Pearson

Mark Scheme (Results)

Summer 2026

Pearson Edexcel International Advanced Subsidiary Level in Biology

WBI13/01A

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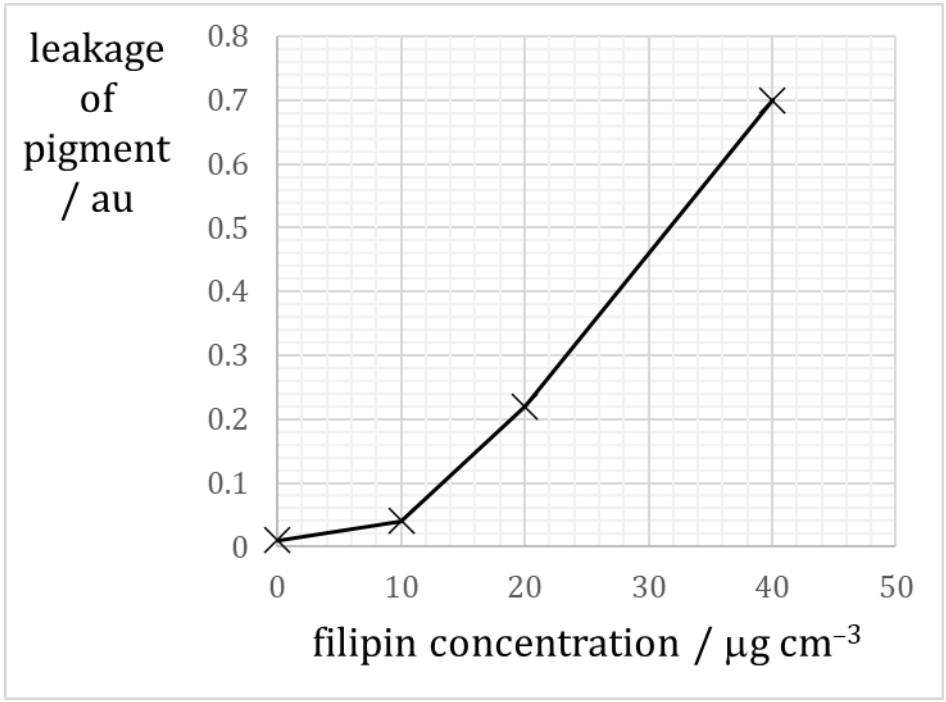
General Marking Guidance

- 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)	An answer that includes two of the following points: • (it takes time for) the membranes to be disrupted (1) • (it takes time for) filipin to {enter/diffuse} into the vacuole (1) • (it takes time for) pigment to {leave/diffuse} out of the cell (1)	**IGNORE** osmosis **ACCEPT** membrane remains intact for 20 mins **ACCEPT** phospholipid (bilayer)/tonoplast **ACCEPT** becomes more permeable/pigment leaks out	**(2)**

Question Number	Answer	Additional Guidance	Mark
1(b)(i)	An answer that includes four of the following points: • reference to ube pieces should be the same (1) • ube pieces rinsed under running water (1) • ube pieces placed into each of the four different filipin concentrations (1) • one named control variable kept constant (1) • (the ube piece is removed and) the remaining solution formed is shaken (1) • Sample every 20minutes/repeatedly until 200 minutes (1) • description of method of assessing quantity of pigment lost (1)	**IGNORE** mass **ACCEPT** same size/volume/SA **ACCEPT** stated concentrations **IGNORE** range e.g. temperature, pH e.g. use of colorimeter, standard chart	**(4)**

Question Number	Answer	Additional Guidance	Mark
1(b)(ii)	A graph with the following features: • A axes correct x – filipin concentration, y –leakage of pigment (1) • L axes correctly labelled with units (1) • P correct plotting on a **linea**r scale on y and x (1) • S points joined with straight lines (1)	 Bar graph not mp4	**(4)**

