GradeMax

Pearson

Mark Scheme (Results)

January 2026

Pearson Edexcel International Advanced Subsidiary level In Biology
WBI13/01

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January 2026
Question Paper Log Number P79033A
Publication Code WBI13_01_2601_MS
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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

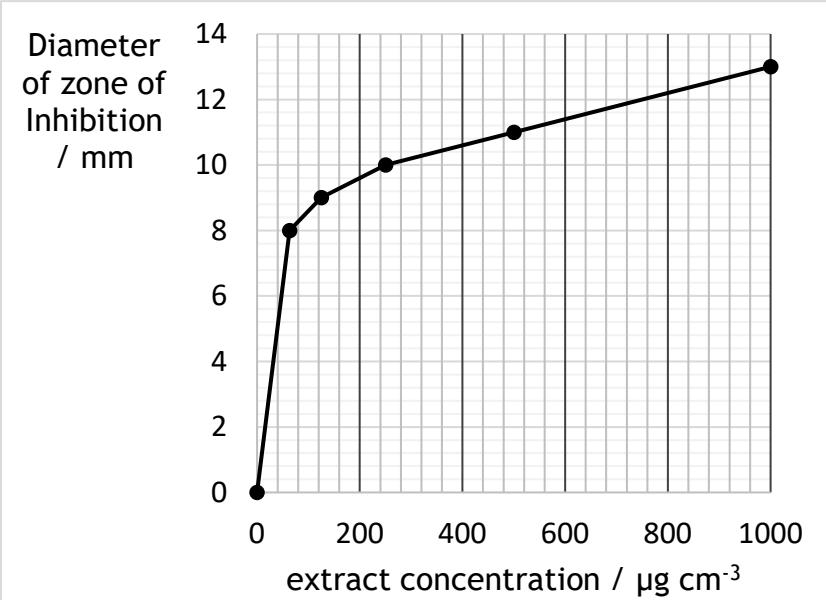
Question Number	Answer	Additional Guidance	Mark
1(a)(i)	A description that includes the following points : • powder seeds with {mortar and pestle / food processor} (1) • use a known mass of the (powdered) seeds (1) • use a known volume of ethanol (1) • the product (of this) is then filtered (1)	accept crush etc. accept other methods of crushing do not accept equal accept other words for known e.g. certain accept weigh seeds accept quoted mass ignore volume of seeds accept other words for known e.g. certain accept quoted volume do not accept water	**(3)**

Question Number	Answer	Additional Guidance	Mark
1(a)(ii)	A description that includes the following points : • suitable description of removing bacteria (from a culture) (1) • use of aseptic technique (1) • use of (glass) spreader to make lawn	accept a description of a suitable device e.g. rod, cotton bud, swab, needle, pipette, loop accept description e.g. sterile equipment used accept use of Bunsen to flame accept other feasible method, e.g. use of dissecting seeker	**(3)**

Question Number	Answer	Additional Guidance	Mark
1(a)(iii)	An explanation that includes the following points : • because body temperature is 37°C (1) • because 37°C is optimum for {enzymes / bacteria} (1)	ignore works best	**(2)**

Question Number	Answer	Additional Guidance	Mark
1(b)(i)	• Disc 1, 11 and Disc, 2 10 mm	Accept Disc 1, 10 and Disc 2, 9 mm	**(1)**

Question Number	Answer	Additional Guidance	Mark
1(b)(ii)	• add ethanol to this disc (and dry) (1)	do not accept water, solvent accept do not add extract to ethanol	**(1)**

Question Number	Answer	Additional Guidance	Mark
1(b)(iii)	A graph that includes the following features: • A axes correct (x – extract concentration, y- diameter of zone of inhibition) (1) • L all labels correct (x- extract concentration µg cm^{-3}/ Diameter of zone of Inhibition / mm) (1) • P plots correct on a linear scale on both axes (1) • S points joined with straight lines	 if have x axis as disc number no P mark but can have L if plot both ignore *S.typhi* if plot wrong one lose P bar chart loses S and P mark ignore plot antibiotic accept as correct if x axis goes from 1000 on the left ignore extrapolation	**(4)**

Question Number	Answer	Additional Guidance	Mark
1(b)(iv)	A description that includes three of the following points : • (both) bacteria are affected / *V. cholerae* is more affected than *S. typhi* (1) • as the concentration of extract increases the effectiveness increases / *S. typhi* unaffected below 500 (1) • antibiotic is more effective than the extract (1)	accept correct description of Z of I difference once accept reverse arguments accept works better or worse candidates will express this in various ways	**(3)**

Question Number	Answer	Additional Guidance	Mark
2(a)(i)	An answer that includes the following : • (Reducing sugars) Benedict's (test) (1) • (Starch) iodine (test) (1) • (Protein) biuret (test) (1)	accept Fehling's test ignore burette, buret etc	**(3)**

Question Number	Answer	Additional Guidance	Mark
2(a)(ii)	• any value between 41 and 49 (mg cm^{-3}) (1)	no credit for range	**(1)**

<table>
<tr><th>Question Number</th><th>Answer</th><th>Additional Guidance</th><th>Mark</th></tr>
<tr><td>2(a)(iii)</td><td>A calculation that includes the following steps:

• answer to a(ii) x 350 calculated (1)

• converted to grams and quoted to correct level of accuracy (1)</td><td>allow ECF

e.g. 45 x 350 = 15750 (mg)

accept to 2 or 3 sig figs
e.g. = 15.75, which is 16 to 2 sig figs or 15.8 to 3 sig figs

