AQA GCSE Combined Science - Trilogy | 8464

SPECIFICATION POINT 4.3.1.1

# Communicable (infectious) diseases

## Past-paper questions

| | |
|---|---|
| Tier | **Higher** |
| Question groups | **8** |
| Available paper years | **2018–2025** |

## Using this booklet

1. Answer the questions in order and show your working.
2. Original question numbers and marks are retained.
3. Print at actual size (100%) for measuring questions.
4. Use the companion answer booklet to check your work.

**Name:** _____ **Date:** _____

Whole questions are retained for context, so some parts assess other specification points. Current and legacy sources are labelled. Continue on extra paper if needed.

### 4.3.1.1 Communicable (infectious) diseases

**Question 01**

June 2018 | 8464/B/1H | Original Q2

**0 2** Coronary heart disease (CHD) is a non-communicable disease.

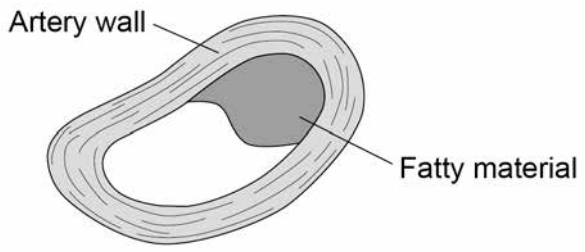
CHD is caused when fatty material builds up in the coronary arteries.

**0 2 . 1** Explain what a non-communicable disease is.

**[2 marks]**

**Figure 4** shows a coronary artery of someone with CHD.

**Figure 4**




**0 2 . 2** Explain how CHD can cause a heart attack.

**[3 marks]**

### 4.3.1.1 Communicable (infectious) diseases

**Question 01 · continued**



**0 2 . 3** Explain how lifestyle and medical risk factors increase the chance of developing CHD.
**[6 marks]**

**11**

### 4.3.1.1 Communicable (infectious) diseases

**Question 02**



**0 4** Pathogens are microorganisms that cause infectious diseases.

**0 4 . 1** What type of pathogen causes malaria?

**[1 mark]**

Tick (✓) **one** box.

- Bacterium ☐
- Fungus ☐
- Protist ☐
- Virus ☐

**0 4 . 2** Give **two** methods used to prevent people catching malaria.

Give a reason why each method works.

**[4 marks]**

Method 1 _____

_____

Reason _____

_____

_____

Method 2 _____

_____

Reason _____

_____

_____

4.3.1.1 Communicable (infectious) diseases

Question 02 · continued



**0 4 . 3** Describe **two** differences between a bacterial cell and a eukaryotic cell.

**[2 marks]**

1 _____

_____

_____

2 _____

_____

_____

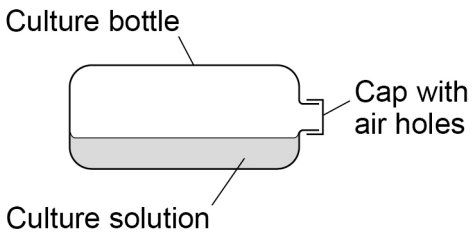
A scientist investigated the population growth of bacteria in a culture solution.

At the start of the investigation the culture solution contained all the nutrients the bacteria needed.

The scientist determined the number of living bacterial cells in the solution every hour over two days.