Question Number	Answer	Additional Guidance	Mark
1(b)(iii)	An answer that includes four of the following points: • there is {some / very little} leakage with no filipin (1) • because of {physical damage / inadequate rinsing} (1) • more filipin leads to more leakage (1) • because there are more filipin-cholesterol (complexes) (1) • so (more) gaps for the pigment to leak through (1) • no error bars so the difference may not be significant (1)	**ACCEPT** permeability e.g. cut surfaces **IGNORE** fluidity **ACCEPT** correct refs to diffusion	**(4)**

Question Number	Answer	Additional Guidance	Mark
1(c)	An explanation that includes the following points: • each channel formed by two gramicidin molecules (1) • the channels form randomly (1) • channels allow {current/ions to flow} (of 1 a.u.) (1) • when there is no current, there are no gramicidin channels formed (1) ORA • the greater the number of channels formed, the greater the current (1) ORA	**ACCEPT** other correct comments for current of two or three a.u. **ACCEPT** the greater the number of ions	**(3)**

Question Number	Answer	Additional Guidance	Mark
2(a)(i)	• three hours	**ACCEPT** 3-4 hrs/180-240 minutes	**(1)**

Question Number	Answer	Additional Guidance	Mark
2(a)(ii)	A description that includes two of the following points: • cell plate forms (1) • cell wall forms (1) • the cytoplasm divides (1) • to form two genetically identical cells (1)	**ACCEPT** cytokinesis **IGNORE** haploid/diploid	**(2)**

Question Number	Answer	Additional Guidance	Mark
2(a)(iii)	• R, Q, S, P (1)		**(1)**

Question Number	Answer	Additional Guidance	Mark
2(b)	A justification which includes the following points: • (so that) dividing cells can be found (only) at {meristems / tips} (1) • to {macerate / break down} the tissue / to dissolve the middle lamella/easier to separate cells (1) • to remove the HCl / make the chromosomes visible (1) • to allow chromosomes, which are too small to see with the naked eye, to be seen (1) • to flatten the preparation / to allow squash / to separate cells/to protect the (objective) lens (1)	**ACCEPT** cells undergoing mitosis **ACCEPT** remove pectin/to separate cells /soften tissue **ACCEPT** to be placed on a microscope **IGNORE** microscope slide **ACCEPT** to stop cells moving **IGNORE** dehydration	**(5)**

Question Number	Answer	Additional Guidance	Mark
2(c)(i)	• (number of) cells undergoing mitosis (1)	**ACCEPT** mitotic index / RDR	**(1)**

Question Number	Answer	Additional Guidance	Mark
2(c)(ii)	An answer that includes two of the following paired points: • temperature (1) • use a thermostatically controlled water bath (1) **OR** • pH (1) • use a buffer (1) **OR** • light (1) • description of how an aspect of light is controlled (1) **OR** • mineral ions (1) • use a standard solution (1)	Mark the first answer on each line **ACCEPT** incubator/AC/TC waterbath/waterbath set at constant temperature **ACCEPT** in the dark **ACCEPT** a suitable stated ion **IGNORE** humidity	**(4)**

<table>
<tr><th>Question Number</th><th>Answer</th><th>Additional Guidance</th><th>Mark</th></tr>
<tr>
<td>2(c)(iii)</td>
<td>A table with the following features:

• suitable table drawn (1)

• correct column headings with units (1)

• all data entered correctly (1)</td>
<td>
<table>
<tr><td>Aflatoxin concentration / a.u.</td><td>RDR (%)</td></tr>
<tr><td>0</td><td>100</td></tr>
<tr><td>80</td><td>52</td></tr>
<tr><td>800</td><td>20</td></tr>
<tr><td>2000</td><td>54</td></tr>
<tr><td>3000</td><td>76</td></tr>
<tr><td>10000</td><td>120</td></tr>
</table>

