Mark Scheme (Results)

January 2025

Pearson Edexcel International Advanced Subsidiary Level In Biology (WBI13)
Paper 01 Practical Skills in Biology I

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General Marking Guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than penalised for omissions.
- Examiners should mark according to the mark scheme not according to their perception of where the grade boundaries may lie.
- There is no ceiling on achievement. All marks on the mark scheme should be used appropriately.
- All the marks on the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the team leader must be consulted.
- Crossed out work should be marked UNLESS the candidate has replaced it with an alternative response.

Question Number	Answer	Additional Guidance	Mark
1(a)	• sclerenchyma (1) • xylem (1)	Mark the first two answers	(2)

Question Number	Answer	Additional Guidance	Mark
1(b)(i)	An answer that includes one of the following points: • the {force / weight / strain / stress / tension / pressure} a {fibre / material} can take without breaking OR the {force / weight / strain / stress} required to make a fibre break (1)	IGNORE refs to cross sectional area ACCEPT snapping etc.	(1)

Question Number	Answer	Additional Guidance	Mark
1(b)(ii)	An answer that includes the following points: • range of fibre lengths suggested / implied (1) • fibre variables taken into account (1) • appropriate environmental variable controlled (1) • appropriate description of how masses are added (1) • adding masses until fibre breaks / measure the mass that {breaks the fibre / that the fibre can hold before breaking} (1) • description of appropriate safety precaution with reason (1)	minimum two. ACCEPT if plot length vs mass added e.g. cross sectional area, diameter, width, plant type, age, ACCEPT if cross sectional area used in a calculation e.g. humidity, temperature, fibre pre-treatment NOT light intensity IGNORE same conditions ACCEPT carefully, small weights added one at a time etc.	(4)

<table>
<tr><th>Question Number</th><th>Answer</th><th>Additional Guidance</th><th>Mark</th></tr>
<tr><td>1(c)(i)</td><td>table drawn with the following features:

• suitable table drawn (1)

• headings with units (1)

• all data correctly entered (1)</td><td><table><tr><th>Fibre Length (/) mm</th><th>Tensile Strength (/) MPa</th></tr><tr><td>5</td><td>200</td></tr><tr><td>15</td><td>190</td></tr><tr><td>25</td><td>170</td></tr><tr><td>30</td><td>168</td></tr><tr><td>35</td><td>160</td></tr></table>
NOT mm^{-1}
IGNORE order, both horizontally and vertically
Lose mp2 if units in cells
Inconsistent decimal places within a column loses mp3</td><td>(3)</td></tr>
</table>

<table>
<tr><th>Question Number</th><th>Answer</th><th>Additional Guidance</th><th>Mark</th></tr>
<tr><td>1(c)(ii)</td><td>A calculation that includes the following steps:

• correct calculation of gradient (1)</td><td>e.g. (160-200) ÷ 30 = -1.33 or -1.3
Must have minus sign

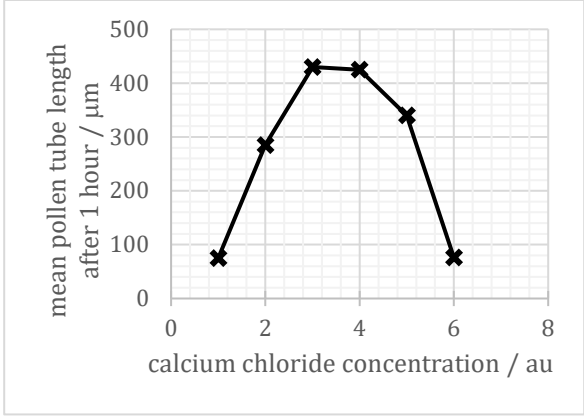
IGNORE 4/3 or other fraction</td><td>(1)</td></tr>
</table>

Question Number	Answer	Additional Guidance	Mark
1(c)(iii)	A calculation that includes the following steps: • find a value for c (1) • correct assembly into equation (1)	ecf from 1cii e.g. c = 200 – (-1.33 x 5) = 206.7 (or 620/3) or by extrapolation ACCEPT 206 to 207 If minus not in 1cii do not penalise again. e.g. y = -1.33x + 206.7 (206-207) ACCEPT y = - 4/3x + 620/3 as ecf ACCEPT mixture e.g. y =-4/3x + 207 Ecf their value of c from above	(2)

Question Number	Answer	Additional Guidance	Mark
1(d)(i)	• as fibre length increases breaking strength decreases / negative correlation (1)		(1)

Question Number	Answer	Additional Guidance	Mark
1(d)(ii)	An answer that includes the following points. • bamboo may have different structure (to jute / coir) (1) • **number** of junctions may differ (1) • junctions may make fibre {weaker / stronger} at j (1) • {more / less} lignin (1)	ACCEPT description e.g. thicker But must be structural	(3)

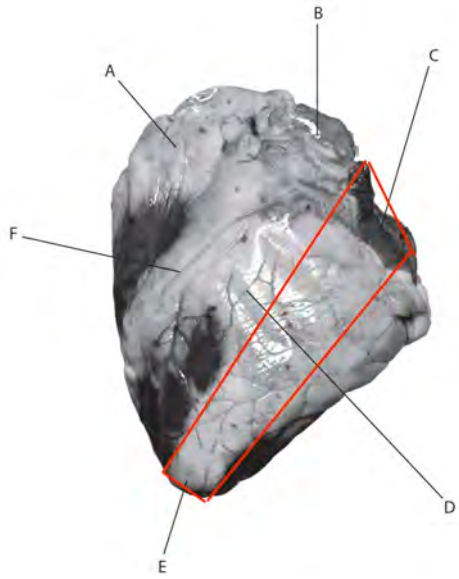
Question Number	Answer	Additional Guidance	Mark
2(a)	A description that includes the following points: • (digests a) pathway (through the style) / releases (digestive) enzymes (1) • for {male gametes / male nucleus generative nucleus(ii) / sperm} to the ovule (1)	IGNORE ovary, ACCEPT ovum, egg, female gamete	(2)

