CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the October/November 2013 series

0610 BIOLOGY

0610/23 (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 2013 series for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level components.

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Mark schemes will use these abbreviations

- ; separates marking points
- / alternatives
- **R** reject
- **A** accept (for answers correctly cued by the question)
- **I** ignore as irrelevant
- **ecf** error carried forward
- **AW** alternative wording (where responses vary more than usual)
- **AVP**alternative valid point
- underline actual word given must be used by candidate (grammatical variants excepted)
- ( ) the word / phrase in brackets is not required but sets the context
- **D, L, T, Q** quality of: drawing / labelling / table / detail as indicated
- maxindicates the maximum number of marks

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Question	Answer	Marks	Guidance for Examiners
1	respiration; sensitivity; movement; excretion;	[4]	
		[Total: 4]	
2 (a) (i)	photosynthesis;	[1]	
(ii)	18.00h / 6.00 pm;	[1]	**A** – 17.00 – 18.00h / 5.00 – 6.00pm
(iii)	1 photosynthesis needs light; 2 the removal of carbon dioxide stops / amount of photosynthesis falls / amount of carbon dioxide rises, earlier in the day / not as suddenly;	[2]	1**A** – photosynthesis stopped at 18.00 when it got dark
(b)	temperature; availability of water; addition of fertiliser / nutrient / mineral;	**max [2]**	**A** – pH
(c) (i)	may lead to obesity / AW; may cause dental decay / AW; may increase risk of (type 2) diabetes;	**max [2]**	**R** – causes diabetes
(ii)	prevent scurvy / prevent teeth becoming loose / prevent gum damage bleeding / AW;	[1]	
		[Total: 9]	
3 (a)	biceps: **E;** triceps: **A;**	[2]	
(b)	**A;**	[1]	

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(c)	two muscles which have opposite effects / OWTTE;	[1]	
		[Total: 4]	
4 (a) (i)	They are haploid / have half the normal number of chromosomes / have 23 chromosomes / AW;	[1]	
(ii)	sperm has (long) tail / is smaller / ORA; sperm must swim to egg; sperm might contain X or Y chromosome; sperm determines sex / gender of offspring; egg is larger; egg stores nutrients;	[2]	Need a difference with explanation for 2 marks **A** – other sensible alternatives
(b) (i)	fertilisation;	[1]	
(ii)	zygote;	[1]	
(c) (i)	the testis / testicle;	[1]	**A** – plural
(ii)	1 passes along sperm duct / vas deferens; 2 passes along urethra and expelled from penis into vagina; 3 swims past / through the cervix; 4 swims up / through the uterus; 5 along / into oviduct / fallopian tube;	max [3]	3 **A** – from vagina to uterus

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(d)	fetus: calcium; for bone / tooth growth; young child: carbohydrate; for energy for movement / growth; girl at puberty: iron; for blood replacement following menstruation / to make haemoglobin;	[6]	
		[Total: 15]	
5 (a)	constipation; starvation; coronary heart disease / obesity;	[3]	
(b)	1 (increase) use of fertilisers; 2 (increase) use of pesticides; 3 develop varieties with higher yield; 4 use modern machinery; 5 improve availability of water / irrigation; AVP;	[2]	3 **A** – artificial selection / genetic engineering
		[Total: 5]	
6 (a) (i)	liver;	[1]	
(ii)	in the bloodstream;	[1]	
(b) (i)	16 (years);	[1]	
(ii)	increases reaction time / reduces reaction speed; affects judgement (e.g. of distance); may cause sleepiness; may cause aggression; reduces inhibitions;	max [2]	

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(c)	development of addiction / dependency; poor judgement of behaviour; theft of money for alcohol; poor ability to work / AW; family breakdown;	max [3]	
		[Total: 8]	
7 (a) (i)	mahogany tree;	[1]	
(ii)	warbler / tanager;	[1]	
(iii)	appropriate example, but MUST begin with mahogany tree AND end with hawk owl;	[2]	2 organisms in correct order – 1 mark 4 organisms in correct order – 2 marks
(iv)	flow of energy along the food chain / from organism to organism;	[1]	**A** energy transfer
(b)	less choice of food for owl; so owl consumes more tanagers and mice;	[2]	AVP
(c) (i)	100 9 2;	[1]	**all** 3 must be correct
(ii)	2nd, 3rd and 4th levels in correct position; mahogany tree shown at base of pyramid;	[2]	
(d)	mass / dry mass / weight of each type of organism / AW;	[1]	
		[Total: 11]	
8 (a)	**P –** rainfall; **Q –** evaporation; **R –** transpiration; **S –** drainage;	[4]	**A –** evaporation

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(b) (i)	in sweat / sweating; in urine / urinating; in tears / crying; in faeces / defaecating / egesting; on breath;	max [2]	**I** – ref. to urea **I** – ref. to excretion unqualified
(ii)	animal eats / digests plant; releases water from plant cells; absorbs water across gut / colon wall / into blood; correct ref. to osmosis / diffusion; transports water in bloodstream / to cells;	max [3]	**A** – transpiration by plant and then relevant stages of water cycle leading to animal drinking
(c) (i)	shoot 1	[1]	
(ii)	the number / size / surface area (of leaves) on shoot 1 may be greater;	[1]	ecf – shoot number from (c)(i)
(iii)	air bubble moved more slowly in **D** because air is humid; air cannot accept so much water vapour / less steep concentration gradient;	[2]	**A** - ORA
		[Total: 13]	
9 (a)	1 select / choose plants with desired characteristics; 2 pollen from anthers / stamens of one variety; 3 onto stigma of second variety; 4 collect seeds; 5 grow seeds and observe properties;	max [3]	If neither 2 or 3 gained then allow 1 mark for – cross pollination between two varieties
(b) (i)	a length of DNA (that codes for a specific protein);	[1]	
(ii)	nucleus;	[1]	
(c)	mutation;	[1]	

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(d)	Super Plus; Lo-Cost;	[2]	
(e)	New Mocha; Gro-Better;	[2]	
(f)	New Mocha;	[1]	
		[Total: 11]	

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