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Mark Scheme (Results)

January 2015

Pearson Edexcel International Advanced Subsidiary Level in Biology (WBI03) Paper 01

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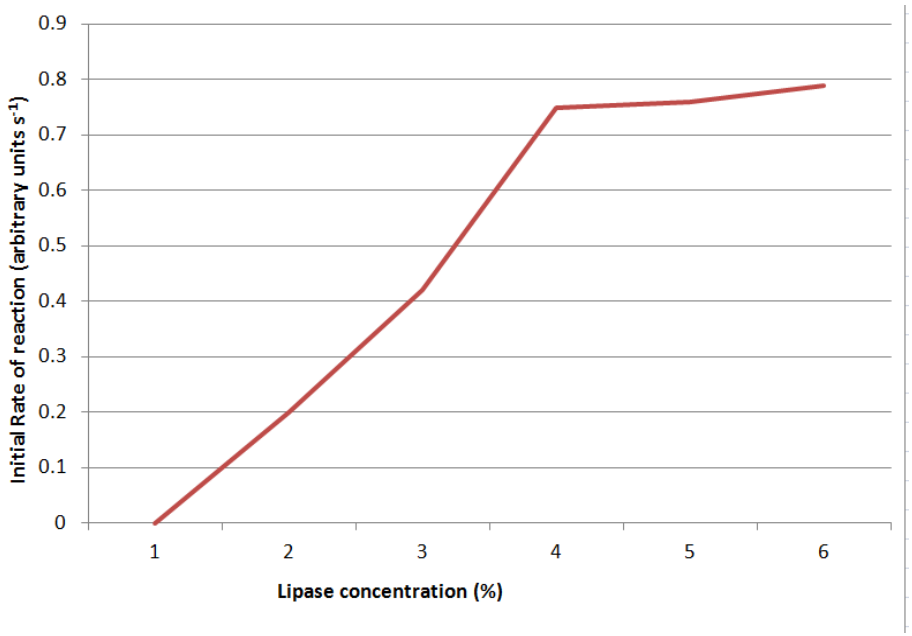
General Marking Guidance

- 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)	1. (temperature) 50 - 60°C ; 2. {temperature controlled / eq} water bath / eq ; 3. (pH) 9 ; 4. reference to buffer ;	**ACCEPT incubator/oven** **IGNORE temperature controlled room**	**(4)**

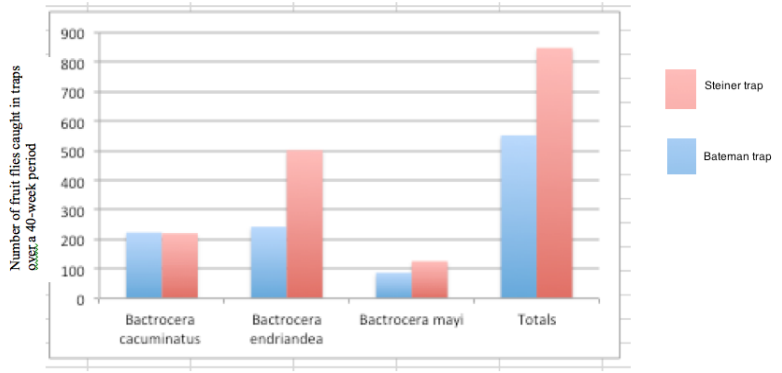
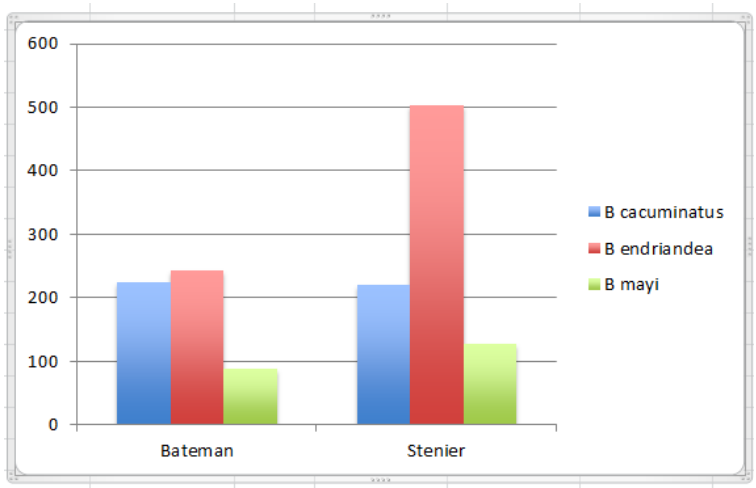
Question Number	Answer	Additional Guidance	Mark
1(a)(ii)	1. hot water / scalding risk, wear a lab coat / (heat resistant) gloves ; 2. (Bunsen) risk of burning, keep away from flame ; 3. alkaline solution risk to skin or eyes, wear goggles or gloves / lab coat / wash affected area immediately ; 4. skin contact allergy, wear gloves / lab coat / wash affected area immediately / use coated enzyme ; 5. inhalation allergy, wear mask / use coated enzyme ; 6. spillages, clean up immediately ; 7. ethanol is flammable, keep it away from naked flames		**(3)**

