



**Botswana General Certificate of Secondary Education  
October/November 2025**

**Confidential Mark Scheme  
SPECIMEN**

**1428/02 BIOLOGY**

**Maximum Mark: 50**

## Mark scheme notes

**A1** answer marks that generally follow **compensation mark** or a **method mark**. The answer mark is awarded only when the answer is obtained from the correct working or method.

**B1** an independent mark that is awarded whenever the answer given is correct.

**C1** compensation mark for writing the correct preceding formula or condition. The mark may not be given when the formula required has not been given.

**M1** method mark that must be seen before awarding the answer mark

**( )** the word, phrase or unit in brackets is not required but is in the mark scheme for clarification

**accept** the response is not necessarily the perfect answer but may be credited

**reject** do not accept some answers that candidates may write and they appear to be correct

**and** both responses are necessary for the mark to be given

**c.a.o** correct answer only

**e.c.f.** error carried forward; marks are awarded if a candidate has carried an incorrect value forward from earlier working, provided the subsequent working is correct.

**ignore** this response is to be disregarded and does not negate an otherwise correct response

**/ or** alternative responses for the same marking point

**AW** alternative wording. This is applicable where there are several ways of writing the correct response **underline** mark is not allowed unless the underlined word or idea is used by candidate

**unit penalty** the unit that follows the answer is required. There must a maximum of **one** unit penalty per question unless otherwise indicated and not more than **four** in the whole question paper.

**in any form** indicates that the formula can be presented in any other form that may include changing the subject of the formula or using numbers to represent the formula

**BOD** benefit of the doubt given when an examiner is not very certain about a response

**spelling** be generous about spelling but ensure the science is not distorted. Single answer words should not have any other meaning while those used in phrases and sentences should be interpreted from the sentence.

**decimal places** unless specified ignore the number of decimal places for an answer.

Number	Answer	Mark	Additional Guidance																
1 (a)	<ul style="list-style-type: none"><li>- size (cover more than half the space provided);</li><li>- layout (clear, not sketchy and no shading);</li><li>- realistic (resemblance + correct shape + proportion);</li><li>- detail - seeds + stalk + double skin;</li></ul> <p>labels: seeds / stalk / skin;;</p>	6	<p><b>accept</b> at most 2 line breaks in outline</p> <p><b>accept</b> at most 2 line breaks per detail</p> <p>Max 1 for details Max 2 for labels</p>																
(b)(i)	<ul style="list-style-type: none"><li>- line drawn on longest length;</li><li>- correct value for length of drawing recorded + units correctly expressed + a length for specimen <b>M</b> recorded;</li></ul>	2																	
(ii)	<ul style="list-style-type: none"><li>- correct formula / substitution;</li><li>- correct calculation;</li><li>- correct answer expressed to 1 dp + multiplication symbol / X / x / times;</li></ul>	3																	
(c)	<p>Similarities:</p> <ul style="list-style-type: none"><li>- have seeds;</li><li>- have a skin;</li></ul> <p>Differences:</p> <table><thead><tr><th>specimen <b>M</b></th><th>specimen <b>N</b></th></tr></thead><tbody><tr><td>thinner skin</td><td>thicker skin</td></tr><tr><td>correct ref to skin colour</td><td>correct ref to skin color</td></tr><tr><td>smaller seeds</td><td>larger seeds</td></tr><tr><td>correct ref to seed colour</td><td>correct reference to seed colour</td></tr><tr><td>stalk present</td><td>no stalk</td></tr><tr><td>circular / oval</td><td>elongated / AW</td></tr><tr><td>soft / fleshy / juicy</td><td>hard / dry</td></tr></tbody></table>	specimen <b>M</b>	specimen <b>N</b>	thinner skin	thicker skin	correct ref to skin colour	correct ref to skin color	smaller seeds	larger seeds	correct ref to seed colour	correct reference to seed colour	stalk present	no stalk	circular / oval	elongated / AW	soft / fleshy / juicy	hard / dry	5	<p>Max 2 for similarities</p> <p>MTFOPL</p> <p>Max 3 for differences</p> <p>MTFOPL</p>
specimen <b>M</b>	specimen <b>N</b>																		
thinner skin	thicker skin																		
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(d)	<ul style="list-style-type: none"> <li>- crush seeds;</li> <li>- add water;</li> <li>- add Biuret solution/copper sulphate and sodium hydroxide;</li> <li>- purple / mauve / violet colour means proteins present;</li> <li>- blue colour means no proteins;</li> </ul>	5	AW <b>accept</b> make solution
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Number	Answer	Mark	Additional Guidance
2(a)(i)	- foam/bubbles;	1	
(ii)	<ul style="list-style-type: none"> <li>- three values recorded in table with no units in body of table;</li> <li>- trend (lower L1, lowest L2, highest L3);</li> <li>- accuracy (whole number values);</li> </ul>	3	For trend: lower, lowest and highest in terms of values obtained
(iii)	<ul style="list-style-type: none"> <li>- correct orientation of axes;</li> <li>- units given on y-axis;</li> <li>- linear scale + plotted points cover more than half the space provided;</li> <li>- correct height of bars;</li> <li>- consistent width of bars + equal spaces in between bars;</li> </ul>	5	
(iv)	<ul style="list-style-type: none"> <li>- <b>L1</b> no/small height of foam/bubbles;</li> <li>- enzymes inactive;</li> <li>- <b>L2</b> no foam produced;</li> <li>- enzyme denatured;</li> </ul>	4	<b>accept</b> enzymes less active (for less foam)
(b)(i)	<ul style="list-style-type: none"> <li>- <b>L4</b> foam/bubbles;</li> <li>- <b>L5</b> no foam/bubbles;</li> </ul>	2	AW

(ii)	<ul style="list-style-type: none"> <li>- <b>L4</b> enzymes/substrate gain kinetic energy and bind with substrates / active site not damaged;</li> <li>- <b>L5</b> enzyme active site permanently damaged so no substrate binds / enzyme denatured;</li> </ul>	2	AW
(c)	<ul style="list-style-type: none"> <li>- adaptation of enzymes / acclimatize / equilibrate to temperature;</li> <li>- contents of test-tube at the correct temperature;</li> </ul>	2	AW
(d)	<ul style="list-style-type: none"> <li>- calculating averages;</li> <li>- using calibrated tubes / gas syringe / measuring cylinder (to measure volume of gas);</li> <li>- repeat the investigation;</li> <li>- use a bigger range of temperatures;</li> <li>- use a measuring cylinder / volumetric pipette (to measure volume of peroxide);</li> </ul>	2	AW
(e)	<ul style="list-style-type: none"> <li>- wearing protective gloves;</li> <li>- use a test-tube holder;</li> <li>- wear goggles;</li> </ul>	1	Max 1

Number	Answer	Mark	Additional Guidance
3(a)	<ul style="list-style-type: none"> <li>- (necessity of) carbon dioxide;</li> <li>- (sun)light;</li> </ul>	2	
(b)	<ul style="list-style-type: none"> <li>- destarch / remove starch;</li> </ul>	1	AW
(c)(i)	<ul style="list-style-type: none"> <li>- iodine solution;</li> </ul>	1	<b>reject</b> iodine alone
(ii)	<ul style="list-style-type: none"> <li>- brown;</li> </ul>	1	
(d)	<ul style="list-style-type: none"> <li>- reactants: carbon dioxide + water;</li> <li>- products: oxygen + glucose;</li> </ul>	2	