UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the October/November 2010 question paper

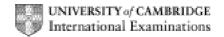# for the guidance of teachers

0610 BIOLOGY

0610/63 Paper 6 (Alternative to Practical), maximum raw mark 40

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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.

(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* $\dfrac{\text{measurement in (ii)}}{5000}$; actual length;; [2]		Based on the measurement given in **(ii)** ecf Allow word equation: $\dfrac{\text{drawing / diagram}}{\text{magnification}} = \text{actual size}$ If cell $\quad$ 0.021 mm (covers range allowed) If cell + bud $\quad$ 0.031 mm If width $\quad$ 0.016 mm
	[Total: 20]		

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;;		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.
				[4]	
		(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]		

3		group	reason		Ignore long and thin – all three are. Accept head and tails are different. Head = different ends = 1.
	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;		Head end not visible on Fig. 3.1. Ignore bumpy / rough. Accept recognisable spellings.
	F	reptile;	scales / tongue / eye / size / head / AW;		Ignore snake / vertebrate / chordate. Ignore curled up.
				[5]	Allow large scale BOD.
			[Total: 5]		