UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the October/November 2010 question paper for the guidance of teachers

0610 BIOLOGY

0610/62 Paper 6 (Alternative to Practical), maximum raw mark 40

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.

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Questions	Mark Scheme		Guidance/comments
1 (a)	unripe fruit – smaller / seeds white freshly harvested – larger / seeds getting darker stored, ripe fruit – wrinkled /darker in skin colour/ seeds darker;;;	[max 3]	

	small	middle	large
number of seeds	1	1	3 / more
colour of seeds	white	white	dark / black
size of seeds / maturity	small / immature / under-developed	larger / more mature / developed	larger / mature / developed
core / middle region / aw	undeveloped	developing	developed / larger
sepal / stigma / style / flower remains	present	less clear	smaller / shrivelled / aw
fleshly wall / mesocarp	thin	developing	thicker
skin / epicarp / outer layer	outer covering of young fruit / aw	thin / pale	thicker / darker

I. ref to petals/anthers

A. relevant comment not linked to a particular stage.

I. comments on roots / leaves / stalk / cell wall.
I. seeds – growing as confused with germination.
I. comment on size of apple as instructed in question.

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(b)	**one safety feature** – max; starch iodine solution; black if starch present; reducing sugar make solution / AW; add Benedict's solution; heat; green / yellow / orange / red; [int max 3]	[max 5]	Water bath / tongs / lab coat / hair tied back. **I**. gloves. **A**. drops of iodine / iodine in KI. **A**. black / purple / blue **I**. heating / ethanol. **A**. make an extract / chopping up and adding water / AW **A**. Fehlings / Clinistix. **I**. warm Must match reagent used. Clinistix purple / dark blue for positive. **I**. brown alone. **A**. red / reddish brown. **I**. use of ethanol. If used biuret reagent – do not award marks for reducing sugar.
(c) (i)	66.3 93.5 109.5	[1]	All correct = 1 If 30.5 / 27.2 / 16.0 – no mark but e.c.f. for plot.
(ii)	**A** – axes and labels and orientation; **S** – scale – suitable to fill more than half the grid and even; **P** – plot; **L** – line; Score marks by a series of √ or X in order.	[4]	*x*-axis – time in days and *y*-axis – loss in mass (of apples) / g If plot mass – 2nd column in error Allow S and L 2 MAX. Non-linear scale A only. Allow +/– half a small square. Must plot zero. For those who plot only the last 3 values: Allow A, S and L = 3 max. Allow line of best fit – if correct and balanced plots each side of the line. Allow a smooth curve but not if 'sagging' and too thick to identify points. Allow points joined by ruled lines. No extrapolation. Histograms / bar charts allow A, P and neatness = 3 max. Allow label for columns in the middle not to one side.

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(iii)	respiration / fermentation / oxidation; transpiration / evaporation / dehydration / water loss / drying; decomposition / decay / action of microbes / rotting / AW;	[max 2]	Allow aerobic and anaerobic respiration. **A**. excretion of CO_2 **I**. reduction / metabolic reactions/ / hydrolysis. **I**. eating / osmosis.
(iv)	1. keep in cooler conditions / in a fridge / not too hot / AW ; 2. cover apples / wrap apples; 3. keep in the dark or out of sunlight; 4. under different gases / nitrogen / carbon dioxide/ less oxygen / air tight / vacuum; 5. keep separated / cushioned / AW; 6. keep away / separated from ripe fruits;	[max 3]	**R**. freezer **R**. use of plastic bags / cellophane / clingfilm. **A**. paper / foil. Idea to prevent bruising. **I**. moist or dry conditions / well ventilated / wash and disinfect / pesticides / preservative / antioxidants.
	[Total: 18]		

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2 (a)	drawing: **O** clear outline and no heavy shading; **S** equal size but not smaller than 6 cm; **D** both valves and hinge; **ONE** label: hinge / joint / ligament / shell / exoskeleton / muscle attachment / AW;	[4]	Allow stippling but not blocked in shading **I**. thick wall / covering / coat / epidermis / testa / outer layer. Score marks by a series of √ or X in order for drawing but tick by correct / accepted label.
(b)	protective / camouflage / shelter / safety /hide; hard / tough/ rigid / thick / heavy; from predators / being eaten / attacked / prevent drying out / pressure or waves or depth of water / current;	[max 2]	**A**. if this is implied
(c) (i) **(ii)**	<u>mollusc</u>; size in Fig. 2.2 ……38…(.mm); *NB length.* scale is 3 mm = 25 mm – part of working; actual size = $\frac{38 \times 3}{25}$ = 4.56 mm or 0.456 cm; 4.6	[1] [3]	**A**. close spelling **A**. +/– 1 mm for length 37 – 41 mm From diagram check if width has been measured in error. ecf. Accept correct word formula = one mark Accept actual size in range of 4.4 – 4.8 mm Allow correct measurement in cm. If correct answer – but no working shown √√ = 2
		[Total: 10]	

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3 (a)

feature	submerged leaves	floating leaves
shape	thin / narrow / elongated / divided / branched / ORA	broad / entire / undivided / ORA
surface area	small	large
number	2 / less / fewer	3 / more
leaf stalk / petiole	not present / leaf attached	present / long
veins	none / not visible	present / network

[max 2]

Descriptions appear either in table form or all text and run together – dredge.
They / it = submerged leaves.
I. reference to flowers.
Answer does not have to be comparative. **A**. description of one type of leaf.

Award correct biology.

(b) (i) palisade mesophyll;
spongy mesophyll; label lines or brackets

[2]

Row of cells below the upper epidermis to top of air spaces.
Exclude the lower epidermis but from boundary of large air spaces. Do not accept vascular bundle in the centre.
Label lines can be to one cell or to an air space rather than a bracket. Check the names are not inverted.
Independent label marks

(ii) palisade mesophyll: more light/ more or lots of chloroplasts / more chlorophyll;
arrangement of cells near upper surface;
photosynthesis;

spongy mesophyll : air spaces / air gaps;
less light/ less chloroplasts / less chlorophyll;
photosynthesis:
gas / CO_2 / water vapour / oxygen / air circulation / gas exchange;

[max 3]

A. 'middle tissue' as spongy mesophyll.
Photosynthesis only once
Not separated by naming the tissue – then **A**. correct references to photosynthesis / gas exchange / air spaces for MAX 2
I. reference to vascular tissue.

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(c)	animal tube: colour – <u>yellow</u>; explanation – giving off / producing / releasing CO_2 / high CO_2 / carbonic acid; from respiration; waterweed tube: colour – <u>purple</u>; explanation – low CO_2 / CO_2 used up / taken in / AW; by photosynthesis;	[max 5]	Read the whole answer – the colour may change during the answer to final colour at the end of account. Independent marking. **I**. becomes acid. **I**. any references to oxygen. **I**. references to breathing. Not red for colour but allow explanation if ref to photosynthesis. **I**. any references to oxygen and change in pH / becomes alkaline.
		[Total: 12]	

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