CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Ordinary Level

MARK SCHEME for the October/November 2013 series

5090 BIOLOGY

5090/32 Paper 3 (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.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the October/November 2013 series for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level components.

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Mark schemes will use these abbreviations

;	separates marking points
/	alternatives
()	contents of brackets are not required but should be implied
R	reject
A	accept (for answers correctly cued by the question, or guidance for examiners)
Ig	ignore (for incorrect but irrelevant responses)
AW	alternative wording (where responses vary more than usual)
AVP	alternative valid point (where a greater than usual variety of responses is expected)
ORA	or reverse argument
underline	actual word underlined must be used by candidate (grammatical variants excepted)
max	indicates the maximum number of marks that can be given
+	statements on both sides of the + are needed for that mark

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Question	Answer	Mark	Notes
1 (a) (i)	4 numbers recorded;	[2]	3 numbers recorded = 1 mark 2 or fewer = 0 marks
(ii)	bubbles (of any gas) produced in both; more in sucrose / correct usage of numbers / AW / ORA;	[2]	
(b) (i)	carbon dioxide / CO_2;	[1]	
(ii)	lime water; **or** hydrogen carbonate indicator; clear to cloudy / milky; red to yellow;	[2]	**R.** emulsion (w.r.t. lime water)
(iii)	respiration / fermentation;	[1]	
(c) (i)	to prevent yeast settling / for uniform/even distribution of yeast / mixing (qualified) / AW;	[1]	**Ig.** ref. to speed of reaction
(ii)	volume (of solution); concentration / % of sugar in solution; mass / 3 g of yeast; temperature (of the water); timing period (no. counts / repeats between samples); shaking (qualified e.g. degree of shaking); AVP	[max 3]	**R.** warm water alone
(d) (i)	PQ distance at least 60 mm + outline drawn with smooth clear continuous line; good proportions with 'parent' approx. ×2 'bud' in length and joined; nucleus + 1 other inclusion in each of the parent and daughter cells; cell wall indicated i.e. double outer line;	[4]	

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(ii)	lines drawn on Fig. and (in same place) on drawing; both measurements correct; correct expression used; allowance made for ×5000 of Fig.1.2; correct calculation anywhere, no units and no more than 2 dps;	[5]	**A.** measurements in cm if correct **A.** in words or numbers
		[Total: 21]	

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2 (a) (i)	observations recorded in each box; colour change observed around all 3 discs;	[2]	
(ii)	3 measurements recorded;	[1]	
(b) (i)	(starch) broken down / digested / changed; (starch) converted to reducing sugar / glucose / maltose; (by) enzyme / amylase; diffusion in correct context;	[max 3]	
(ii)	for germination / growth; (seeds contain) stored starch (allow qualified e.g. insoluble, stored in cotyledon); (must be changed to) soluble products / sugars; respiration / release energy; before or no photosynthesis / no chlorophyll / AW;	[max 3]	
(c)	(prepare solutions from) ground seeds of 2 different types of plant; same mass of seeds / same volume of water; set up soaked discs / place on stained paper; measure / compare diameter (of clear zones); after same length of time; AVP;	[max 3]	requires more than “same method”
		[Total: 12]	

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<table>
<tr>
<td>3 (a)</td>
<td>
<table>
<tr><th>number of spots / leaflet</th><th>number of leaflets</th></tr>
<tr><td>0</td><td>3</td></tr>
<tr><td>1</td><td>3</td></tr>
<tr><td>2</td><td>3</td></tr>
<tr><td>3</td><td>5</td></tr>
<tr><td>4</td><td>3</td></tr>
<tr><td>5</td><td>1</td></tr>
<tr><td>6</td><td>1</td></tr>
<tr><td>7</td><td>0</td></tr>
<tr><td>8</td><td>1</td></tr>
</table>
</td>
<td>[2]</td>
<td>8 correct 1 mark

7 or less 0 marks</td>
</tr>
<tr>
<td>(b)</td>
<td>axes fully labelled + at least half grid (both axes) used;
all plots correct;
8 ruled columns of equal width;</td>
<td>[3]</td>
<td>numbers central to bar
must show discrete columns, but note that column 8 has no leaflets.
Ig shading etc.</td>
</tr>
<tr>
<td>(c)</td>
<td>more / larger spots in non-polluted area / ORA;
more air pollution less disease / leaves more healthy in polluted area AW / ORA;</td>
<td>[max 1]</td>
<td></td>
</tr>
<tr>
<td>(d)</td>
<td>larger sample / use more leaflets;
all leaflets same age / size / area / same leaf back from terminal bud / position of leaflet / same bush;
leaves from same species / AVP;</td>
<td>[max 1]</td>
<td>A repeat and calculate mean / average
R collecting in new localities</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[Total: 7]</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>[40]</td>
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