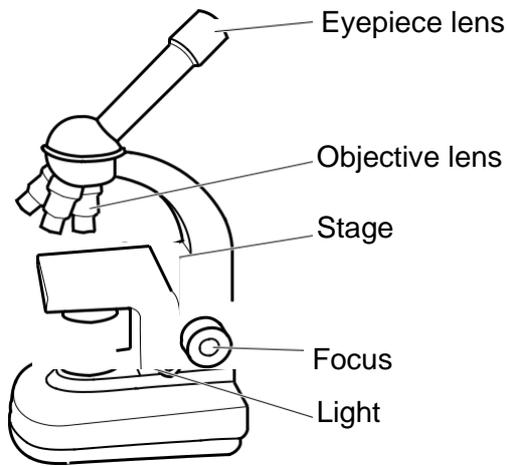


(b) Light microscopes can be used to observe bacteria.

Here is a labelled diagram of a light microscope:



Complete the sentences to describe how to use the microscope to observe bacteria on a slide.

Use words from the labelled microscope.

Place the slide on the

Turn on the so the image is as bright as possible.

Turn the into position above the slide.

Adjust the until the image is as clear as possible.

[4]

(c) Which of the following infections is caused by bacteria?

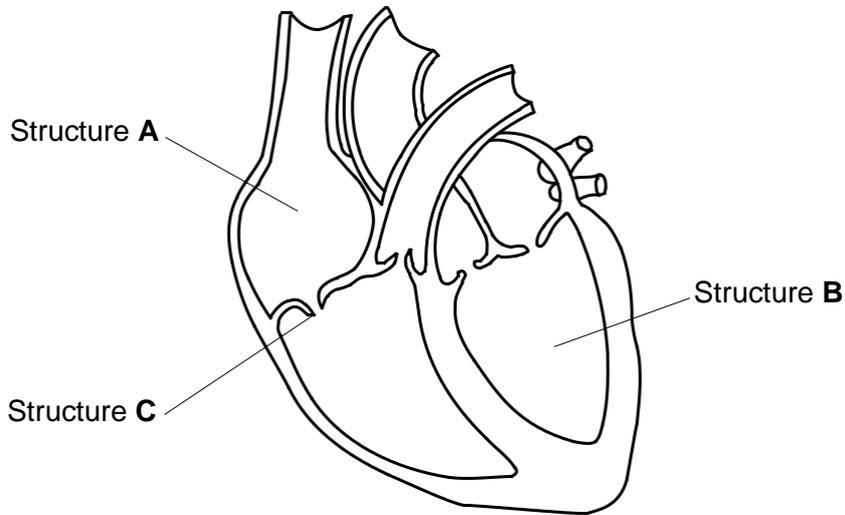
Tick (✓) **one** box.

- Athlete's foot
- Influenza
- Malaria
- Salmonella food poisoning

[1]

4 The heart, blood vessels and blood make up the circulatory system.

(a) The diagram shows a human heart.



Draw lines to connect each **structure** with its correct **name**.

Structure	Name
A	Atrium
B	Valve
C	Ventricle

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[2]

(b) Which diagram correctly describes the route followed by blood through the circulatory system?

Tick (✓) **one** box.

<div style="border: 1px solid black; padding: 5px; display: inline-block;"> → Heart → Heart → Body → Lungs → </div>	<input type="checkbox"/>
<div style="border: 1px solid black; padding: 5px; display: inline-block;"> → Heart → Lungs → Body → Heart → </div>	<input type="checkbox"/>
<div style="border: 1px solid black; padding: 5px; display: inline-block;"> → Heart → Lungs → Heart → Body → </div>	<input type="checkbox"/>

[1]

5 Wheat and sunflowers are important food crops.

(a) The population of the world is 8 billion people.

3.2 billion people eat food made from wheat as a major part of their diet.

What percentage of the world's population is this?

Answer = % [2]

(b) Parts of the world where crops are grown are getting warmer and drier because of climate change.

A gene called HB4 enables plants to grow in warmer, drier conditions.

Sunflowers have this gene.

(i) Which statement explains what a gene is?

Tick (✓) **one** box.

A characteristic of an organism.

A section of DNA that contains instructions.

Part of a cell that contains chromosomes.

The entire genetic material of an organism.

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[1]

(ii) Cells need genes to make which substances?

Put a ring around the correct answer.

carbohydrates **fats** **mineral ions** **proteins**

[1]

(iii) Wheat does **not** grow well in warmer, drier conditions.

Scientists have transferred the HB4 gene from sunflowers into wheat.

Describe the effects on the wheat of modifying it in this way.

.....
.....
.....
..... [2]

12. Abbreviations, annotations and conventions used in the detailed Mark Scheme (to include abbreviations and subject -specific conventions).

Annotation	Meaning
/	alternative and acceptable answers for the same marking point
✓	Separates marking points
DO NOT ALLOW	Answers which are not worthy of credit
IGNORE	Statements which are irrelevant
ALLOW	Answers that can be accepted
()	Words which are not essential to gain credit
—	Underlined words must be present in answer to score a mark
ECF	Error carried forward
AW	Alternative wording
ORA	Or reverse argument

Question		Answer	Marks	AO element	Guidance																				
3	(a)	<table border="1"> <thead> <tr> <th></th> <th>Only true for hormones</th> <th>Only true for nerve impulse</th> <th>True for both</th> </tr> </thead> <tbody> <tr> <td>Are secreted by glands</td> <td>✓</td> <td></td> <td></td> </tr> <tr> <td>Travel along neurons</td> <td></td> <td>✓</td> <td></td> </tr> <tr> <td>Travel in the blood</td> <td>✓</td> <td></td> <td></td> </tr> <tr> <td>Usually cause slower, longer lasting responses</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>		Only true for hormones	Only true for nerve impulse	True for both	Are secreted by glands	✓			Travel along neurons		✓		Travel in the blood	✓			Usually cause slower, longer lasting responses				4	1.1	
	Only true for hormones	Only true for nerve impulse	True for both																						
Are secreted by glands	✓																								
Travel along neurons		✓																							
Travel in the blood	✓																								
Usually cause slower, longer lasting responses																									
	(b)	<p>Any three from:</p> <p>hormones taken as a pill / implant / injected ✓</p> <p>idea that the contraceptive disrupts/affects the <u>menstrual cycle/hormones</u> ✓</p> <p>prevents/controls ovulation ✓</p> <p>prevents release of an egg ✓</p> <p>other mechanisms, e.g. prevents maturation of an egg / causes mucus around cervix ✓</p> <p>no egg present so cannot be fertilised ✓</p>	3	1.1	<p>ALLOW credit for higher level ideas e.g. effects of/on named hormones</p> <p>ALLOW ref. to male pill disrupting production of sperm</p> <p>DO NOT ALLOW ref. to thickening the uterus lining, as this does not prevent fertilisation</p>																				

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Question		Answer				Marks	AO element	Guidance
7	(a)		Only aerobic	Only anaerobic	Both	4	1.1	
		Is exothermic			✓			
		Produces lactic acid		✓				
		Requires glucose			✓			
		Requires oxygen	✓					
(b)	more than	✓			1	1.1		

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