



eduresourceza.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

0610/32

Paper 3 (Extended 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.

Page 2	Mark Scheme: Teachers' version	Syllabus	Paper
	IGCSE – October/November 2011	0610	32

Question	Expected Answers	Marks	Additional Guidance
1	(a) A left atrium ; B mitral / bicuspid / atrioventricular, <u>valve</u> ; C semi-lunar <u>valve</u> / pocket <u>valve</u> / aortic <u>valve</u> ; D right ventricle ;	[4]	<i>reject if correct and incorrect answers given for each</i> A atria A auricle A 'oracle' / 'oricle' A if given the plural A if given the plural, A 'half-moon' valve
	(b) E (superior / anterior) vena cava ; F aorta ;	[2]	
	(c) coronary ; 1 fatty deposit in (wall of) artery ; 2 blocks, artery / restricts, blood flow ; 3 restricts, oxygen / nutrient, supply ; 4 blood clotting occurs ;	[1] [max 2]	R cardiac A phonetic spellings <i>ignore incorrect name for MP1–4</i> A atheroma / plaque A cholesterol / LDL / fatty acids A arteriosclerosis / described A 'narrows' artery R if 'to body' ignore high blood pressure
	(d) heart not pumping blood / keeps blood circulating ; blood is oxygenated ; carbon dioxide is removed from blood ;	[max 2]	A blood not pumped to the lungs A exchange of oxygen and carbon dioxide for two marks ignore 'to keep patient alive' / 'supply heart with blood'
	(e) 1 ref. to (cardiac) muscle ; 2 ref. to myogenic / heart has own pacemaker ; 3 <u>septum</u> (divides heart into two) ; 4 two (separate) ventricles / AW ; 5 ventricle(s), contract / pump ; 6 increase blood pressure ; 7 right <u>ventricle</u> has thin(er) wall / left <u>ventricle</u> has thick(er) wall ; 8 so low(er) pressure / higher pressure ; (in context) 9 to lungs / to rest of body ; (in context)	[max 4]	R 'push' A bigger , R tougher A muscle A 'to whole body' for LV if blood to lungs described
		[Total: 15]	

Page 3	Mark Scheme: Teachers' version	Syllabus	Paper
	IGCSE – October/November 2011	0610	32

Question	Expected Answers	Marks	Additional Guidance
2	(a) <i>whole / part of, organism</i> changes in position / changes in place ;	[1]	ignore locomotion A (moves) from place to place / one place to another
	(b) (i) <u>antagonistic</u> ;	[1]	A antagonism
	(ii) <i>idea of muscle pull (don't push) ;</i> biceps contracts ; triceps relaxes ; <i>flexion / described as movement of (fore)arm ;</i> during relaxation muscle is, stretched / passive ; both contract to maintain position / holding an object ;	[max 3]	<i>assume answer is about flexion – credit ora for extension – mark through if both given</i> if answer does not mention the names of the muscles but has the right idea for one contracts and the other relaxes, then allow one mark for MP2+3 contraction and relaxation of the pair must be linked to the correct movement of the arm. If not, no marks R hand A named correct bone – radius and/or ulna A lengthens
	(c) (i) <i>transmits impulses</i> from, receptor / nerve endings / sensory endings / skin / sensory organ ; to, CNS / spinal cord / connector neurone / relay neurone ;	[2]	ignore sensory neurone as question says 'describe' ignore 'messages' / 'signals' / 'senses the stimulus' R 'fingers' / 'hand' A interneurone R 'brain' / 'brain and spinal cord'
	(ii) <i>idea that <u>impulses</u> stimulate muscle to, contract / move hand ;</i> (only) biceps contracts (to raise the forearm) ; ref. to impulse does not cross synapse to H ;	[2 max]	<i>assume answer is about neurone G, but accept about H</i>
	(d) 1 many / different, stimuli ; 2 brain, decides / controls / coordinates ; 3 <u>impulses</u> in <u>motor</u> , neurones / nerves ; 4 to, (many) muscles / effectors (involved) ;	[max 2]	R if one muscle
		[Total: 11]	

Page 4	Mark Scheme: Teachers' version	Syllabus	Paper
	IGCSE – October/November 2011	0610	32

