Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

BIOLOGY **0610/52**

Paper 5 Practical Test **October/November 2017**

MARK SCHEME

Maximum Mark: 40

Published

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Mark schemes will use these abbreviations

- **;** separates marking points
- / alternatives
- **I** ignore
- **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 any valid point
- **ecf** credit a correct statement / calculation that follows a previous wrong response
- **ora** or reverse argument
- ( ) the word / phrase in brackets is not required, but sets the context
- underline actual word given must be used by candidate (grammatical variants excepted)
- max indicates the maximum number of marks that can be given

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Question	Answer	Marks	Guidance
1(a)(i)	table drawn with minimum two columns and a line between heading and data ; appropriate column / row headings and appropriate units for percentage concentration of amylase time for starch to be digested / minutes ; three correct amylase concentration recorded in any order; table shows 2 columns for each concentration with times recorded; correct trend shown by results ;	**5**	**R** if units in body of table **I** units in the body of the table (expect 3% faster 2% faster 1%)
1(a)(ii)	idea that iodine remains brown / yellow / orange / no longer changes colour;	**1**	
1(a)(iii)	(remove a sample from each of the test-tubes and) add (equal volume of) Benedict's solution ; heat (in a water-bath) ;	**2**	

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<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th><th>Guidance</th></tr>
<tr><td>1(b)(i)</td><td>
<table>
<tr><td>variable</td><td>controlled by</td></tr>
<tr><td>(volume of) starch (solution)</td><td>5 cm^3/ same volume</td></tr>
<tr><td>(concentration of) starch solution</td><td>same concentration / used throughout</td></tr>
<tr><td><u>volume</u> of enzyme / amylase</td><td>1 cm^3 used</td></tr>
<tr><td>temperature</td><td>kept at 55–60 ° C</td></tr>
<tr><td>time</td><td>3 minutes for incubation / 5 minutes for testing the enzyme</td></tr>
</table>
; ;</td><td>2</td><td>one mark for the variable, one mark for method of controlling which must related

I amount of enzyme

I same temperature</td></tr>
<tr><td>1(b)(ii)</td><td>so the contents of all the test-tubes reach the same temperature / AW ;</td><td>1</td><td></td></tr>
<tr><td>1(b)(iii)</td><td>to show that there is no starch in the enzyme solution / to show enzyme does not react with starch / AW ;</td><td>1</td><td></td></tr>
</table>

Question	Answer	Marks	Guidance
1(c)(i)	idea of judging the colour of the endpoint by eye **;** idea of doing several procedures at the same time **;** idea that only one drop for both spots of iodine (might give different volumes) **;** idea that 1 drop for both spots (could cause contamination)**;** idea of: two samples needed at the same time with the same rod, (then there will be a difference in the actual time) **;** idea of: size of drops (from either starch or iodine) added varies **;**	**2**	

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<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th><th>Guidance</th></tr>
<tr><td>1(c)(ii)</td><td>
<table>
<tr><td>e.g. of error</td><td>improvement</td></tr>
<tr><td>judging colour by eye</td><td>have a standard colour for comparison</td></tr>
<tr><td>timing and sampling at same time</td><td>start timer then mix and sample and note time when first sample taken</td></tr>
<tr><td>one drop for two samples</td><td>use a dropper with enough for both samples / have two glass rods</td></tr>
<tr><td>contamination</td><td>use separate glass rods</td></tr>
<tr><td>doing two samples at the same time</td><td>take a sample from each tube at the same time with different glass rod / do trials separately</td></tr>
<tr><td>size of drop for either</td><td>use a syringe / pipette</td></tr>
<tr><td>time not long enough for enzyme to work</td><td>keep going until all starch has gone</td></tr>
</table>
;</td><td>1</td><td>improvement must match one of the errors from 1(c)(i)</td></tr>
<tr><td>1(d)(i)</td><td>300 (mg) ;;;</td><td>3</td><td>if answer incorrect one mark for correct unit and one mark for correct working:
$(3 \cdot 2 \cdot 0.5) \div 3\,cm^3$ is max 2</td></tr>
<tr><td>1(d)(ii)</td><td>3.4 ;</td><td>1</td><td>ecf from 1(d)(i)</td></tr>
</table>

Question	Answer	Marks	Guidance
1(d)(iii)	**A**(xes) – labelled with units **;** **S(**cale) – even scale **;** **P(**lot) – all given points plotted accurately ±½ square **;** **L**(ines) – each line drawn (with a ruler) point to point / smooth free-hand curve through points **;**	**4**	

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<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th><th>Guidance</th></tr>
<tr><td>2(a)(i)</td><td>
<table>
<tr><td>feature</td><td>epidermis cell</td><td>guard cell</td></tr>
<tr><td>shape</td><td>wavy outline</td><td>oval / bean, shaped / AW ;</td></tr>
<tr><td>chloroplasts / cell inclusions</td><td>absent</td><td>present ;</td></tr>
<tr><td>cell wall</td><td>thin</td><td>thick / thick on inside edge ;</td></tr>
<tr><td>cell size</td><td>large</td><td>small ;</td></tr>
<tr><td>cell arrangement</td><td>not paired</td><td>pairs ;</td></tr>
</table>
</td><td>2</td><td>one mark per correct row</td></tr>
<tr><td>2(a)(ii)</td><td>outline single clear continuous lines, no shading, 2 cells drawn ;

drawing occupies at least 50 mm along X–Y ;

stoma width is about one sixth of total width of XY ;

cell walls drawn as double line not too wide ;</td><td>4</td><td></td></tr>
<tr><td>2(b)</td><td>(diameter of guard cells and stomata) value within the range of 31 – 34 mm ;

line drawn on candidates diagram and measurement ±1 mm;

calculated magnification ;</td><td>3</td><td></td></tr>
</table>

Question	Answer	Marks	Guidance
2(c)	absorption (rate) is lower than transpiration 09:00 to 18:00 / during the day / during the light **ora ;** absorption (rate) is higher than transpiration from 18:00 to 06:00 / at night / in the dark **ora ;** absorption peaks at 18.00 and transpiration peaks between 14:00 to16:00 / absorption rate peaks after transpiration rate **ora ;** transpiration rate increases faster than absorption rate **;** comparative data quote for both curves **;** rate of absorption and rate transpiration are equal between 08:00 to 09:00 / at 18:00 **;**	**2**	**A** times in am and pm equivalents **A** some variation in the 09:00 time

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Question	Answer	Marks	Guidance
2(d)	1 ref. to using at least 3 temperatures / humidity ;	**6**	
	2 ref. to (three) values for temperature / humidity ;		**A** high, medium and low for humidity and temperature
	3 ref. to means of obtaining the different temperatures / humidity;		
	4 ref. to checking that the apparatus does not leak ;		
	5 ref. to one controlled variable ;		e.g. for mp 5 and mp 6: light intensity, light wavelength, wind speed, temperature or humidity
	6 ref. to second controlled variable;		
	7 ref. to measuring distance moved (by the air) along capillary ;		
	8 ref. to fixed time / timing for a fixed distance ;		
	9 ref. to refilling capillary between measurements ;		
	10 ref. to at least two replicates ;		
	11 use same shoot / same number of leaves / same area of leaves ;		
	12 AVP ; e.g. detail of apparatus set up e.g. cutting shoot underwater / drying leaves allow apparatus to equilibrate before taking any readings		

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