CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge Ordinary Level

MARK SCHEME for the October/November 2014 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.

Cambridge will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the October / November 2014 series for most Cambridge IGCSE®, Cambridge International A and AS Level components and some Cambridge O 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)
- **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

Question	Expected Answer	Mark	Additional Guidance
1 (a)	A and C ; time / min	[2]	**R** 'm' for minutes, seconds **A** 't' for time
(b)	A – 0, 8, 10, 12 ; B – 0, 1, 1, 2 ; C – 0, 10, 15, 22 ;	[3]	
(c) (i)	*description*: no / very slight / slower movement of meniscus ; *explanation*: (ethanol) inhibits / kills the yeast / yeast did not respire / respiration decreases / stops / little / no CO_2 produced ;	[2]	
(ii)	*description*: movement increases / more / most movement / fast(er) ; *explanation*: more substrate / sugars / carbohydrates (for respiration) / increases respiration / fermentation / more CO_2 produced / AW ;	[2]	

(iii)	control ; for comparison / AW ;	[2]	e.g. to see the effect of adding ethanol
(d)	volume of active yeast ; total volume of mixture / volume of added substance ; bore / diameter of tubing ; meniscus starting point ;	[max. 2]	**A** 10 cm^3 active yeast **A** 15 cm^3 mixture / 5 cm^3 added substance **I** temperature / pH / pressure / light
(e)	limewater ; clear to cloudy / AW ;	[2]	**A** other tests for carbon dioxide, e.g. hydrogencarbonate solution; red to yellow ;
		[Total: 15]	

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.

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

<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>
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</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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