

# Mark Scheme (Results)

Summer 2015

Pearson Edexcel GCSE in  
Biology (5BI3F/01)  
Unit 3: Using Biology

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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.
- For questions worth more than one mark, the answer column shows how partial credit can be allocated. This has been done by the inclusion of part marks eg (1).
- 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.

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## **Quality of Written Communication**

Questions which involve the writing of continuous prose will expect candidates to:

- Write legibly, with accurate spelling, grammar and punctuation in order to make the meaning clear
- Select and use a form and style of writing appropriate to purpose and to complex subject matter
- Organise information clearly and coherently, using specialist vocabulary when appropriate.

Question Number	Answer	Acceptable answers	Mark
<b>1(a)(i)</b>	7 (pecks)		<b>(1)</b>

Question Number	Answer	Acceptable answers	Mark
<b>1(a)(ii)</b>	<p><b>A description including two of the following:</b></p> <p>(spot) colour affects number of pecks (1)</p> <p>indication of preference for a specific colour (1)</p> <p>use of figures from table (1)</p>	<p>darker the spot, more pecks</p> <p>black has the most pecks grey has second highest number of pecks no spot has the least pecks grey has less than black / more than no spot</p> <p>black (14) has twice as many pecks as grey (7)</p>	<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>1(a)(iii)</b>	<b>C</b> <input checked="" type="checkbox"/> innate		<b>(1)</b>

Question Number	Answer	Acceptable answers	Mark
<b>1(a)(iv)</b>	(red spot gull) would receive the most pecks / other colours will receive fewer pecks		<b>(1)</b>

Question Number	Answer	Acceptable answers	Mark
<b>1(b)</b>	<p><b>A suggestion linking two of the following</b></p> <p>a need for food (1)</p> <p>food availability (1)</p> <p>habituation/learned behaviour (1)</p>	<p>to feed young/ hungry</p> <p>lots of food around/on beach/easy to get</p> <p>they are not afraid of humans</p>	<b>(2)</b>

**Total for Question 1 = 7 marks**

Question Number	Answer	Acceptable answers	Mark
<b>2(a)(i)</b>	140 (÷) 350 (1) 40 (%)	two marks for correct answer	<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>2(a)(ii)</b>	higher resistance to disease / fewer potatoes with the disease		<b>(1)</b>

Question Number	Answer	Acceptable answers	Mark
<b>2(a)(iii)</b>	more potatoes harvested / larger yield		<b>(1)</b>

Question Number	Answer	Acceptable answers	Mark
<b>2(b)</b>	<b>D</b> ☒ pathogens		<b>(1)</b>

Question Number	Answer	Acceptable answers	Mark
<b>2(c)</b>	(some potatoes/varieties) are resistant to /produce chemicals against pathogens	Reject immune  Ignore larger crop so more affected Ignore environmental factors	<b>(1)</b>

Question Number	Answer	Acceptable answers	Mark
<b>2(d)</b>	<p>An explanation linking the following</p> <p>produced in a fermenter (1)</p> <p>rapid growth / independent of environment (1)</p> <p>OR</p> <p>type of food eg low in fat / low in cholesterol / high in protein / high in fibre (1)</p> <p>health benefits eg reduced risk of heart disease / suitable for vegetarians / eq (1)</p>	<p>Ignore easy/cheap to produce</p>	<b>(2)</b>

Total for Question 2 = 8 marks

Question Number	Answer	Acceptable answers	Mark
<b>3(a)(i)</b>	<b>B</b> <input checked="" type="checkbox"/> oestrogen		<b>(1)</b>

Question Number	Answer	Acceptable answers	Mark
<b>3(a)(ii)</b>	<b>C</b> <input checked="" type="checkbox"/> day 14		<b>(1)</b>

Question Number	Answer	Acceptable answers	Mark
<b>3(b)</b>	<b>An explanation including the following</b>  the cell <u>membrane</u> changes (1)  blocking entry of more sperm (1)	Accept hardens/thickens	<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>3(c)</b>	<b>An explanation linking the following</b>  acrosome (1)  contains enzymes (1)  <b>OR</b>  nucleus (1)  haploid /containing one set of genetic information (1)  <b>OR</b>  mitochondria (1)  respiration/to release energy (for swimming) (1)	half the genetic information allow 23	<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>3(d)(i)</b>	liver  amino acids  glomerulus	Must be in the correct order	<b>(3)</b>

Question Number	Answer	Acceptable answers	Mark
<b>3(d)(ii)</b>	<p><b>An explanation linking two of the following</b></p> <p>(selectively) re-absorbed (1)</p> <p>(back) into blood (1)</p> <p>in the convoluted tubule (1)</p>		<b>(2)</b>

Total for Question 3 = 11 marks



Question Number	Answer	Acceptable answers	Mark
<b>4(a)</b>	<b>A</b> ☒		<b>(1)</b>

Question Number	Answer	Acceptable answers	Mark
<b>4(b)</b>	<p><b>A description including two of the following</b></p> <p>determine level in / age of strata (1)</p> <p>using dates of associated artefacts/fossils/buildings (1)</p> <p>carbon dating of organic artefacts (1)</p> <p>reference to design/manufacture (1)</p>	<p>compare with similar tools of known dates</p> <p>axe handles, bindings, cloth</p>	<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>4(c)</b>	<p>million</p> <p>Ardi</p>	<b>Must be in the correct order</b>	<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>4(d)</b>	<p><b>A suggestion linking the following</b></p> <p>temperature dropped/ice age (1)</p> <p>sea froze (1) OR lower sea level (1)</p> <p>no gap (1) OR narrower gap (1)</p> <p>migrate/travel/walk across (1)</p>	Ignore continental drift	<b>(3)</b>