Question		Expected Answers		Marks	Additional Guidance
3	(a)	1	root hairs ;	[max 3]	A down a water potential gradient ignore water concentration R dilute and concentrated A semi-permeable / selectively permeable
		2	water moves from high(er) <u>water potential</u> to low(er) <u>water potential</u> ;		
		3	osmosis ;		
		4	through partially permeable <u>membrane</u> ;		
		5	ref. to protein pores ;		
	(b)	1	large surface area ;	[max 3]	A minerals for ions A thin wall as 'cell' is in the question A active, uptake / transport, uses energy A active uptake R if water also taken up by active uptake A 'moving against concentration gradient' for active transport
		2	thin (cell) walls ;		
		3	(many) mitochondria ;		
		4	ref. respiration ;		
		5	provide / release, energy, for active transport ;		
		6	proteins / carriers / channels, for, diffusion / active transport (of ions) ;		
	(c)	in appropriate boxes		[2]	A ecf if half incorrect diploid number <i>only allow ecf if both diploid numbers are the same</i>
		adult and zygote = 90 ; ovum = 45 ;			

Downloaded from eduresourceza.com

Page 6	Mark Scheme: Teachers' version	Syllabus	Paper
	IGCSE – October/November 2011	0610	32

Question			Expected Answers	Marks	Additional Guidance
4	(a)	(i)	lymphocyte ;	[1]	ignore leucocyte A phonetic spellings
		(ii)	1 attach to, bacteria / viruses / pathogens ; 2 cause them to, aggregate / stick together / AW ; 3 stop them spreading ; 4 help phagocytes engulf them ; 5 cause <u>bacteria</u> to burst / kill <u>bacteria</u> / destroy bacteria ; 6 stop <u>bacteria</u> moving / immobilise <u>bacteria</u> ; 7 neutralise, toxins / poisons / harmful substances ; 8 stop, viruses / bacteria, entering cells ;	[max 2]	A antigens R 'fight' against <i>anywhere in the answer</i> A opsonisation / described A 'makes bacteria more detectable by phagocytes' ignore 'dissolve bacteria' A 'detoxify'
	(b)	(i)	1 when blood clots / following a cut / when wounded / AW ; 2 when blood vessels are damaged ; 3 on exposure of, blood / fibrinogen, to air ; 4 flows over rough surfaces / AW ;	[max 1]	A injury
		(ii)	1 (fibrinogen is converted into) <u>insoluble</u> (fibrin) ; 2 forms, mesh / net / network / strands ; 3 traps, (red) blood cells / platelets ; 4 (dries) to form a scab ; 5 prevents, loss of blood / more bleeding ; 6 prevents infection / AW ;	[max 3]	<i>assume answer is about fibrin</i> A 'gauze' / threads / fibres / web A prevents entry of (named) pathogens R foreign bodies

Page 7	Mark Scheme: Teachers' version	Syllabus	Paper
	IGCSE – October/November 2011	0610	32

Question		Expected Answers	Marks	Additional Guidance
	(c) (i)	5°C – low (kinetic) energy / slow movement of molecules ; low frequency of / few, collisions ; 70°C – enzyme <u>denatured</u> ; ref. to active site / shape of enzyme ;	[max 3]	<i>accept that 'it' refers to the enzyme</i> denatures active site = 2 marks, A thrombin for enzyme R if 'die' / 'die and denature' A 'deformed' / AW, active site / enzyme
	(ii)	time taken for fibrin to form / liquid to become sticky / AW ; time taken for fibrinogen / substrate to disappear ; how much fibrin produced in, unit time / stated time ; how much fibrinogen converted, in unit time / stated time ;	[max 1]	A rate of fibrin production / how long it takes blood to clot / form a mesh / to reach same viscosity R 'how long it took a scab to form' A product for fibrin A substrate for fibrinogen
	(iii)	pH ; volume of, enzyme / thrombin (solution) ; concentration of, enzyme / thrombin (solution) ; volume of, substrate / fibrinogen (solution) / blood ; concentration of, substrate / fibrinogen (solution) ; calcium ions ; AVP ; e.g. equilibration time	[max 2]	R temperature A 'amount' for concentration A 'amount' for concentration R blood R size of fibrinogen / substrate
			[Total: 13]	

Page 8	Mark Scheme: Teachers' version	Syllabus	Paper
	IGCSE – October/November 2011	0610	32

