / germination needs energy; 2 seed respires; 3 using food reserves / named example; 4 no photosynthesis happening; any three – 1 mark each	[3]	A – carbohydrate, starch, sugar, glucose, fat
	(b)	1 shoot above ground; 2 leaves are green; 3 exposed to light; 4 photosynthesis starts; 5 new materials formed / named example; 6 more formed than reserves used up; any three – 1 mark each	[3]	
	(c)	13 days;	[1]	A – 12.8 to 13.2 days
			[Total: 7]	

© University of Cambridge International Examinations 2011

<table>
<tr><td>9 (a)</td><td>(i) A – sperm cell;
B – white blood cell / phagocyte / leucocyte;

(ii) fusing with ovum / egg (cell) / fertilisation / forming zygote;
has tail to swim to reach ovum;

(iii) to surround / engulf / digest / destroy microorganisms / phagocytosis;</td><td>[2]

[2]

[1]</td><td>A – lymphocyte

I – ovule
A – is haploid, streamlined, has acrosome, mitochondria,

A – produce antibodies</td></tr>
<tr><td>(b)</td><td><table><tr><th>type of cell</th><th>number of chromosomes</th></tr><tr><td>nerve cell C</td><td>46</td></tr><tr><td>cell A</td><td>23;</td></tr><tr><td>cell B</td><td>46;</td></tr><tr><td>red blood cell D</td><td>0;</td></tr></table></td><td>[3]</td><td></td></tr>
<tr><td></td><td></td><td>[Total: 8]</td><td></td></tr>
</table>

© University of Cambridge International Examinations 2011

10 (a)	**(i)** when both of a pair of alleles are identical / same;	[1]	A – genes for alleles
	(ii) (thalassaemia allele is) recessive; present in both parents but not affecting them / OWTTE;	[2]	
	(iii) TT **and** Tt;	[1]	
(b)	1 parent genotypes Tt and Tt; 2 gametes T t T t ; 3 offspring genotypes TT Tt Tt tt; 4 phenotypes not affected not affected not affected affected;	[4]	apply ECF for lines following from an erroneous line NB – MP4 must have at least one affected offspring to answer question
(c)	**(i)** iron;	[1]	
	(ii) have insufficient / malformed haemoglobin; therefore cannot carry enough oxygen; thus cannot release sufficient energy by respiration; any two – 1 mark each	[2]	
		[Total: 11]	

© University of Cambridge International Examinations 2011