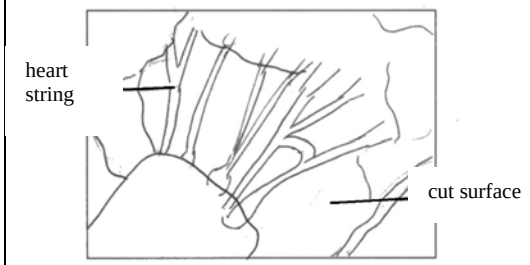
Question Number	Answer	Additional Guidance	Mark
2(b)(i)	A graph showing the following features: • A axes correct (x – calcium chloride concentration / y – mean pollen tube length after 1 hour (1) • L axes correctly labelled and with units (1) • S linear scale on the x-axis (1) • P correct plotting on a linear scale on y (1)	 IGNORE line but if extrapolate to 0 on y loses mp P	(4)

Question Number	Answer	Additional Guidance	Mark
2(b)(ii)	A description that includes the following points: • use a range of 6 solutions of calcium chloride / from 1 – 6 au (1) • use of sucrose solution / boric acid (1) • controlled variable (1) • place pollen {on agar plate / in hanging drop} (1) • leave for 1 hour (1) • use a microscope **and** (calibrated) graticule to measure pollen tube length (1) • repeat readings at each calcium chloride concentration to allow calculation of mean (1)	ACCEPT $CaCl_2$, Ca ions, NOT Calcium e.g. temperature, pH, plant type, plant species NOT light intensity NOT use of Vernier calliper ACCEPT average	(6)

Question Number	Answer	Additional Guidance	Mark
2(b)(iii)	An answer that includes three of the following points: • pollen tubes do not grow at 1 au or 6 au (1) • {tube growth is (nearly) constant between 3 and 4 au / {highest / optimum} growth {at 3 au / between 3 and 4 au / figure between 3 and 4 au quoted} (1) • the relationship is non-linear (1) • comment on {the lack of a control / no data for 0 au $CaCl_2$ / no SDS (1)	ACCEPT pollen tubes grow between 2 au and 5 au ACCEPT no growth at 1 au and very little a 6 au ACCEPT a description which implies non-linear ACCEPT error bars	(3)

Question Number	Answer	Additional Guidance	Mark
3(a)(i)	Each label correct for one mark (1,1,1,1)	Apex - E Atrium – A Ventricles meet – F Coronary blood vessel – D No mark if more than one letter in a cell	(4)

Question Number	Answer	Additional Guidance	Mark
3(a)(ii)	To the right of the place where the right and the left ventricles meet, must not intersect line F (1)	IGNORE if intersects the meeting place anywhere. the line needs to be anywhere in the red box 	(1)

Question Number	Answer	Additional Guidance	Mark
3(a)(iii)	A drawing with the following features: • minimum 4 and maximum 6 discernible strings at least one of which branches. (1) • heart strings labelled (1) • face of cut wall labelled on either side more or less in line with cords (1)	e.g.  ACCEPT cords, tendons, tendinous cords	(3)

Question Number	Answer	Additional Guidance	Mark
3(b)	An answer which includes any four of the following points: Similarities, any two of: • both have valves, strings, atria, ventricles, chambers (2) Differences, any two of: • both ventricles have a larger (internal) volume in the DCM heart (1) • (in both ventricles) the {wall / muscle} is thinner in the DCM heart (1) • the septum is thinner in the DCM heart (1) • strings different	ACCEPT reverse argument ACCEPT reverse argument ACCEPT reverse argument ACCEPT cords, tendons, tendinous cords	(4)

Question Number	Answer	Additional Guidance	Mark
3(c)(i)	• heart health / type of heart / with and without DCM (1)	NOT healthy heart	(1)

Question Number	Answer	Additional Guidance	Mark
3(c)(ii)	A calculation showing the following steps: • correct difference calculated (1) • correct division and x 100 (1)	 e.g. (20.36- 13.26) = 7.10 e.g. 7.10 ÷ 13.26 = 0.5354 x 100 = 53.5 % If answer is 34.9 with no working or 7.1 not shown give 1 mark	 (2)

<table>
<tr><th>Question Number</th><th>Answer</th><th>Additional Guidance</th><th>Mark</th></tr>
<tr><td>3(c)(iii)</td><td>An answer which includes any three of the following points:

• the biggest change is shown in measurement 1 (1)

• the smallest change is in measurement 4 (1)

• 1 2 & 3 change by about the same lengths (1)

• correct calculation to support any point made (1)</td><td>
<table>
<tr><th colspan="2">percentage change in DCM heart</th></tr>
<tr><th>Actual length change</th><th>%age change</th></tr>
<tr><td>1.93</td><td>102.7</td></tr>
<tr><td>1.9</td><td>59.4</td></tr>
<tr><td>1.89</td><td>58.0</td></tr>
<tr><td>1.38</td><td>28.0</td></tr>
</table>
</td><td>(3)</td></tr>
</table>

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