CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the May/June 2013 series

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 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 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
- **ORA** or reverse argument
- **OWTTE** or words to that effect
- 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
- max indicates the maximum number of marks

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<table>
<tr><th></th><th>Answer</th><th>Marks</th><th>Guidance for Examiners</th></tr>
<tr><td>1 (a)</td><td>
<table>
<tr><td></td><td>monocotyledons</td><td>eudicotyledons</td></tr>
<tr><td>number of cotyledons in seed</td><td>1;</td><td>2;</td></tr>
<tr><td>pattern of veins in leaf</td><td>parallel veins;</td><td>network of veins/branching veins;</td></tr>
<tr><td>number of flower parts e.g. petals</td><td>3/6;</td><td>5/4;</td></tr>
</table>
</td><td>[max 4]</td><td>Each correct response 1 mark.</td></tr>
<tr><td>(b)</td><td>1 light;
2 gravity;</td><td>[2]</td><td>1 and 2 A – water/moisture/humidity, temperature/heat, wind, touch</td></tr>
<tr><td>(c) (i)</td><td>root;</td><td>[1]</td><td></td></tr>
<tr><td>(ii)</td><td>xylem correctly labelled;
phloem correctly labelled;</td><td>[2]</td><td>Label lines must be clear</td></tr>
<tr><td>(iii)</td><td>support;
transport of water;
transport of minerals/salts/ions;</td><td>[max 2]</td><td>A – named example
I – nutrients
Any two – 1 mark each.</td></tr>
<tr><td></td><td></td><td>[Total: 11]</td><td></td></tr>
</table>

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2 (a)	*agricultural machinery* 1. tractors allow deeper ploughing/OWTTE; 2. allows better drainage/aeration of soil/OWTTE; 3. other machinery allows better/quicker sowing of seeds/OWTTE; 4. less wastage of seeds/cost saving/OWTTE; 5. better/quicker harvesting systems/OWTTE; 6. ref to irrigation/spreading of fertilisers/pesticides/OWTTE; 7. greater area under cultivation/OWTTE; 8. less labour intensive/OWTTE; 9. larger/heavier crop (per unit area)/OWTTE; *fertilisers* 1. supply minerals/nutrients; 2. e.g. nitrates/magnesium/phosphates/potassium; 3. (nitrates) for protein/amino acid formation; 4. (magnesium) for chlorophyll formation; 5. these allow increased/faster growth/photosynthesis; 6. allows use of poorer soils/OWTTE; 7. larger/heavier crop (per unit area);	[max 6]	Allow any **four** responses in either section up to a **MAX** of 6 marks total. **A** – nutrients **Beware** responses that confuse fertilisers with insecticides **A** – responses in terms of hydroponics, green houses **A** – any other named mineral, (soil) nitrogen **A** – other correct roles for a named mineral **A** – other correct roles for a named mineral **A** – any other valid point e.g. means a fallow year not needed Any six – 1 mark each**.**
		[Total: 6]	

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3 (a) (i)	(a zygote is formed) by male gamete/sperm and female gamete/ovum; (two gametes) fuse/fertilises/joins/combine;	[2]	**A** – egg **A** – sperm enters ovum
(ii)	zygote divides/undergoes mitosis/forms a ball of cells; then implants in uterus/OWTTE;	[2]	**A** – cell division
(b) (i)	mother's and fetal blood can be of different blood groups; bloods are at different pressures/high pressure of mother's blood would damage fetal vessels; no direct transfer of drugs/toxins; no direct transfer of pathogens/bacteria;	[max 1]	**A** – blood types **A** – poisons **A** – disease in mother's blood Any one – 1 mark.
(ii)	*small intestine* allows transfer/absorption/diffusion of nutrients; from mother/into fetus; of glucose/amino acids/minerals/vitamins; *lungs* allows transfer of oxygen; from mother/to fetus; allows transfer of carbon dioxide; from fetus/to mother; *kidney* allows transfer of urea; other waste (chemicals); from fetus / to mother;	[max 6]	**A** – embryo/baby for fetus throughout Only credit direction of transfer points if referring to correct gas **A** – allows gaseous exchange; between mother and fetus; if no other points gained **R** – faeces or other egested matter Any six – 1 mark each

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(c)	by not smoking; not drinking alcohol; not taking non-medicinal drugs/OWTTE; avoiding infections / OWTTE; having a balanced/healthy diet/OWTTE; (gentle) exercise; (regular) check-ups/keeping a check on blood pressure;	[max 2]	**A** – reducing caffeine intake **A** – folic acid/calcium/vitamins/protein supplement Any two – 1 mark each**.**
		[Total: 13]	