**Figure 5** shows the apparatus used.

**Figure 5**




**0 4 . 4** Describe why there are air holes in the cap of the culture bottle.

**[1 mark]**

_____

_____

**Question 4 continues on the next page**

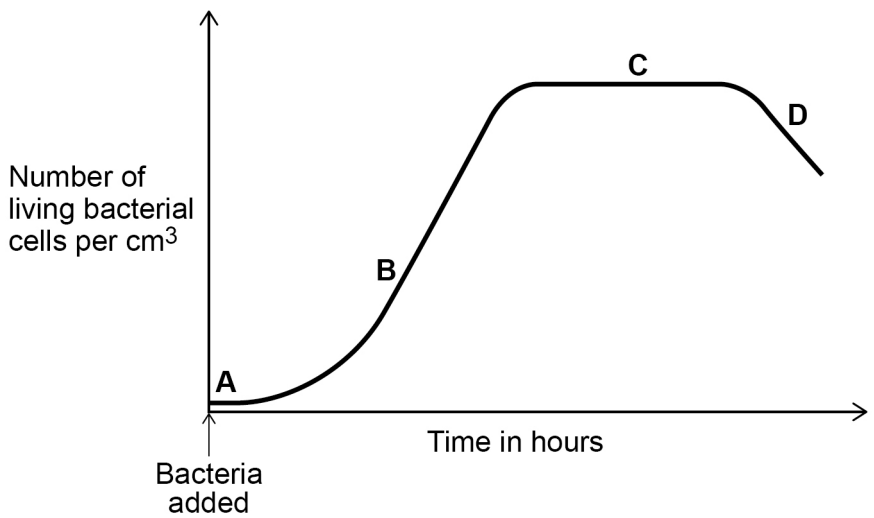
4.3.1.1 Communicable (infectious) diseases

Question 02 · continued



**Figure 6** shows the scientist's results.

**Figure 6**




**0 4 . 5** Give **one** reason for what is happening to the number of bacteria at each of the stages.

**[4 marks]**

Stage **A** _____

_____

_____

Stage **B** _____

_____

_____

Stage **C** _____

_____

_____

Stage **D** _____

_____

_____

4.3.1.1 Communicable (infectious) diseases

Question 02 · continued

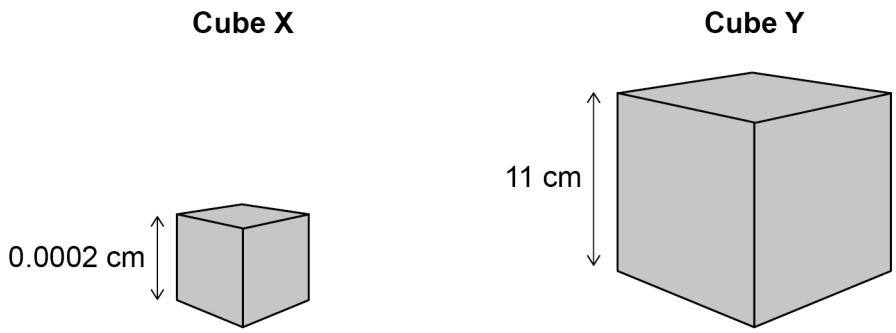


**0 4 . 6** **Figure 7** shows two cubes.

Cube **X** represents a bacterial cell.

Cube **Y** represents a small multicellular organism.

**Figure 7**




A bacterial cell can absorb all the nutrients it needs by diffusion through its outer surface.

Explain why a multicellular organism **cannot** absorb all the nutrients it needs by diffusion through its outer surface.

You **must** include calculations in your answer.

Use **Figure 7**.

**[5 marks]**

17

### 4.3.1.1 Communicable (infectious) diseases

**Question 03**

November 2020 | 8464/B/2H | Original Q3

**0 3** There is a need to grow enough food for all the people in the world.

Growing enough food affects habitats and biodiversity.

**0 3 . 1** What is meant by the term biodiversity?

**[1 mark]**

Peat bogs are being destroyed because peat is used by humans.

Destroying peat bogs also reduces biodiversity.

**0 3 . 2** Give **one** use of peat taken from peat bogs.

**[1 mark]**

**0 3 . 3** Explain why the use of peat is harmful to the environment.

Do **not** refer to biodiversity in your answer.

**[2 marks]**

4.3.1.1 Communicable (infectious) diseases

Question 03 · continued



**0 3 . 4** Intensive farming, where a single crop is grown on a large area of land year after year, is more cost effective for farmers.

It is efficient to use fertilisers and to burn the waste so the land is ready to use the next year.

Planting a single crop reduces biodiversity.

Suggest **two** ways that this type of farming can damage the environment.

Do **not** refer to biodiversity in your answer.

**[2 marks]**

1 _____

_____

2 _____

_____

**0 3 . 5** Most of the world's production of antibiotics is used in farming.

Antibiotics are given to animals to prevent the spread of disease.

Explain how the widespread use of antibiotics in farming is a threat to human life.

