CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge Ordinary Level

MARK SCHEME for the October/November 2015 series

5090 BIOLOGY

5090/31 Paper 3 (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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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)
I	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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<table>
<tr><th>Question</th><th>Expected answers</th><th>Additional guidance</th><th>Mark</th></tr>
<tr><td>1 (a) (i)</td><td>
<table>
<tr><th>sample of juice</th><th>volume / cm^3</th><th>appearance</th></tr>
<tr><td>W1</td><td>lower ;</td><td>cloudy ;</td></tr>
<tr><td>W2 + enzyme</td><td>higher ;</td><td>clear ;</td></tr>
</table>
</td><td>A colour differences for appearance e.g.dark pink for W1 and light pink for W2</td><td>[4]</td></tr>
<tr><td>(ii)</td><td>W2 greater volume (differences calculated or referenced) / clear ;</td><td></td><td>[1]</td></tr>
<tr><td>(iii)</td><td>for comparison / control ;</td><td></td><td>[1]</td></tr>
<tr><td>(iv)</td><td>to mix the enzyme into the crushed fruit / reference to even distribution ;</td><td></td><td>[1]</td></tr>
<tr><td>(v)</td><td>temperature ;
same amount of stirring / agitation / crushing / surface area ;
volume / mass of crushed fruit ;
type / age / source of fruit ;
same time to filter / type of filter paper ;
type / concentration of enzyme ;</td><td></td><td>[max 3]</td></tr>
<tr><td>(vi)</td><td>measure the mass of crushed fruit before testing ;
longer time period to filter ;
use of centrifuge instead of filtering ;
repeat and calculate a mean / average ;
heat in water bath ;
use larger volume of fruit / increase concentration of enzyme / AW ;</td><td></td><td>[max 3]</td></tr>
<tr><td>(b)</td><td>clear outline (with no shading) ;
twice size of photograph ;
correct proportion, stone and ‘dip’ shown ;
label P for point of attachment to parent plant ;</td><td></td><td>[4]</td></tr>
</table>

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Question	Expected answers	Additional guidance	Mark
(c) (i)	preparation of sample – crush / cut up **;** addition of Benedict's solution + heat **;** expected colour change blue to red **;** *safety feature*: water bath / eye protection / **AW ;**	 1 mark awarded for safety feature	 [4]
(ii)	same volume of juice **;** same reagents **;** same heating temperature **;** same period of heating **;** both filtered **;** darker colour change = more reducing sugars / **AW ;**		 [max 4]
(d) (i)	21.5 **;** 23.0 **;**		 [2]
(ii)	correct orientation and linear scale, axes labelled **;** size to fill at least half or more of printed grid (in both directions) **;** plotted points accurate and not larger than ½ of a small square in size **;** clear unbroken line passing through the plotted points **;**	x-axis 'time or t / days' and y-axis 'total loss in mass / g'	 [4]
(iii)	prevents growth of decomposers / **AW ;**		[1]
			[32]

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<table>
<tr><th>Question</th><th>Expected answers</th><th>Additional guidance</th><th>Mark</th></tr>
<tr><td>2 (a) (i)</td><td>
<table>
<tr><th>feature</th><th>frog Fig. 2.1</th><th>human Fig. 2.2</th></tr>
<tr><td>shape</td><td>oval / AW</td><td>round / circular ;</td></tr>
<tr><td>nucleus</td><td>present</td><td>absent ;</td></tr>
</table>
</td><td></td><td>[2]</td></tr>
<tr><td>(ii)</td><td>$\frac{\text{length}}{\text{magnification}}$ $\frac{10}{5000}$;

actual length $0.002 / 2 \times 10^{-3}$;

unit mm ;</td><td></td><td>[3]</td></tr>
<tr><td>(iii)</td><td>3.5 ;</td><td>Check working to show difference in size between 0.002 mm (frog) and 0.007 mm (human)

A error carried forward from (a)(ii) calculation</td><td>[1]</td></tr>
<tr><td>(b)</td><td>larger number of cells ;
small size ;
large surface area / surface area to volume ratio ;</td><td></td><td>[max 2]</td></tr>
<tr><td></td><td></td><td></td><td>[8]</td></tr>
<tr><td></td><td></td><td>Total</td><td>[40]</td></tr>
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