Mark scheme

<table>
<tr><th colspan="3">Question</th><th>Answer/Indicative content</th><th>Marks</th><th>Guidance</th></tr>
<tr><td>1</td><td>a</td><td></td><td>
<table>
<tr><th></th><th>Number of pesticide resistant insects</th><th>Number of pesticide sensitive insects</th><th>Ratio</th></tr>
<tr><td>At the end</td><td>4</td><td>2</td><td>2 : 1</td></tr>
</table>
✓ ✓
</td><td>2
(AO 2.2)
(AO 1.2)</td><td>ALLOW 4 : 2

<u>Examiner’s Comments</u>

This question was answered well, with most candidates gaining the full 2 marks.</td></tr>
<tr><td></td><td>b</td><td></td><td>Natural selection ✓</td><td>1
(AO 2.1)</td><td><u>Examiner’s Comments</u>

Approximately half of all candidates correctly selected natural selection. The most commonly seen incorrect response was genetic engineering.</td></tr>
<tr><td></td><td>c</td><td></td><td>Pesticides kill pests/insects ✓

The pests/insects may become resistant ✓</td><td>2
(2 x AO 3.1a)</td><td>ALLOW idea that may deter them from using pesticide

ALLOW may choose alternative named methods / alternative pesticide/ become organic farmers

<u>Examiner’s Comments</u>

This question proved to be found quite tricky by candidates. Where candidates had recognised that it was natural selection in the previous question, they generally gained at least 1 mark on this question, recognising that some of the insects became resistant to the pesticide, and/or that the farmers would need to find an alternative pesticide. When an incorrect response was selected in Question 17 (b), then candidates often</td></tr>
</table>

					went down the wrong path with their responses to this question.
			Total	**5**	
2			B	1 (AO 1.1)	**Examiner's Comments** This was answered correctly by the majority of candidates, with the most commonly seen incorrect response being A.
			Total	**1**	
3		i	All points correctly plotted ✓ ✓	2 (2 xAO 2.2)	3 points correct = 1 mark **ALLOW** +/− half a square **DO NOT ALLOW** a bar graph **Examiner's Comments** The majority of candidates were able to correctly plot all 4 points. Where only 1 mark was scored, it was due to the first point being plotted incorrectly.
		ii	Line of best fit ✓	1 (AO 2.2)	**ALLOW** ECF from incorrect points plotted **IGNORE** extrapolations **Examiner's Comments** The majority of candidates were able to draw a suitable line of best fit. Where candidates didn't score this mark it was generally for the following reasons: they did not use a ruler, their line was too thick, or they had multiple lines.
		iii	A figure in range of 1.55-1.7 ✓	1 (AO 2.2)	**ALLOW** ECF figure from candidate's graph **Examiner's Comments** More than half of all candidates were able to use their line of best fit to make a prediction.
		iv	**Any two from:** Less chance of mutations ✓ Less likely to get cancer/tumours ✓	2 (2 xAO 1.1)	**ALLOW** uncontrolled growth causes cancer/tumours

			Cancer/tumours can spread / be lethal ✓		**ALLOW** malignant **Examiner's Comments** This question was one of the more challenging questions for the majority of candidates, with candidates not making the link between uncontrolled cell growth and tumours/cancer. Most candidates who were credited marks tended to only gain 1 mark on this question, for stating that mole rats were less likely to get mutations, or less likely to get cancer.
			Total	**6**	
4			**C**	1 (AO 1.1)	**Examiner's Comments** Answered correctly by majority of candidates.
			Total	**1**	
5			**B**	1 (AO 1.1)	**Examiner's Comments** Over half of all candidates answered this correctly.
			Total	**1**	
6		i	D C B A E	3 (3 × AO 2.1)	D before C ✓ C before B ✓ B before A ✓ **Examiner's Comments** The majority of candidates scored 2 or full marks on this natural selection question showing the correct order.
		ii	(Charles) Darwin ✓	1 (AO 1.1)	**ALLOW** Wallace **Examiner's Comments** Over half the candidates correctly identified Darwin as the scientist who published a book describing the theory of natural selection. Most candidates who did not gain this mark did not answer with a no response.
			Total	**4**	