CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the October/November 2012 series

0610 BIOLOGY

0610/51 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 should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

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Question	Mark scheme		Guidance **A** = accept **R** = reject **I** = ignore **AW** = alternative wording to convey the same meaning
1 (a)	three results in **W1**; three results in **W2**; **W1** lower number bubbles than **W2**/ORA**;** Gradual decrease in number of bubbles in **W1/W2;**	[4]	(W1 has less sugar CHECK SUPERVISORS REPORT)
(b) (i)	respiration / fermentation;	[1]	**I**. – aerobic or anaerobic. Ignore excretion.
(ii)	carbon dioxide;	[1]	**A.** chemical formula if correct.
(iii)	limewater; cloudy / milky / AW ;	[2]	**A.** ecf If test matches gas named in (ii) **I.** cloudy if used with emulsion / ethanol test **A.** hydrogen carbonate / bicarbonate indicator to yellow **I.** pH indicator
(c)	temperature control / avoid temperature fluctuation / to keep them at same temperature / AW; (warm water) increase in rate of reaction / activates yeast / increases respiration / AW ; correct reference to enzyme activity;	[max 2]	**I.** need warmth to produce bubbles **A.** ref. to increased collisions **I.** denaturation **I.** optimum

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(d)		[max 3]	A. ecf from 1(a) **Explanation must link to correct description** **A**. reverse argument **I.** reference to presence / absence of bung

Description	**Explanation**
W1 lower number bubbles than **W2** / AW;	Less yeast in **W1** / **W2** has been (reacting) in warm water longer / AW;
No: bubbles decrease from trial 1 to trial 2 and /or trial 3 (for **W1** and /or **W2** / AW;	Sugar / substrate decreasing;

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(e)	**Any 2 sources of error and 2 linked suggestions of improvement**. e.g. **Error** : change in temperature / different starting temperatures / different length of time in warm water; **Improvement** : (monitor with thermometer and) add hot / cold water (to keep constant) / use water bath / start testing at same time / AW; **Error** : varying amounts of yeast; **Improvement** : use same mass yeast /AW; **Error** : (inaccurate) timing; **Improvement** : use stop watch / AW; **Error**:(variable)shaking of tube; **Improvement** : shake for same amount of time / at same rate / AW; **Error**: inaccurate counting of bubbles / different sized bubbles; **Improvement** : use gas syringe / data logger / displacement / measuring cylinder / repeat (experiment) ; AVP;	[max 4]	**N.B**. Improvement should be **specific** to an error and refer to an experimental **method**. **Read through each error and improvement together to look for correct answers.** **I.** temperature alone **I.** 'keep at constant temperature' alone **I.** large beaker with exact temperature **A.** two people testing at same time **I.** decrease in sugar concentration **I.** length of time **I.** delivery tube at different depths **A.** do not shake tubes **A.** increase number trials / test tubes **I.** differences in apparatus **I.** pH **I.** controls **I.** average / mean
	[Total: 17]		

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2 (a)	**Drawing:** **O:** outline; **S:** size and proportion; **D:** details; **Label :** one from Lamina / blade / (network of) vein(s) / midrib / petiole or (leaf) stalk / description of margin e.g. serrated or jagged edge;	[4]	**Answers must relate to specimens** **R.** shading **R.** majority of sketched / artistic lines but **I.** minor / isolated overlaps or breaks. **R.** single line for petiole **R.** serrated edge with single line drawn through it Drawing at least half page Minimum – midrib, veins each side of midrib and petiole. **indicate correct label with tick next to it.** **I**. spine. **I.** sharp **I.** stem
(b) (i)	*similarity*: midrib / (network of)veins / petiole / leaf stalk / description of margin / green colour / AW / AVP;	[1]	**Answers must relate to specimens** **I**. size / shape /sharp. Give ECF BOD for incorrect drawing label

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(ii)	2 *differences* from: entire v divided (into leaflets) / simple v compound / AW; leaf v <u>leaflets</u>; pointed tip v rounded tip; AVP;	[max 2]	**Answers must relate to specimens** **Must have a comparative answer.** **A.** into small/er leaves **I.** many / more leaves **I.** size e.g. wider / longer / AW
(iii)	Any one from: Network of veins / midrib / broad leaf / wide blade	[1]	**Must relate to W3** **I.** large
(c) (i)	line to or within palisade cell;	[1]	**A.** any correct indication of palisade cell. **A.** label c(i)
(ii)	start / entry from outside through lower stoma; end on or in labelled cell / c(i) cell;	[2]	**A.** lines drawn Max 1 if no arrows or arrows in wrong direction

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(d) (i)	Any three from: idea of mesophyll cells / blade / lamina / AW decomposed first / veins or midrib remain ; midrib / veins harder or tougher (so remain) / lamina softer or weaker / AW ; by decomposers / bacteria / fungi / microorganisms or detritivores / named examples; digestion / respiration / decay (by decomposers); AVP;	[max 3]	**I.** leaf gets smaller **A.** 'skeleton' of leaf left **A.** eaten by **I.** decomposed (in question) **I.** decolourise **I.** reference to mass
(ii)	**A** – labelling of axes and linear scaling; **S** – size **P** – plot; **L** – line;	[4]	**A.** 'mass / g' as minimum. plots to fill more than half of grid along both axes ± 1.0 mm / ½ small square. Any 1 incorrect = 0 **A.** an accurate curve connecting all points or joined point to point by a ruled line **R.** sagging / bulging lines **R.** extrapolation > 1 small square histogram / bar chart [max 3] **A, S** and **P**. no numbers on axes [max. 2]– **S** and **L**

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(iii)	Increase in mass at start / first 6 months / AW; (Overall or after 6 months) mass decreases; Correct reference to figures;	[3]	**A.** weight **A.** minimum of two mass results with correct units once or a calculated difference.
(iv)	Any two from: temperature / warmth / /hot climate / sunlight / energy / light intensity; moisture / humidity / wet conditions / water; amount of, microorganisms / decomposers / (named) decomposer;	[2]	**I.** environmental conditions / oxygen **A.** tropical conditions = 2 **A.** too many leaves for number of decomposers
		[Total: 23]	

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