CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge Ordinary Level

MARK SCHEME for the October/November 2015 series

5090 BIOLOGY

5090/61 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.

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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Question	Expected answers	Additional guidance	Marks
1 (a) (i)	<table><tr><td>*sample*</td><td>volume / cm^3</td><td>*appearance*</td></tr><tr><td>***A***</td><td>12.5 ;</td><td>*clear*</td></tr><tr><td>***B***</td><td>6.0 ;</td><td>*cloudy*</td></tr></table>	**A** 6 alone	[2]
(ii)	large(r) volume / more juice **and** clarity ;	both needed for 1 mark	[1]
(iii)	for comparison / control ;		[1]
(iv)	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 ;		[max 2]
(v)	measure the mass / volume / use same volume of crushed fruit before testing ; longer time period to filter / enzyme to work ; use of centrifuge instead of filtering ; repeat + take a mean ; keep temperature constant / optimum temperature for enzyme ; increase concentration of enzyme ;		[max 2]
(b)	clear outline (with no shading) ; twice size of photograph ; correct proportion, stone and 'dip' shown ; label **P** for point of attachment to parent plant ;		[4]
(c)	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]
(d) (i)	21.5 ; 23.0 ;		[2]

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<table>
<tr><td></td><td>(ii)</td><td>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 ;</td><td>x-axis ‘time or t / days’ and y-axis ‘total loss in mass / g’</td><td>[4]</td></tr>
<tr><td></td><td>(iii)</td><td>prevents growth of decomposers / AW ;</td><td></td><td>[1]</td></tr>
<tr><td></td><td></td><td></td><td></td><td>[Total: 23]</td></tr>
<tr><td>2 (a) (i)</td><td colspan="2"><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></td><td>(ii)</td><td><u>length 10</u>
magnification / 5 000 ;

actual length: 0.002 / 2 × 10^{-3} ;

unit: mm ;</td><td></td><td>[3]</td></tr>
<tr><td></td><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></td><td>(b)</td><td>large 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></td><td>[Total: 8]</td></tr>
<tr><td>3 (a) (i)</td><td></td><td>allow conditions to stabilise / AW ;</td><td>A constant temperature / conditions</td><td>[1]</td></tr>
<tr><td></td><td>(ii)</td><td>advantage: remain dry or drier / AW ;
disadvantage: toxic / poisonous / kill / repellent / attractive (to beetles) / affects behaviour / actions of beetles / AW ;</td><td></td><td>[2]</td></tr>
<tr><td>(b) (i)</td><td></td><td>light ;
heat from lamps / (higher) temperature ;</td><td></td><td>[max 1]</td></tr>
</table>

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(ii)	light – turn light off / remove light / place light centrally / add second lamp above moist paper / cover container **;** temperature – move lamp further away / use a heat screen / introduce a fan / **AW** **;**	answer to **(b)(ii)** must relate to **(b)(i)**	[max 1]
(c)	make single (transparent) container light and dark / vary light intensity **;** keep other conditions the same **;** add beetles to apparatus **;** 10 or more beetles added **;** time period for beetles to respond **;** count / record the number of beetles in light and dark **;** repeat **+** reliability **;**	e.g. temperature, dry, moist	[max 4]
			[Total: 9]
			[Total: 40]

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