**[4 marks]**

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

10

### 4.3.1.1 Communicable (infectious) diseases

**Question 04**

November 2021 | 8464/B/1H | Original Q4

**0 4** Pathogens are microorganisms that cause diseases.

Gonorrhoea, malaria and measles are three diseases in humans.

**0 4 . 1** Draw **one** line from each disease to the pathogen that causes the disease.

**[3 marks]**

| Disease | Pathogen |
|---|---|
| | Bacterium |
| Gonorrhoea | |
| | Fungus |
| Malaria | |
| | Protist |
| Measles | |
| | Virus |

**Question 4 continues on the next page**

**0 4 . 2** Malaria is transmitted by mosquitos.

Male mosquitos can be sterilised so they are infertile.

The spread of malaria is reduced by releasing sterile mosquitos into the environment.

Explain how releasing sterile mosquitos reduces the spread of malaria.

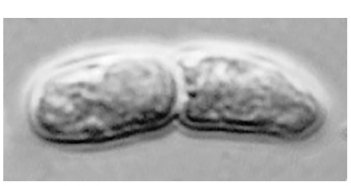
**[2 marks]**

Pathogens also cause diseases in plants.

**Figure 4** shows a rose black spot fungal spore and a tobacco mosaic virus.

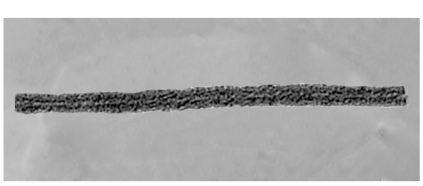
**Figure 4**

**Rose black spot fungal spore**



16 µm

**Tobacco mosaic virus**



$2.5 \times 10^{-7}$ m

Images are **not** to the same scale

**0 4 . 3** Name the piece of equipment used to view the virus.

**[1 mark]**

4.3.1.1 Communicable (infectious) diseases

Question 04 · continued



**0 4 . 4** How many times longer is the fungal spore than the virus?

Use **Figure 4**.

**[3 marks]**

Number of times longer = _____

**0 4 . 5** Explain why plants infected with tobacco mosaic virus grow slowly.

**[3 marks]**

12

### 4.3.1.1 Communicable (infectious) diseases

**Question 05**

June 2022 | 8464/B/1H | Original Q1

**0 1** Bacteria can cause a variety of diseases in humans.

**0 1 . 1** What are **two** similarities between a bacterial cell and an animal cell?

**[2 marks]**

Tick (✓) **two** boxes.

- Both have a cell membrane. ☐
- Both have a cell wall. ☐
- Both have a nucleus. ☐
- Both have cytoplasm. ☐
- Both have plasmids. ☐

**0 1 . 2** Salmonella food poisoning is caused by bacteria in food.

Give **one** symptom of salmonella food poisoning.

Do **not** refer to vomiting or diarrhoea in your answer.