Question Number	Answer	Acceptable answers	Mark
<b>4(e)</b>	<b>any two from</b> sound (1) chemical signals (1) visual signals (1)	examples of sound examples of chemical signals examples of visual signals	<b>(2)</b>

Total for Question 4 = 10 marks

Question Number	Answer	Acceptable answers	Mark
<b>5(a)(i)</b>	<p><b>An explanation including the following</b></p> <p>breaks down the lactose / produces lactose free milk (1)</p> <p>suitable for people with a lactose intolerance (1)</p>		<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>5(a)(ii)</b>	<p><b>A suggestion linking the following</b></p> <p>allows the enzyme to be reused (1)</p> <p>stops the enzymes contaminating the milk / reduces need to purify the product (1)</p>		<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>5(b)</b>	<p><b>A description including two of the following:</b></p> <p>breaks down sucrose (1)</p> <p>into fructose / glucose (1)</p> <p>more liquid consistency /soft centred sweets (1)</p>		<b>(2)</b>

Question Number		Indicative Content	Mark
<b>QWC</b>	<b>*5(c)</b>	<p><b>A description to include some of the following points</b></p> <p>pasteurisation</p> <ul style="list-style-type: none"> <li>• heat the milk</li> <li>• to 72°C / high temperature</li> <li>• to remove unwanted micro organisms</li> </ul> <p>inoculation</p> <ul style="list-style-type: none"> <li>• add bacteria</li> <li>• <i>Lactobacillus/</i> named bacteria</li> <li>• start fermentation process</li> </ul> <p>incubation</p> <ul style="list-style-type: none"> <li>• incubate at suitable temperature</li> <li>• bacteria multiply</li> <li>• bacteria convert lactose</li> <li>• into lactic acid</li> <li>• reduces the pH</li> <li>• thickens milk</li> </ul>	<b>(6)</b>
<b>Level</b>	<b>0</b>	No rewardable content	
<b>1</b>	<b>1 - 2</b>	<ul style="list-style-type: none"> <li>• a limited description of one stage involved in the production of yogurt.</li> <li>• the answer communicates ideas using simple language and uses limited scientific terminology</li> <li>• spelling, punctuation and grammar are used with limited accuracy</li> </ul>	
<b>2</b>	<b>3 - 4</b>	<ul style="list-style-type: none"> <li>• a simple description of at least two stages OR a detailed description of incubation.</li> <li>• the answer communicates ideas showing some evidence of clarity and organisation and uses scientific terminology appropriately</li> <li>• spelling, punctuation and grammar are used with some accuracy</li> </ul>	
<b>3</b>	<b>5 - 6</b>	<ul style="list-style-type: none"> <li>• a detailed description that includes all three stages involved in the production of yogurt.</li> <li>• the answer communicates ideas clearly and coherently uses a range of scientific terminology accurately</li> <li>• spelling, punctuation and grammar are used with few errors</li> </ul>	

Total for Question 5 = 12 marks

Question Number	Answer	Acceptable answers	Mark
<b>6(a)(i)</b>	<b>A</b> <input checked="" type="checkbox"/> ethanol		<b>(1)</b>

Question Number	Answer	Acceptable answers	Mark
<b>6(a)(ii)</b>	renewable (1) carbon neutral (1)	sustainable carbon dioxide used up in growth / description	<b>(2)</b>

Question Number	Answer	Acceptable answers	Mark
<b>6(b)</b>	<b>An explanation linking three of the following</b> greater demand for food (1) not enough food produced (1) alternative use of (farm)land (1) social reasons / wars / poverty (1)	biofuel production/housing	<b>(3)</b>

Question Number		Indicative Content	Mark
<b>QWC</b>	<b>*6(c)</b>	<p><b>An explanation to include some of the following points</b></p> <p>new plant varieties:</p> <ul style="list-style-type: none"> <li>• selection of best varieties/species</li> <li>• selective breeding</li> <li>• cloning</li> <li>• example (pest resistance/environmental tolerance)</li> </ul> <p>genetic modification:</p> <ul style="list-style-type: none"> <li>• addition of genes</li> <li>• to improve characteristics</li> <li>• by <i>Agrobacterium tumefaciens</i>/vector</li> <li>• example (flavonoids/bio-fortification/pest resistance)</li> </ul> <p>pest control:</p> <ul style="list-style-type: none"> <li>• use of pesticides</li> <li>• biological control</li> <li>• reference to reduction in loss (due to pest)</li> </ul>	<b>(6)</b>
<b>Level</b>	<b>0</b>	No rewardable content	
<b>1</b>	<b>1 - 2</b>	<ul style="list-style-type: none"> <li>• a limited explanation of one method of increasing food production.</li> <li>• the answer communicates ideas using simple language and uses limited scientific terminology</li> <li>• spelling, punctuation and grammar are used with limited accuracy</li> </ul>	
<b>2</b>	<b>3 - 4</b>	<ul style="list-style-type: none"> <li>• a simple explanation of two methods OR a detailed explanation of one method of increasing food production.</li> <li>• the answer communicates ideas showing some evidence of clarity and organisation and uses scientific terminology appropriately</li> <li>• spelling, punctuation and grammar are used with some accuracy</li> </ul>	
<b>3</b>	<b>5 - 6</b>	<ul style="list-style-type: none"> <li>• a detailed explanation of at least two methods OR an explanation with points from all three methods of increasing food production.</li> <li>• the answer communicates ideas clearly and coherently uses a range of scientific terminology accurately</li> <li>• spelling, punctuation and grammar are used with few errors</li> </ul>	

**Total for Question 6 = 12 marks**

