

Mark Scheme (Results)

Summer 2016

Pearson Edexcel GCSE  
in Biology (5BI1F) Paper 01  
Unit B1: Influences on Life

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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.

## 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.

Full marks will be awarded if the candidate has demonstrated the above abilities.

Questions where QWC is likely to be particularly important are indicated (QWC) in the mark scheme, but this does not preclude others.

Question number	Answer	Notes	Marks
1 (a)	<b>C</b> Prokaryotes		(1)

Question number	Answer	Notes	Marks
1 (b)(i)	<b>A</b> autotrophs		(1)

Question number	Answer	Notes	Marks
1 (b)(ii)	photosynthesis	Allow any recognisable spelling	(1)

Question number	Answer	Notes	Marks
1 (c) (i)	42/43 to 80 (°C) OR 38/37 (°C)		(1)

Question number	Answer	Notes	Marks
1 (c) (ii)	Any response in the range: 66 to 70 (°C)		(1)

Question number	Answer	Notes	Marks
1 (c) (iii)	<p>A description including three of the following:</p> <ul style="list-style-type: none"> <li>• hot / high temperatures (1)</li> <li>• high pressure (1)</li> <li>• dark (1)</li> <li>• sulphurous / acidic (1)</li> <li>• saline / salty (1)</li> </ul>	<p>lack of sunlight</p> <p>accept low / lack of oxygen</p>	(3)

**Total marks for question 1 – 8 marks**

Question number	Answer	Notes	Marks
2 (a) (i)	50%	$\frac{1}{2}$ Half 0.50	(1)

Question number	Answer	Notes	Marks
2 (a) (ii)	Chris – ff / homozygous recessive (1) Megan – FF / homozygous dominant (1)		(2)

Question number	Answer	Notes	Marks
2 (a) (iii)	An explanation to include the following: <ul style="list-style-type: none"> <li>• (both) parents are heterozygous (1)</li> <li>• each parent passes one recessive allele / child will have has two recessive alleles (1)</li> </ul>	accept Ff / carriers  accept ff	(2)

Question number	Answer	Notes	Marks
2 (b)	<p>A description to include the following:</p> <ul style="list-style-type: none"> <li>• sticky mucus / build up of mucus (1)</li> </ul> <p>Any <b>two</b> from the following:</p> <ul style="list-style-type: none"> <li>• breathing difficulties (1)</li> <li>• (increase) risk of infection (1)</li> <li>• weight loss (1)</li> <li>• infertility (1)</li> <li>• fatigue / tiredness (1)</li> </ul>	<p>accept explanations of how symptoms arise eg blocked pancreatic duct as alternatives to symptom</p>	(3)

(Total for Question 2 = 8 marks)

Question number	Answer	Notes	Marks
3 (a) (i)	<p><b>A</b> – nucleus (1)</p> <p><b>B</b> - myelin (sheath) (1)</p>	Accept cell body	(2)

Question number	Answer	Notes	Marks
3 (a) (ii)	<p>A description to include the following:</p> <ul style="list-style-type: none"> <li>• <u>insulation</u> (of the axon) (1)</li> <li>• increase the speed of the impulse / transmission (1)</li> </ul>		(2)

Question number	Answer	Notes	Marks
3 (b)	<b>A</b> as electrical impulses		(1)

Question number	Answer	Notes	Marks
3 (c) (i)	<p>30(%) and 1(%) (1)</p> <p>29(%)</p>	2 marks for correct answer	(2)



Question number	Answer	Notes	Marks
3 (c) (ii)	<p>An explanation linking <b>two</b> of the following:</p> <ul style="list-style-type: none"> <li>• (alcohol is a <u>depressant</u> (1)</li> <li>• slower speed of reaction / increases time it takes to react / increases reaction time (1)</li> <li>• impairs judgement / loss of inhibitions (1)</li> </ul>		(2)

Question number	Answer	Notes	Marks
3 (d)	<p>An explanation linking:</p> <ul style="list-style-type: none"> <li>• brain not used (1)</li> <li>• automatic / involuntary (1)</li> </ul>	accept do not have to think about it	(2)

**(Total for Question 3 = 11 marks)**

Question number	Answer	Notes	Marks
4 (a)	$1.5 \times 1.5 / 1.5^2 / 2.25$ (1) $90 / 2.25 = 40$	2 marks for correct answer	(2)

Question number	Answer	Notes	Marks
4 (b) (i)	insulin		(1)

Question number	Answer	Notes	Marks
4 (b) (ii)	<b>D</b> pancreas		(1)