Question		Expected Answers		Marks	Additional Guidance																																
5	(a)	wings ; beak ; feathers / plumage ; scales on, legs / feet ;		[3]	ignore adjectives such as grey / long / sharp																																
	(b)	(i)	quantitative (feature) ; range between two extremes ; ref. to (many) intermediates ; not in distinct groups ; influenced by the environment (and genotype) ;	[2]	A answer in context of wing length																																
		(ii)	length of anything suitable (body) mass ; age ;	[max 1]	A height R any discontinuous variable, e.g. colour A weight R size / size of A height																																
	(c)	(i)	1 largest number of / most, birds trapped ; 2 oldest (mean age for) birds trapped ; 3 comparative data quote for numbers ; accept fraction / percentage / proportion of total 4 comparative data quote for age ; R 'greater life expectancy'	[max 4]	assume answer is about birds trapped unless stated otherwise <table><tr><td>wing length at ringing / mm</td><td>number of birds trapped</td><td>mean age at trapping / days</td></tr><tr><td>less than 63</td><td>24</td><td>253</td></tr><tr><td>64</td><td>72</td><td>256</td></tr><tr><td>65</td><td>130</td><td>297</td></tr><tr><td>66</td><td>183</td><td>346</td></tr><tr><td>67</td><td>167</td><td>349</td></tr><tr><td>68</td><td>106</td><td>270</td></tr><tr><td>69</td><td>66</td><td>237</td></tr><tr><td>more than 70</td><td>23</td><td>199</td></tr><tr><td></td><td>total = 771</td><td></td></tr></table>			wing length at ringing / mm	number of birds trapped	mean age at trapping / days	less than 63	24	253	64	72	256	65	130	297	66	183	346	67	167	349	68	106	270	69	66	237	more than 70	23	199		total = 771	
wing length at ringing / mm	number of birds trapped	mean age at trapping / days																																			
less than 63	24	253																																			
64	72	256																																			
65	130	297																																			
66	183	346																																			
67	167	349																																			
68	106	270																																			
69	66	237																																			
more than 70	23	199																																			
	total = 771																																				

Page 9	Mark Scheme: Teachers' version	Syllabus	Paper
	IGCSE – October/November 2011	0610	32

Question			Expected Answers	Marks	Additional Guidance
		(ii)	1 number of young birds of each wing length ; 2 wing lengths of birds that died ; 3 length of life / length of life after trapping ; 4 results for birds in West Africa ; 5 effects of migration ; 6 wing lengths of birds that breed ; 7 number of times each bird is trapped ; 8 effect of trapping on behaviour ; 9 larger sample ; 10 other locations in, Sweden / anywhere in Europe ; 11 AVP ; 12 AVP ;	[max 3]	<i>look for types of evidence, not assertions</i> R wing length of newly hatched birds R 'study should be repeated' e.g. number of eggs laid by birds of each wing length / test which birds fly furthest / test which birds best at catching food
		(d)	birds with wing length 66–67, survive / live longer ; breed / reproduce / have offspring ; pass on their allele(s) for wing length ; birds with smaller and larger wings, die ; do not reproduce (as successfully) ;	[max 4]	A gene(s) <i>wing length may be implied</i> A 'the others'
				[Total: 17]	

Page 10	Mark Scheme: Teachers' version	Syllabus	Paper
	IGCSE – October/November 2011	0610	32

Question	Expected Answers	Marks	Additional Guidance
6	(a) amylase ; prote(in)ase ; lipase ;	[3]	R carbohydrase R trypsin / pepsin / peptidase R 'protase', A 'proteas'
	(b) 1 prevents spread of (named) disease / AW ora ; 2 avoids pollution / removes harmful substances ; 3 makes, water / sewage / effluent, safe / AW ; 4 avoids smells ; 5 recycling of water ; 6 AVP ; e.g. ref. to eutrophication	[max 1]	A removes harmful microbes / bacteria R 'germs' A examples no need to specify for whom or what it is safe, but R 'safer' unqualified, treat 'marine organisms' as 'aquatic'
	(c) 1 mixes microorganisms with sewage ; 2 good contact between microorganisms and solids ; 3 more collisions ; 4 (aerobic) respiration ; R if anaerobic respiration 5 microorganisms produce carbon dioxide ; 6 gain / release / transfer, energy ; 7 (for) growth ; 8 (for) reproduction ; 9 to make enzymes ; A ref. to digestion	[max 4]	A microbes / bacteria
	(d) to start the breakdown of the sewage quickly ; continuous process ; do not have to, breed / buy, the microorganisms ; <i>idea of</i> without waiting for the lag phase ;	[max 3]	A 'the right organisms to digest the sewage' A ref. to cost / less wastage of microbes A keeps the population of microbes constant <i>idea</i> R 'to save time' unqualified R 'to use over and over again'
	(e) destroys / kills, bacteria / microorganisms ; prevents spread of, disease / pathogens ; makes water suitable for drinking ;	[max 2]	R disinfection R 'removes bacteria'
		[Total: 13]	