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Cambridge Ordinary Level

MARK SCHEME for the October/November 2015 series

5090 BIOLOGY

5090/62 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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<table>
<tr><th>Question</th><th></th><th>Mark</th><th>Additional guidance</th></tr>
<tr><td>1 (a)</td><td>(fruit juice) 25 + (water) 75 ;</td><td>[1]</td><td></td></tr>
<tr><td>(b) (i)</td><td>A 82
B 74
C 68
D 64
E 60
;;</td><td>[2]</td><td>all correct: 2 marks
1 error: 1 mark
2 or more errors: 0 marks</td></tr>
<tr><td>(ii)</td><td><table><tr><th>solution</th><th>concentration / %</th><th>change in length / mm</th></tr><tr><td>A</td><td>0</td><td>12</td></tr><tr><td>B</td><td>25</td><td>4</td></tr><tr><td>C</td><td>50</td><td>– 2</td></tr><tr><td>D</td><td>75</td><td>– 6</td></tr><tr><td>E</td><td>100</td><td>– 10</td></tr></table>; ; ;</td><td>[2]

[1]</td><td>5 correct calculations:
2 marks
4 correct calculations:
1 mark
3 or fewer correct calculations: 0 marks

minus signs in C, D and E:
1 mark</td></tr>
<tr><td>(iii)</td><td>1. x-axis labelled ‘concentration of fruit juice / %’ + ‘mm’ added on y-axis ;

2. linear scales with numerical values + negative values on y-axis ;

3. line / plots to use at least half grid on both axes ;

4. 5 plots correct + visible ;

5. plots joined with ruled lines / smooth curve through all plotted points ;</td><td>[5]</td><td></td></tr>
</table>

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Question		Mark	Additional guidance
(iv)	1. movement of <u>water</u> ; 2. <u>osmosis</u> ; 3. partially permeable membrane ; 4. into **A** + **B** ; 5. out of **C** + **D** + **E** ;	[5]	
(c)	repeat / replicate / larger numbers of strips + calculate mean / average ; strips taken from same (type of / species) potato / **AW** ; strips should be of same thickness / surface area / cross-sectional area ; use smaller increments for fruit juice concentrations ;	[max. 2]	
	Total:	**[18]**	
2 (a) (i)	1. clear, clean continuous outline ; 2. at least 100 mm total length + green area clearly outlined ; 3. at least part of midrib drawn with double line + not ruled + 8 veins ; 4. labels: 2 correct from lamina / petiole (leaf stalk) / midrib (main vein) / vein ;	[4]	

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Question		Mark	Additional guidance
(ii)	leaf in hot water / boiled in water ; in ethanol / alcohol ; to remove chlorophyll ; in water (to soften / remove alcohol) ; add iodine (solution) ; no naked flames / turn off or don't use Bunsen burner ;	[3] [1] [max. 4]	**A** decolourise leaf 1 mark awarded for safety point
(iii)	*green:* blue – black / black ; *white:* yellow / brown / yellow-brown ;	[2]	

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Question		Mark	Additional guidance
(b) (i)	14–17 ;	[1]	
(ii)	22–24 + mm ; divided by 500 ; length ;	[3]	**A** 2.2–2.4 + cm
	Total:	**[14]**	
3 (a)	diameter of cylinder / number of 'turns' in roll ; material cylinder made of / thickness of paper / mass (weight) of paper / type of paper ; same position of hanger / hook / masses ; same (mass / surface area) hook ;	[max. 2]	
(b) (i)	as length of cylinder / bone increases, mass (needed for bending) decreases ; as length of cylinder / bone decreases, mass (needing for bending) increases ;	[max. 1]	**A** inverse relationship **R** inversely proportional
(ii)	shorter bones are stronger / longer bones are weaker ;	[1]	must be comparative i.e. shorter / longer or both lengths of bone mentioned

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Question		Mark	Additional guidance
(c)	1. vary diameter / thickness of cylinder / thickness of paper / mass (weight) of paper / number of turns in roll / more sheets of paper ; 2. use range of diameters i.e. more than 2 ; 3. use same length / supports at same distance apart ; 4. add masses until bone bends ; 5. note / record mass that causes bending (in table) ; 6. the more mass required to bend, the stronger the 'bone' ;	[max 4]	
	Total:	**[8]**	
	Paper total:	**[40]**	

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