Not MP3 if units in table
</td>
<td>(3)</td>
</tr>
</table>

Question Number	Answer	Additional Guidance	Mark
2(c)(iv)	An answer that includes the following points: • the effect on cell division/RDR depends on concentration (1) • aflatoxin leads to a decrease in RDR at concentrations from 100 to 6800 ppb / above 6800 ppb aflatoxin leads to more cell division than {in a control / at 0 ppb} (1) • the results do **not** support the statement because they were produced using plant cells (1)	**ACCEPT** mitotic index **ACCEPT** description of effect **ACCEPT** above 6800ppb RDR is more than 200%	**(3)**

Question Number	Answer	Additional Guidance	Mark
(3)(a)	A calculation that includes the following steps: • calculation (1) • answer to two significant figures (1)	actual = 7 ÷ 0.78 = 8.97 cm 9.0 **ACCEPT** wrong working giving an answer to two sig figs for MP2	**(2)**

Question Number	Answer	Additional Guidance	Mark
3(b)(i)	• E	No alternative answers	**(1)**

Question Number	Answer	Additional Guidance	Mark
3(b)(ii)	An answer that matches one of the following: • correct sequence: I, B, C, G (2) **OR** • any three in the correct sequence (1)		**(2)**

<table>
<tr><th>Question Number</th><th>Answer</th><th>Additional Guidance</th><th>Mark</th></tr>
<tr><td>3(c)</td><td>A calculation with the following steps:

• correct difference in measurements (1)

• correct percentage increase calculated (1)</td><td>ACCEPT range (left) 2.8 to 3.2 (right) 3.2 to 3.6

<table><tr><th>A (mm)</th><th>B = 3.2 mm</th><th>B = 3.3 mm</th><th>B = 3.4 mm</th><th>B = 3.5 mm</th><th>B = 3.6 mm</th></tr><tr><td>2.8</td><td>14.3%</td><td>17.9%</td><td>21.4%</td><td>25.0%</td><td>28.6%</td></tr><tr><td>2.9</td><td>10.3%</td><td>13.8%</td><td>17.2%</td><td>20.7%</td><td>24.1%</td></tr><tr><td>3.0</td><td>6.7%</td><td>10.0%</td><td>13.3%</td><td>16.7%</td><td>20.0%</td></tr><tr><td>3.1</td><td>3.2%</td><td>6.5%</td><td>9.7%</td><td>12.9%</td><td>16.1%</td></tr><tr><td>3.2</td><td>0.0%</td><td>3.1%</td><td>6.3%</td><td>9.4%</td><td>12.5%</td></tr></table>
MP1 must be in the range shown
MP2 % must be an increase
A correct increase using other measurements (width) MP2 only</td><td>(2)</td></tr>
</table>

Question Number	Answer	Additional Guidance	Mark
3(d)(i)	A calculation with the following steps: • correct reading of heights of the three categories (1) • expressed as ratio (1)	 e.g. 68, 98, 60 e.g. 1.1(3) : 1.6(3) correct answer only 2 marks	 **(2)**

Question Number	Answer	Additional Guidance	Mark
3(d)(ii)	An answer which includes the following points: • LVV increases with age (1) • the effect of DCM type 1 is larger than DCM type 2 (1) • DCM type 1 shows the greatest increase in LVV (especially at 8 and 16 weeks) (1) • normal animals have the lowest LVV, with DCM type 2 intermediate between normal and DCM type 1 (1) • a comment on the significance of any relevant difference	MP4 e.g At 2–4 weeks the error bars for all groups overlap, suggesting no significant differences at early ages. At 16 weeks, there is little overlap between Normal and DCM type 1, suggesting a significant difference in LVV. DCM type 1 and Normal show reduced overlap in error bars at later time points (8–16 weeks), suggesting possible significance. At earlier time points (2 and 4 weeks), strong overlap of error bars between all groups suggests differences are not significant. Between DCM type 1 and DCM type 2 at 8–16 weeks, partial overlap suggests differences may or may not be significant.	**(4)**