**[1 mark]**

_____

_____

**Question 1 continues on the next page**

4.3.1.1 Communicable (infectious) diseases

Question 05 · continued



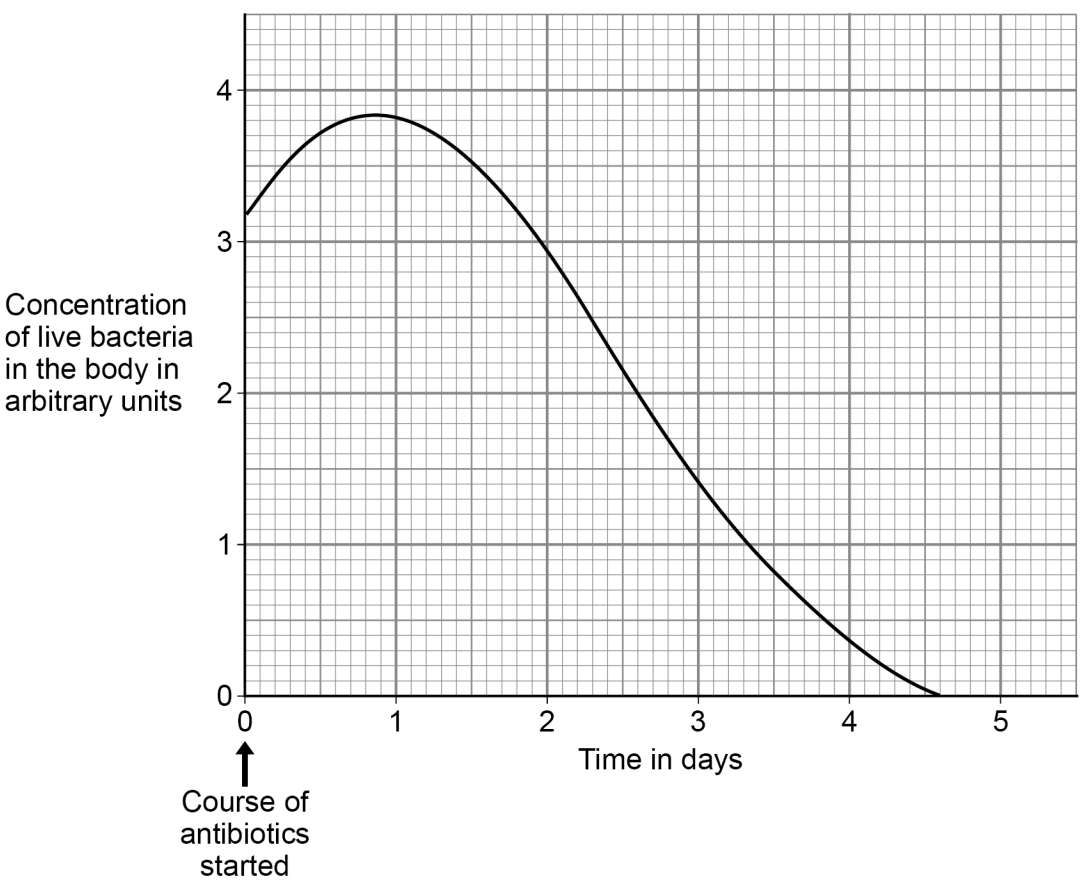
**0 1 . 3** What is the name of the first antibiotic developed?

**[1 mark]**

A child with a severe bacterial infection was given a course of antibiotics.

**Figure 1** shows how the concentration of live bacteria in the child's body changed when taking the course of antibiotics.

**Figure 1**



4.3.1.1 Communicable (infectious) diseases

Question 05 · continued



**0 1 . 4** The concentration of live bacteria in the body continued to increase after starting the course of antibiotics.

Suggest **one** reason why.

**[1 mark]**

**0 1 . 5** After 3 days of taking the antibiotic:

- the child felt better
- there were still bacteria in the child's body.

Why did the child feel better?

**[1 mark]**

Tick (✓) **one** box.

Bacteria had become immune to the antibiotic. ☐

The child had become resistant to the bacteria. ☐

There were fewer toxins in the body than at day 0 ☐

**0 1 . 6** Suggest why doctors do **not** give antibiotics to patients with minor infections.

**[1 mark]**

**Question 1 continues on the next page**

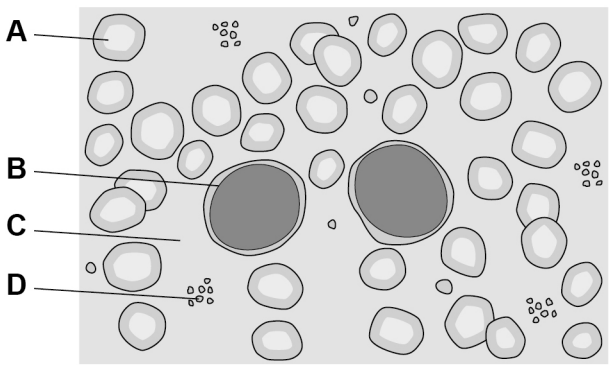
4.3.1.1 Communicable (infectious) diseases

Question 05 · continued



**Figure 2** shows blood viewed using a microscope.

**Figure 2**




**0 1 . 7** A vaccine will stimulate the production of antibodies.

Which part of the blood in **Figure 2** produces antibodies?

**[1 mark]**

Tick (✓) **one** box.

**A** ☐ **B** ☐ **C** ☐ **D** ☐

**0 1 . 8** Which part of the blood in **Figure 2** starts the clotting process?

**[1 mark]**

Tick (✓) **one** box.

