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

0610/53 Paper 5 (Practical Test), 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.

Mark schemes must be read in conjunction with the question papers and the report on the examination.

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Question	Mark Scheme	Mark allocation	Guidance
1 (a)	Drawing: – clear outline of **whole** fruit, no shading; – size 10 cm or more; – thickness of outer wall shown; – attachment of seeds / pattern / compartments; **ONE** label: fruit wall / pericarp / epicarp / mesocarp / pulp / pith / skin / flesh / placenta / endocarp [if correct];	[5]	4 drawing marks. Check Supervisor's report. Ignore the boundary around the seed area as not distinct. No shading anywhere. Just for the outer line of the whole fruit – with or without the stem. Lines to show the pale epicarp – should follow the 'contour' of the outside wall and be evenly spaced. Mark with a tick in order. Fruit wall is the whole thickness = pericarp that is composed of epicarp [actual outer layer] + mesocarp [pulp] + endocarp [paler layer around the seed cavity]. Ignore if line for fruit wall is to epicarp only. Accept exocarp [language].
(b)	**shape:** oval / flat / AW; **colour;** **texture:** hard / soft / slimy / AW; **edges:** ridges / smooth surface / AW;	[Max 2]	
(c) (i)	Extract from the tissue / grinding / crush seeds / AW; ONCE **fat** (emulsion test): add alcohol / ethanol / fat solvent / AW; add water; **starch**: add iodine **solution;**	[4]	First mark applicable for **either** test **ONCE.** Take a sample / take a piece of seed – insufficient. Need solvent to be added before the water. Grease spot test – one mark only. Accept iodine in potassium iodide, drops of iodine, Need starting colour as well as final colour.
(ii)	Colour change – fat; starch; Conclusion – fat; starch;	[4]	Refer to candidates answer for **(c)(i).** Conclusion needs to agree with observations.

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(d) (i)	**Two** labels from: cotyledon, plumule, radicle, hypocotyl, root hairs;;	[Max 2]	plumule = above soil level to the cotyledons. Accept phonetic spellings. radicle = below soil level. Accept phonetic spellings. hypocotyl = 0.5 cm +/– either side of the soil line on Fig. 1.3. Ignore shoot, root and other incorrect labels.
(ii)	medium to grow such as soil / cotton wool / blotting paper / paper; warm temperature / warmth / suitable specified temperature e.g. 15 to 30° C; water / moisture /damp / rain / humid / wet / pre-soaking; oxygen / aerobic conditions; AVP – scraping seed coat to break dormancy / cold period e.g. vernalisation / fire for pyrophytes;	[Max 3]	Ignore addition of fertilizers, minerals, etc. Ignore temperature alone / optimum temperature / heat unqualified / sun / good temperature unqualified / room temperature [might be freezing!]. Accept not too hot **and** too cold = warmth. Accept not too humid **and** not too dry = damp. Both sides of the answer required for mark. Ignore air / carbon dioxide. Ignore references to light / pH / photosynthesis / time / mineral salts / auxins.
		[Total: 20]	
2 (a) (i)	in salt solution – less than 60(mm); value subtracted from 60mm;	[2]	If 5.2 without cm – no mark. Minus sign required or word description.
(ii)	**appearance** – wrinkled / smooth / thin / slimy ONCE / shiny / colour ONCE; **texture**: shorter / shrunken / wrinkled / soft / bendy / slippery / flexible / flaccid / slippery ONCE / slimy ONCE;	[2]	
(b) (i)	in distilled water – more than 60(mm); value in excess of 60 mm;	[2]	If units wrong – 1 mark for **(a)(ii)** or **(b)(ii)**.
(ii)	**appearance –** colour ONCE / rough / thicker; **texture:** solid / turgid / smooth / firm / hard;	[2]	

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(c)	<u>Osmosis / diffusion of water;</u> Reference to partially / semi- / selectively permeable membrane**;** *In salt solution:* Movement of water from chip / AW**;** Correct gradient – however expressed**;** *In distilled water:* Movement of water into chip / AW**;** Correct gradient – however expressed**;**	[Max 4]	Osmosis in previous question **(i)** check previous answers to **2(a)** and **2(b)**, ecf. Gradient can be given in terms of water potential / concentration or availability of water
(d) (i)	(–)9.66 or 9.65%**;**	[1]	Accept 9.65517 or 9.7 rounded to 1 d.p. or 9.66 rounded up to 2 d.p. or 9.65% rounded down to 2 d.p. or to 9.655 to 3 d.p. Ignore rounding up to nearest whole number.
(ii)	Difference in starting mass / the mass did not start the same / AW**;**	[1]	Ignore for fair test, more accurate.
(iii)	**S –** scale**;** **P –** plot**;;** **L –** smooth curve to join plots / line joining plots**;**	[4]	Bar chart – **S, P;; max 3.** Even scale spaced across the grid so the curve fills half more than half for both 'x' and 'y' axes. Accept scale on lower edge of grid for 'x' axis. See example C. Accurate to one small square on grid. Accept ecf. **2 (b)(i).** Plot marks – one error –1 mark, 2 errors no marks for plotting. **Reject** large points that cover more than one small square. If scale is inverted – negative values above and positive below, allow **S**, **P** and **L** to max 3.
(e) (i)	point where line crosses the 'x' axis – to fit graph in **2(d)(iii)**;	[1]	.
(ii)	No net change / water entering = water leaving / Ψ inside and outside the same / concentration is equal / isotonic / state of equilibrium**;**	[1]	Ignore 'no water movement', no osmosis, no diffusion, no water uptake or loss [not the idea of equal].
		[Total: 20]	

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