CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the October/November 2012 series

0610 BIOLOGY

0610/21 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.

Cambridge will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the October/November 2012 series for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level components.

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Question	Mark Scheme	Mark	Guidance
1 (a)	fish; reptile;	 [2]	1st or 2nd space 1st or 2nd space
(b)	mammal; bird;	 [2]	 2nd space A – scientific names for the classes R – named examples e.g. shark, dog, etc.
		[Total: 4]	

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Question	Mark Scheme	Mark	Guidance
2 (a)	**X** – iris; **Y** – retina; **Z** – optic nerve;	[3]	
(b)	1 ciliary muscles contract; 2 tension on (suspensory) ligaments less; 3 lens no longer stretched; 4 becomes more convex / curved; 5 refracts / bends light (rays) more; 6 (brings focus) on to the retina / fovea; any four – 1 mark each	[4]	1 R – wrong muscle 1 Ig – muscle unqualified 2 A – ligaments less taut / slackened 3 A – under less tension / no tension 4 A – rounded / fatter / wider 5 A – reduces focal length 6 A – yellow spot
(c)	**(i)** 1 axes correctly labelled with units; 2 suitable scales used and uses at least half of the grid; 3 five points plotted correctly; 4 points joined;	[4]	Ig – orientation A – ± half a square R – line extrapolated to 0.0
	(ii) distance as shown by candidate's graph ± 1;	[1]	likely to be 15 (cm)
	(iii) age as shown by candidate's graph ± 1	[1]	likely to be 47 (years)
		[Total: 13]	

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3	**(a)**	1 blood unable to reach muscle (in shaded region); 2 less / no oxygen / glucose reaches muscle; 3 less / no respiration; 4 less / no energy release; 5 (muscle) cells die; 6 causes a heart attack; any three – 1 mark each	[3]	lg – nutrients
	(b)	1 exercise (regularly); 2 reduce / stop smoking (tobacco); 3 reduce (animal / saturated) fat / cholesterol in diet; 4 lose weight; 5 reduce salt intake; 6 avoid stressful lifestyles; 7 use of medication qualified; any three – 1 mark each	[3]	A – examples of exercise lg – refs to balanced diet lg – refs to visits to doctor
			[Total: 6]	

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4	(a)	(i) **A** – ovary; **B** – ovule;	[2]	R – ovum
		(ii) **C** – style/stigma; **D** – sepals;	[2]	A – calyx
	(b)	plumule correctly labelled; radicle correctly labelled; testa correctly labelled;	[3]	
	(c)	by animals / mammals / birds; by wind; by water; by explosive mechanisms; any two – 1 mark each	[2]	A – agents or methods
	(d)	oxygen; water / moisture; suitable temperature / warmth; food store; any three – 1 mark each	[3]	lg – refs to light lg – refs to humidity lg – refs to heat / temperature unqualified A – named example
			[Total: 12]	

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5	**(a)**	**(i)** respiration;	[1]	
		(ii) combustion;	[1]	A – burning
	(b)	**(i)** fungi/bacteria;	[1]	A – decomposers
		(ii) moisture / water; warmth / suitable temperature; oxygen; any two – 1 mark each	 [2]	A – dampness, humidity Ig – refs to light Ig – refs to heat unqualified Ig – air
	(c)	**(i)** C;	[1]	
		(ii) water **and** carbon dioxide; glucose / sugar;	 [2]	**both** for the mark Ig – refs to carbohydrates / starch
		(iii) light / sunlight;	[1]	Ig – sun / radiation / solar energy
	(d)	1 carbon dioxide trapped in plant / used in photosynthesis; 2 released (as carbon dioxide) during decay / in burning / in respiration; 3 carbon is recycled / reused; 4 light energy trapped (in plant) by Photosynthesis; 5 (light energy) changed to chemical energy; 6 (energy) lost (as heat) to environment / not released as light energy / light cannot be recycled; three – 1 mark each	 [max. 3]	 A – carbon not lost
			[Total: 12]	

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6	**(a)**	1 increased muscle activity; 2 increased / faster release of energy / heat; 3 from increased respiration; any two – 1 mark each	[2]	A – muscle movement, contraction only need ref to increase once A – use more energy
	(b)	**(i)** maintenance of a constant internal environment;	[2]	A – ref to keeping within narrow limits A – in context of named examples
		(ii) 1 sweat secreted (onto surface of skin / body); 2 water evaporates; 3 this process needs heat / energy; 4 ref to latent heat (of vaporisation); 5 body temperature falls; any three – 1 mark each	[3]	A – released A – water and salts Ig – refs to sweat A – vapour takes energy / heat with it A – cools the body
			[Total: 7]	

7	**(a)**	<u>mitosis</u>; same; diploid; <u>meiosis</u>; half; haploid; gametes; fertilisation;	[8]	Must be in correct position in sentences
			[Total: 8]	

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8 (a)	<table><tr><th>label number</th><th>present in both animal and plant cells</th></tr><tr><td>1</td><td></td></tr><tr><td>2</td><td></td></tr><tr><td>3</td><td>✓</td></tr><tr><td>4</td><td></td></tr><tr><td>5</td><td>✓</td></tr><tr><td>6</td><td>✓</td></tr></table> correct ticks – 1 mark each	[3]	lg – any crosses Four ticks MAX 2 if two are correct Five ticks MAX 1 Six ticks MAX 0
(b)	1 chloroplast / 1; 2 carry out photosynthesis / absorb light 3 cell wall / 4; 4 give shape / provides support / protected cell; 5 vacuole / 2; 6 reserve / store of water / salts / provides support; any two pairs – 2 marks each	[4]	correct feature must be stated to award function mark
(c)	**(i)** nucleus;	[1]	
	(ii) carrying / transporting oxygen; contains haemoglobin / large surface area;	[2]	A – ref to no nucleus qualified by idea can contain more haemoglobin / carry more oxygen
		[Total: 10]	

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9	(a)	food chain shows energy transfer from one organism to next organism; food web shows energy transfer through an ecosystem;	[2]	A – only one organism at each (trophic) level A – can have more than one organism at (trophic) levels A – food web is a network of linked food chains
	(b)	**(i)** snake / lizard / bat / badger / eagle / coyote / mountain lion;		
		(ii) producer – sage brush / prickly pear (cactus) / (desert) flowers;		A – bushes, cactus
		(iii) rabbit / insects / deer (and other grazers) / squirrel (and other small rodents);	[3]	
	(c)	(no mountain lions / extinction) leads to increase in numbers of deer (and other grazers); more food for coyotes; leads to increase in numbers of coyotes;	[3]	A – alternative routes that lead from mountain lion to coyotes via deer, producers, insects, lizards, etc. A – less competition for food
			[Total: 8]	

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