4 (a)	1. forms acid rain; 2. causes erosion of buildings/limestone/OWTTE; 3. makes lakes/rivers acidic; 4. kills fish/aquatic animals; 5. kills/damages trees/leaves/lichens; 6. affects/irritates airways/lungs/eyes/throat; 7. leading to asthma/bronchitis; 8. can lead to formation of smog/haze;	[max 3]	**A** – kills/damages living organisms if neither MP4 or 5 awarded **A** – any other valid point. Any three – 1 mark each**.**
(b) (i)	K;	[1]	
(ii)	K **and** L;	[1]	Need both for mark.
(iii)	M; It is unable to withstand high concentrations of sulfur dioxide/can only survive when sulfur dioxide becomes diluted/ unable to grow within 7 km of site/ORA;	[2]	
(iv)	extraction of figures (10 + 15 + 20); = total 45;	[2]	**A** – ecf for total if extracted figures are shown.
		[Total: 9]	

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5 (a) (i)	lipase;	[1]	
(ii)	glycerol;	[1]	**A** – triglycerol
(iii)	fatty acids have a low pH/acids are produced;	[1]	
(b) (i)	any 3 points plotted accurately; other 3 points plotted accurately; points joined by line;	[3]	accurate to ± 2 mm (1 square) ditto **A** – curve or joined point to point **I** – extrapolation except linking back to 0,0
(ii)	award as per candidate's graph;	[1]	likely to be in region of 34–36
(c) (i)	bile (salts) emulsify fats/oil/OWTTE; increases surface area; allows more contact with enzyme/lipase; bile (salts) speed up digestion of fats	[3]	Any three – 1 mark each.
(ii)	the reaction would happen faster/the indicator would turn yellow in a shorter time; the optimum would be at the same temperature;	[2]	**A** – ecf from (b)(ii)
		[Total: 12]	

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6	enzymes/temperature increase/suitable pH; anaerobic; ethanol/alcohol; baking/brewing/wine making; glucose; lactic acid;	[6]	**A** – catalysts **A** – fermentation **A** – sugar / correctly named sugar
		[Total: 6]	

7 (a) (i)	ovary wall;	[1]	**A** – ovary, pistil, gynoecium
(ii)	1. having a bright/attractive colour; 2. having a fleshy/edible/tasty (outer) region; 3. having attractive smell; 4. having hooks; 5. seed (coat) resistant to digestion/OWTTE;	[max 3]	Any three – 1 mark each. **A** – ref to adhering to animals
(iii)	wind/water/explosive mechanisms;	[1]	**A** – mechanisms
(b)	1. insects can carry pollen; 2. from flower to flower/anthers/male parts to stigma/female parts;	[2]	**A** – ref to pollination for 1 mark if neither of MPs 1 and 2 gained. **A** – from plant to plant
		[Total: 7]	

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8 (a)	carnivore; herbivore; producer;	[3]	
(b) (i)	10 000 (kJ);	[1]	**A** – if on diagram
(ii)	photosynthesis;	[1]	
(iii)	1. respiration; 2. heat / radiation/convection; 3. excretion ; 4. egestion; 5. movement; 6. not all of organism is eaten;	[max 2]	**A** – identified movement activities e.g. hunting, running Any two – 1 mark each.
		[Total: 7]	

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9	(a)	1. less in (renal) vein/ORA; 2. (kidney) removes/excretes/filters urea; 3. from blood (plasma); 4. in capillaries/glomerulus; 5. not all removed/not reabsorbed;	[max 3]	**A** – drop in urea concentration Any three – 1 mark each.
	(b)	1. fall in oxygen concentration; 2. rise in carbon dioxide concentration; 3. respiration (in kidney); 4. aerobic; 5. oxygen used up (from blood); 6. carbon dioxide produced/added (to blood);	[max 3]	**I** – refs to the blood vessels Any three – 1 mark each.
	(c)	1. drop in glucose concentration; 2. kidney removes/filters glucose; 3. then concentration rises; 4. as glucose is reabsorbed (into blood); 5. none lost in urine; 6. final concentration lower than original/OWTTE; 7. as some is used in respiration/for energy;	[max 3]	**A** – accept ref to some in urine of diabetics Any three – 1 mark each.
			[Total: 9]	

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