<table>
<tr><th>value quoted from 2aii</th><th>for 1 x 350</th><th>/1000</th><th>to 3 sig figs</th><th>to 2 sig figs</th></tr>
<tr><td>41</td><td>14350</td><td>14.35</td><td>14.4</td><td>14</td></tr>
<tr><td>42</td><td>14700</td><td>14.7</td><td>14.7</td><td>15</td></tr>
<tr><td>43</td><td>15050</td><td>15.05</td><td>15.1</td><td>15</td></tr>
<tr><td>44</td><td>15400</td><td>15.4</td><td>15.4</td><td>15</td></tr>
<tr><td>45</td><td>15750</td><td>15.75</td><td>15.8</td><td>16</td></tr>
<tr><td>46</td><td>16100</td><td>16.1</td><td>16.1</td><td>16</td></tr>
<tr><td>47</td><td>16450</td><td>16.45</td><td>16.5</td><td>16</td></tr>
<tr><td>48</td><td>16800</td><td>16.8</td><td>16.8</td><td>17</td></tr>
<tr><td>49</td><td>17150</td><td>17.15</td><td>17.2</td><td>17</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td></tr>
</table>
</td><td>(2)</td></tr>
</table>

Question Number	Answer	Additional Guidance	Mark
2(a)(iv)	A description that includes two of the following points: • A semi-quantitative test {gives an estimate (of the concentration of a substance) / involves judgment / is subjective} (1) • a quantitative test determines the exact value (of the concentration of a substance) (1)	accept rough ignore range subjective is not same as qualitative accept accurate, precise, objective ignore is a number	**(2)**

Question Number	Answer	Additional Guidance	Mark
2(b)(i)	• orange (with precipitate) (1)		**(1)**

Question Number	Answer	Additional Guidance	Mark
2(b)(ii)	An answer that includes the following points: • the carbohydrate content may include {non-reducing sugars / sucrose / starch / cellulose} (1)	accept other types of carbohydrate that are non-reducing, do not react with Benedict's reagent do not accept an example if contradictory, e.g non-reducing such as lactose	**(1)**

Question Number	Answer	Additional Guidance	Mark
2(b)(iii)	An answer that includes any **two pairs** from the following: Variety; • there is no (significant) difference (in resistant starch levels) between {the three / any two} varieties (1) • because the SDs overlap in all cases (1) Cooking method: • baking leads to (significantly) more (resistant) starch (than frying) (1) • because SDs do not overlap in any cases (1) Temperature: • potatoes served cold have (significantly more (resistant) starch (than those served hot) (1) • because SDs do not overlap (in all but 1 case) / (1)	accept 2 conclusions on one line for 2 marks accept reverse arguments accept baking destroys less RS than does frying serving cold destroys less RS than serving hot accept reverse argument for Red Norland	**(4)**

Question Number	Answer	Additional Guidance	Mark
2(c)(i)	A description that includes three of the following points : • 3 fatty acids (1) • (joined to) **a** glycerol (1) • by a condensation reaction(s) (1) • forming ester bonds (1)		**(3)**

Question Number	Answer	Additional Guidance	Mark
2(c)(ii)	An answer that includes one of the following points : • saturated fats have no double bonds {between carbons / in the hydrocarbon chain (of the fatty acid)} but unsaturated fats have (at least one) (1)	accept correct ref to ratio of C to H in both accept UnSat kinked chain Sat not kinked	**(1)**

Question Number	Answer	Additional Guidance	Mark
3(a)	An answer that includes one of the following points : • the protein is broken down to {amino acids / peptides} (1) • which are soluble (1)		**(1)**

Question Number	Answer	Additional Guidance	Mark
3(b)(i)	A table with the following features: • suitable table drawn (1) • column and row headings correct with units (1) • all data entered correctly with consistent use of decimal places (1)	<table><tr><th>substrate concentration / mmol dm^{-3}</th><th>Initial rate of reaction / au</th></tr><tr><td>0.0</td><td>0.0</td></tr><tr><td>0.1</td><td>5.0</td></tr><tr><td>0.2</td><td>7.5</td></tr><tr><td>0.4</td><td>9.0</td></tr><tr><td>0.8</td><td>9.5</td></tr><tr><td>1.6</td><td>9.5</td></tr></table>columns can be either way round	**(3)**

Question Number	Answer	Additional Guidance	Mark
3(b)(ii)	An explanation that includes two of the following points: • (because) substrate is in excess (relative to enzyme) (1) • (so) substrate concentration is not limiting (to reaction rate) / there are no end-products (to inhibit enzyme) (1) • to ensure that the {results are / investigation is} **valid** (1)	accept substrate concentration decreases as reaction proceeds. accept to allow **valid** comparisons (between different values of the IV)	**(2)**

Question Number	Answer	Additional Guidance	Mark
3(b)(iii)	An explanation that includes three of the following points: • initially the (initial) rate of reaction increases with increasing {substrate / protein} concentration and eventually the (initial) rate of reaction stopped increasing (1) • (it speeds because) there are more substrate molecules available {to collide with savinase / to form more ES complexes} (1) • (it levels off because) all the (enzyme) active sites are occupied (1)	do not accept "blow by blow" accounts accept enzyme for savinase ignore enzyme used up do not accept allow no more active site do not accept enzyme is limiting	**(2)**

Question Number	Answer	Additional Guidance	Mark
3(c)	An answer that includes 5 of the following points: 1. use a range of at least 5 temperatures that include 55°C and above and below 55°C (1) 2. equilibrate protein and enzyme solutions (to the temperature) before mixing (1) 3. control one variable (1) 4. mix the solutions and use colorimeter (1) 5. record {absorbance / transmission / readings} over time (1) 6. plot a graph of {absorbance / transmission / readings} against time (for each temperature) (1) 7. obtain initial rate of reaction from this graph (1) 8. safety issue discussed (1)	accept description ignore volume	**(5)**