**A** ☐ **B** ☐ **C** ☐ **D** ☐

9

### 4.3.1.1 Communicable (infectious) diseases

**Question 06**

June 2023 | 8464/B/1H | Original Q1

**0 1** Communicable and non-communicable diseases are major causes of ill health.

**0 1 . 1** Which disease is a **non-communicable** disease?

**[1 mark]**

Tick (✓) **one** box.

- AIDS ☐
- Cancer ☐
- Gonorrhoea ☐
- Malaria ☐

Obesity is a risk factor for many non-communicable diseases.

**0 1 . 2** Give **one** non-communicable disease that obesity is a risk factor for.

Do **not** refer to the diseases given in Question **01.1** in your answer.

**[1 mark]**

**0 1 . 3** National policies are used to help people who are obese to lose weight.

One national policy is to reduce the amount of sugar added to food and drinks.

Suggest **one other** national policy that could help people to lose weight.

**[1 mark]**

4.3.1.1 Communicable (infectious) diseases

Question 06 · continued



**0 1 . 4** Body mass index (BMI) is one measure of obesity.

BMI is calculated using the equation:

$$\text{BMI} = \frac{\text{body mass in kg}}{(\text{height in m})^2}$$

**Table 1** shows how BMI is used to describe an adult's BMI category.

**Table 1**

| BMI | BMI category |
|---|---|
| <18.5 | Underweight |
| 18.5 to 24.9 | Healthy weight |
| 25.0 to 29.9 | Overweight |
| >29.9 | Obese |

A person is 1.64 m tall and has a mass of 69 kg.

Determine the **BMI category** for this person.

Use the BMI equation and **Table 1**.

**[3 marks]**

The person's BMI category is _____

**Question 1 continues on the next page**

4.3.1.1 Communicable (infectious) diseases

Question 06 · continued



Scientists investigated the effect of smoking and of BMI on the birth mass of babies.

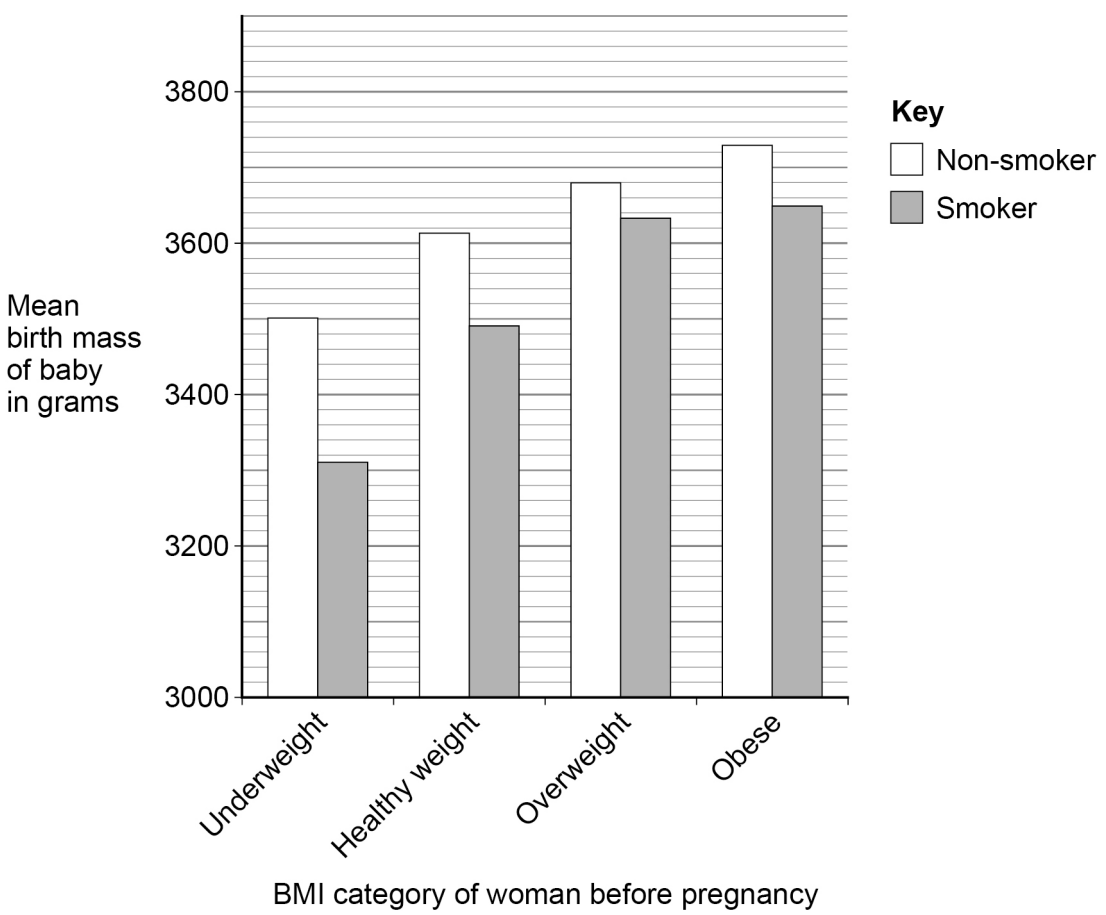
Women's BMI categories were determined before the women became pregnant.

