CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge Ordinary Level

MARK SCHEME for the October/November 2014 series

5090 BIOLOGY

5090/31 Paper 3 (Practical Test), maximum raw mark 40

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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)
- **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 Answer	Mark	Additional Guidance
1 (a) (i)	three readings ;; trend shown ;	[3]	1 or 2 readings = 1 mark
(ii)	three readings ;; trend shown ;	[3]	1 or 2 readings = 1 mark
(b) (i)	*description*: movement increases / more movement / fast(er) ; credit for using data ; *explanation*: more substrate / sugars / carbohydrates (for respiration) / increases respiration / fermentation / more CO_2 produced / AW ;	[3]	
(ii)	*description*: less / slight / slower movement of meniscus ; *explanation*: yeast did not respire / respiration decreases / stops / little / no CO_2 produced ;	[2]	
(iii)	<u>control</u> ; for comparison / AW ;	[2]	e.g. to see the effect of adding ethanol

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(c)	volume of active yeast / mixture ; bore / diameter of tubing ; meniscus starting point ;	[max. 2]	**A** 10 cm^3 mixture **I** temperature / pH / pressure / light
		[Total: 15]	

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Question	Expected Answer	Mark	Additional Guidance
2 (a) (i)	phloem ;	[1]	
(ii)	clear, continuous outline of all three cells as in Fig 2.1 **+** no shading ; size (min. 80 mm across) ; cell walls indicated by double line ; correct proportion of the three cells ;	[4]	**R** if cells not touching need not be continuous correct proportion of wall thickness 1st and 2nd cells of similar size **+** both larger than 3rd
(b)	measurement on Fig. 2.1 (7 ± 1 mm) and on drawing (± 2 mm) ; measurement of drawing ÷ measurement on Fig.2.1 ; × 240 ; answer ;	[4]	**R** if change units **A** ecf **R** if units used max. 2 d.p.
(c) (i)	axes labelled with units ; size to fill at least ½ of grid **+** linear scale on y-axis ; plot correct ± 1 mm ; all columns drawn ruled and of equal width ;	[4]	y – mass / g ; x – plant **+** names centred to bar **A** rotation of axes through 90° with zero or scale break **A** columns touching or separate **I** shading, etc.

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(ii)	2900 ÷ 600 ; 4.8 (times) ;	 [2]	
(iii)	diameter / thickness (of fibre) ;	[1]	**A** (presence of) lignin / cellulose
		[Total: 16]	

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<table>
<tr><th>Question</th><th>Expected Answer</th><th>Mark</th><th>Additional Guidance</th></tr>
<tr><td>3 (a)</td><td>
<table>
<tr><th>feature</th><th>in the dark</th><th>in the light</th></tr>
<tr><td>leaf</td><td>small / pale</td><td>large / dark ;</td></tr>
<tr><td>stem</td><td>long / tall</td><td>short / dwarf ;</td></tr>
<tr><td>root</td><td>narrow / straight</td><td>wide / curled ;</td></tr>
</table>
</td><td>[3]</td><td></td></tr>
<tr><td>(b)</td><td>grow in substrate (on paper / soil) ;

same type / batch / age of seeds / species / type of plant / number ;

same external conditions / named condition ;

same <u>volume</u> of water ;

carried out at more than one temperature / AW ;

min. 3 <u>stated</u> temperatures between 10 °C and 60 °C ;

replicates / repeat for each temperature + mean ;

left for same length of time / same number of days OR time taken for germination recorded ;

comparison of no. germinating / rate of germination / AW ;</td><td>[max. 6]</td><td>e.g. light intensity, O_2 concentration
I pressure
A stated volume

A mark if more than 1 seed used earlier + mean
If time stated, must be > 1 day</td></tr>
<tr><td></td><td></td><td>[Total: 9]</td><td></td></tr>
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