Question Number	Answer	Additional Guidance	Mark
1(b)	1. correct readings from the graph ; 2. calculation of rate ; 3. appropriate units e.g. a.u. per second ;	IGNORE number of decimal points 2. accept answer in the range 0.42 to 0.45 correct answer with units gains 3 marks	**(3)**

Question Number	Answer	Additional Guidance	Mark
1(c)(i)	A axes correct (x – enzyme concentration, y – rate) ; L axes correctly labelled: lipase concentration % and initial rate (of reaction) arbitrary units per second ; P correct plotting ; S suitable line ;	MAX 3 if either scale is non-linear or if graph uses less than half of the grid  **S accept points joined by straight lines or smooth curve**	**(4)**

Question Number	Answer	Additional Guidance	Mark
1(c)(ii)	1. more readings / repeat / need to know how many times it was repeated / eq ; 2. (idea of replication) under same conditions ; 3. standard deviation / standard error / range / eq ;		**(2)**

Question Number	Answer	Additional Guidance	Mark
1(c)(iii)	1. recommended enzyme concentration, 3% ; 2. idea that use of high concentrations of lipase is more expensive ; 3. idea of using concentration that produces biofuel fast enough / idea of little {increase / eq} above 3% ; 4. ref. to straight line part **and** levelling off ; 5. ref. to enzyme concentration limiting over straight line part ; 6. ref. to substrate concentration being limiting when levelled off ; 7. suitable manipulation of data to support any of the points made ;	7. e.g. rate of reaction increases by only 0.01 when enzyme concentration increases by 1.5 IGNORE manipulation if units are present and incorrect	**(4)**

Question Number	Answer	Additional Guidance	Mark
2(a)(i)	1. use of {bar / pie} chart ; 2. comparison between the two trap types ; 3. comparison between the three species ; 4. clear labelling ;	**1. ACCEPT suitable stacked bar chart**   **Candidates do not need to include totals**	**(4)**

Question Number	Answer	Additional Guidance	Mark
2(a)(ii)	7 / 8 / 9 ;	**ACCEPT 7 or 8 or 9**	**(1)**

Question Number	Answer	Additional Guidance	Mark
2(a)(iii)	1. idea that Steiner is better overall ; 2. Steiner better at catching two of the three species / {less / equally} effective for one of the species ; 3. idea of equal effectiveness for trapping *Bactrocera cacuminatus* ; 4. suitable manipulation of data to support any of the points made ;	1. **ACCEPT converse** e.g. 296 / 53.6% more flies caught with Steiner	**(4)**

Question Number	Answer	Additional Guidance	Mark
2(b)	1. release of sterile males ; 2. an explanation of how this reduces fruit fly population ;	2. e.g. (no fertilisation) therefore eggs cannot develop	**(2)**

Question Number	Answer	Additional Guidance	Mark
2(c)(i)	ENVIRONMENTAL IMPLICATION: 1. using insecticides ; 2. killing beneficial species / build up along food chains ; 3. problems of reducing fruit fly population / eq ; 4. e.g failure of orchid pollination so orchids become extinct ; 5. idea that this affects food chains ; ECONOMIC IMPLICATION : 6. idea of increased costs or loss of income ; 7. Perspex expensive ; 8. labour costs ; 9. fewer orchids or more fruit to sell ;	**Max 3 marks for either environmental implication or economic implication**	**(4)**

Question Number	Answer	Additional Guidance	Mark
2(c)(ii)	1. increased income / eq ; 2. more money for {education / health / eq} ; OR 3. more food produced / eq ; 4. {better nutrition / e.g} / better health / more employment / eq ;	**mark points 1 and 2 or 3 and 4 are awarded in pairs**	**(2)**

Question Number	Answer	Additional Guidance	Mark
2(d)	1. date of {publication / paper} ; 2. article title ; 3. title of journal ; 4. further detail about journal {e.g. volume number / part number / pages }	IGNORE url of website	**(3)**

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