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

0610/63 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) (i)	**A** 35 cm^3 and **B** 42 cm^3;	[2]	Both readings exact – no deviation. ecf for plotting
(ii)	**A –** axes orientation and labels; **S –** suitable and even scale; **P –** plot; **L –** line; **K –** key;	[5]	'*x*' time / minutes – minimum t / min '*y*' volume of dough / cm^3 – minimum v / cm^3 . A. ml Even and fill ½ or more of grid. Lines to be judged. Points +/– ½ square. All correct. Two lines – smooth curve, point to point ruled. No extrapolation. Label on line or separate. 2 separate graphs – max 4 – no mark for key. Non-linear scales – **A**, **K** only – max 2. Histogram / bar chart – **A**, **P**, and neatness of columns = max 3.
(iii)	both sets of dough rise; **B** rises more; **B** contains the flour improver; credit for use of appropriate numbers for trend; increasing steadily / smoothly;	[max 3]	**B** rises faster than **A** = 2. volume = dough if not specified Rate of increase in **B** is higher than **A** = 2 Calculation of % or a difference. (need to extend idea further – % need not be correct maths) Positive correlation, steady rise. Allow for **A** or **B** or both.
(iv)	same apparatus / measuring cylinders – glass or plastic; two people to mix dough at same time / AW; same mass of sugar / yeast / flour / water / dough / ingredients; same type of yeast / sugar; same temperature / pH; technique to get dough into the measuring cylinder / uneven surface of dough as rises – use paper disk / AW; replicates; AVP;	[max 4]	Same amount – allow. Not volume except for water / dough. Same conditions – max 1. allow room temperature / protect from draughts / control temperature. Ignore – use of lids. Practical idea on a possible method. Ignore – time more often / use of timer / do it for longer. Ignore use of control / reference to parallax when taking reading.

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(b)	respiration / fermentation; anaerobic; CO_2 (Production / giving off); pockets of gas trapped in dough;	[max 2]	*Ignore reference to oxygen* CO_2 causes the dough to rise = 2. Gas / air causes dough to rise = 1. Equation for respiration = 2.
(c) (i)	asexual / budding / binary fission;	[1]	Allow mitotic cell division. Allow mitosis. Ignore ref. to spores.
(ii)	measurement of cell **X** in mm;	[1]	Check the drawn line. (ecf for **(iii)**.) If bud and cell = 153 (mm) +/– 1 mm. allow 15.3 cm Cell = 103 mm +/– 2 mm. Accept 10.3 cm Accept with line width 81 mm and length in larger cell to demarcation in cytoplasm. Units mm / cm / μm. No line + measurement outside range above – cannot gain mark. ecf
(iii)	*calculation* $\frac{\text{measurement in } \textbf{(ii)}}{5000}$; actual length;;	[2]	Based on the measurement given in **(ii)** ecf Allow word equation: $\frac{\text{drawing / diagram}}{\text{magnification}} = \text{actual size}$ If cell 0.021 mm (covers range allowed) If cell + bud 0.031 mm If width 0.016 mm
		[Total: 20]	

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2 (a) (i)	**Drawing**: **O** clear outline and no shading; **D** leaflets and tendrils; **Labels; 2** from: tendrils / midrib / vein / lamina / leaf blade / leaflet / leaf stem / stem / stalk;;	[4]	If only one leaflet drawn allow **O** mark. 2 or more leaflets plus tendril for **D** mark. **Accept labels on Fig. 2.1**. Ignore label 'leaf' as in question. Ignore cuticle / epidermis / chloroplasts / vascular bundle / AW. If drawn an atypical leaf – accept label marks.
(ii)	large surface area / broad / spread out / non-overlapping; absorb light; absorption of carbon dioxide; photosynthesis; veins / network for transport / support; correct material transported; tendril / or description; attachment / climbing / support / reach higher levels / more light / AW;	[max 3]	AW for absorption of light / capture / collect / trap light. Not attract light. Ignore 'stalk' alone for supporting leaf. Ignore reference to water running off leaf because of shape.

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(b) (i)	water **and** warmth **and** oxygen / air;	[1]	Accept chemical symbols. Ignore light / dark. Accept – humidity / damp for water / moist. Accept – heat / suitable temperature. R. carbon dioxide alone.
(ii)	water; warmth; in soil – plant out; fertiliser / minerals / nutrients; suitable pH; longer time period – weeks; light / sun (for photosynthesis); space for growth; support to climb; protect from pests / animals / disease; weed;	[max 3]	Ignore humidity. Accept moist soil = 2 Ignore germination details. Allow water and warmth. Rich soil = 1. not acid soil – ignore not 'bright'. Ignore expose to oxygen / carbon dioxide. Ignore – temperate climate. Allow spray with insecticides.
(c)	1. average; 2. correct; 3. variation / description / range given; 4. reason – not enough light / effect of environment / overcrowding / AW; 5. arranging into groups; 6. more tall plants than dwarf; 7. 15 tall : 9 short; 8. description / explanation of the groups; 9. expression of a standard ratio; 10. variation linked to genetics. 11. continuous variation within group / discontinuous variation between groups; 12. AVP e.g. different species / varieties of pea;	[max 4]	37.36 cm – allow one for calculating an average even if incorrect calculation. If correct average 36–38.5 cm = 2 marks. Range 11.0 to 64.0cm. Ignore idea of planting on different days / length of flowering. Can be shown by tally chart or graph. Recognised a pattern or gap in heights. 2 : 1 idea.
		[Total: 15]	

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3			Ignore long and thin – all three are. Accept head and tails are different. Head = different ends = 1. Head end not visible on Fig. 3.1. Ignore bumpy / rough. Accept recognisable spellings. Ignore snake / vertebrate / chordate. Ignore curled up. Allow large scale BOD.

	group	reason
D	*nematode*;	not segmented / featureless / smooth / anterior end / different ends / small / short / AW;
E	annelid;	segmented / rings around body / different region – saddle / clitellum / size / AW;
F	reptile;	scales / tongue / eye / size / head / AW;

[5]

[Total: 5]

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