Question number	Answer	Notes	Marks
4 (b) (iii)	A description to include the following <ul style="list-style-type: none"> <li>• exercise / physical activity (1)</li> <li>• reduce carbohydrate intake (1)</li> </ul>	accept diet control	(2)

Question number	Answer	Notes	Marks
4 (c) (i)	<p>A description to include the following:</p> <ul style="list-style-type: none"> <li>• (injection of) insulin (1)</li> <li>• into a fat layer (1)</li> </ul>		(2)

Question number	Answer	Notes	Marks
4 (c) (ii)	<b>D</b> glycogen		(1)

(Total for Question 4 = 9 marks)

Question number	Answer	Notes	Marks
5 (a) (i)	C pathogen		(1)

Question number	Answer	Notes	Marks
5 (a) (ii)	<p>An explanation including the following:</p> <ul style="list-style-type: none"> <li>not considered to be living (1)</li> <li>does not complete (all) life processes (independently) (1)</li> </ul>	accept examples of life processes	(2)

Question number	Answer	Notes	Marks
5 (a) (iii)	HIV / AIDS / sexually transmitted diseases	accept other diseases passed by bodily fluids	(1)

Question number	Answer	Notes	Marks
5 (b)	<p>A description to include the following:</p> <ul style="list-style-type: none"> <li>used externally / on surfaces / onto the skin (1)</li> <li>kills pathogen(s) / microorganisms (1)</li> </ul>		(2)

Question Number	Indicative Content	Mark
<b>QWC</b>	<p><b>*5c</b></p> <p>A description to include some of the following points:</p> <p>Physical barriers</p> <ul style="list-style-type: none"> <li>• skin to prevent entry of organisms into the bloodstream</li> <li>• cilia lining the nasal passages / bronchi to prevent entry to lungs / remove mucus</li> <li>• mucus to trap pathogens</li> <li>• scabs to prevent entry of microorganisms into the bloodstream</li> <li>• eyelashes prevent entry into the eye</li> <li>• nasal hairs trap organisms entering breathing system</li> <li>• ear wax traps organisms</li> </ul> <p>Chemical defences</p> <ul style="list-style-type: none"> <li>• (hydrochloric) acid in the stomach kills organisms</li> <li>• lysozymes / enzymes in tears kill organisms</li> <li>• sebum on skin (antibacterial) kills organisms</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 either a physical barrier OR a chemical defence</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 both a physical barrier AND a chemical defence OR a detailed description of one</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 of both a physical barrier AND a chemical defence</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	Notes	Marks
6 (a) (i)	21 (%) (1) 105	2 marks for correct answer	(2)

Question number	Answer	Notes	Marks
6 (a) (ii)	An explanation to include the following: <ul style="list-style-type: none"> <li>(tobacco smoke contains) tar (1)</li> <li>(which is a <u>carcinogen</u>) (1)</li> </ul>	can cause mutations	(2)

Question number	Answer	Notes	Marks
6 (a) (iii)	An explanation to include the following: <ul style="list-style-type: none"> <li>(tobacco smoke contains) carbon monoxide (1)</li> <li>reduces how much oxygen can be carried to the muscles / binds to red blood cells / reduces oxygen carrying capacity (1)</li> </ul>	less oxygen in blood	(2)

Question Number		Indicative Content	Mark
<b>QWC</b>	<b>*6(b)</b>	<p>A description to include some of the following points:</p> <ul style="list-style-type: none"> <li>• drugs are chemical substances that affects the CNS causing a change in behaviour and can be addictive</li> </ul> <p>Stimulants</p> <ul style="list-style-type: none"> <li>• increase neurone speed / neurotransmission</li> <li>• across synapses</li> <li>• speed up reaction time / decrease reaction time</li> <li>• example includes caffeine / cocaine</li> </ul> <p>Depressants</p> <ul style="list-style-type: none"> <li>• decrease neurone speed / neurotransmission</li> <li>• across synapse / brain activity</li> <li>• slow down reaction time / increase reaction time</li> <li>• example includes alcohol</li> </ul> <p>Painkillers</p> <ul style="list-style-type: none"> <li>• feel less pain from a damaged body area</li> <li>• reduce nerve impulses being received by the brain</li> <li>• blocking synapses</li> <li>• example includes morphine / paracetamol</li> </ul> <p>Hallucinogens</p> <ul style="list-style-type: none"> <li>• affects synapses in the brain altering perception</li> <li>• sight / hearing / touch can be changed</li> <li>• example includes LSD / acid / magic mushrooms / cannabis</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 at least one group of drugs OR a definition of a drug</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 groups of drugs OR a detailed description of one group of drugs including the effects on the nervous system</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 of the effects of at least three groups of drugs including the effects on the nervous system</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)**