**0 1 . 5** Suggest why BMI categories were determined **before** the women became pregnant.

**[1 mark]**

**Figure 1** shows the results.

**Figure 1**



4.3.1.1 Communicable (infectious) diseases

Question 06 · continued



**0 1 . 6** Give **two** conclusions that can be made from **Figure 1**.

**[2 marks]**

1 _____

_____

2 _____

_____

**0 1 . 7** Measles is a communicable disease.

A virus causes measles.

Describe how the measles virus is transferred from person to person.

**[2 marks]**

_____

_____

_____

_____

**Question 1 continues on the next page**

4.3.1.1 Communicable (infectious) diseases

Question 06 · continued



Athlete's foot is a communicable disease.

A fungus causes athlete's foot.

The athlete's foot fungus infects the skin on feet.

**0 1 . 8** Scientists estimate that 17% of the UK population have athlete's foot.

The estimated UK population is 67 961 900

Calculate how many people are estimated to have athlete's foot.

**[2 marks]**

Estimated number of people with athlete's foot = _____

**0 1 . 9** Athlete's foot fungus grows in moist conditions.

Suggest **one** way a person could reduce their chance of catching athlete's foot.

**[1 mark]**

**14**

### 4.3.1.1 Communicable (infectious) diseases

**Question 07**

June 2024 | 8464/B/1H | Original Q3

**0 3** This question is about communicable diseases.

Measles is a communicable disease caused by a pathogen.

**0 3 . 1** What type of microorganism causes measles?

**[1 mark]**

Vaccinations help reduce the spread of measles.

**0 3 . 2** Suggest **two** ways the spread of measles can be reduced.

Do **not** refer to vaccination in your answer.

**[2 marks]**

1

2

**0 3 . 3** Describe how the measles vaccine helps a person to become immune to the measles pathogen.

**[4 marks]**

4.3.1.1 Communicable (infectious) diseases

Question 07 · continued



Norovirus is a type of virus.

**0 3 . 4** Explain how viruses cause illness.

**[2 marks]**

**0 3 . 5** Drugs can help to reduce the symptoms of the norovirus infection.

New drugs must go through clinical trials before being licensed for use.

Give **three** reasons why clinical trials are needed.

**[3 marks]**

1

2

3

**12**

### 4.3.1.1 Communicable (infectious) diseases

**Question 08**

June 2025 | 8464/B/1H | Original Q2

**0 2** Chickenpox is an infectious disease that affects young children.

**0 2 . 1** One symptom of chickenpox is small blisters on the skin.

Suggest **one** way chickenpox spreads from an infected person to other people.

**[1 mark]**

**0 2 . 2** Chickenpox is caused by a type of pathogen that **cannot** be treated with antibiotics.

Give the reason why chickenpox **cannot** be treated with antibiotics.

**[1 mark]**

A vaccine that could be used to protect against chickenpox has been produced.

**0 2 . 3** What does a vaccine contain that causes a person to become immune to a disease?

**[1 mark]**

**0 2 . 4** Give **three** reasons why a new vaccine must be tested.

**[3 marks]**

1

2

3

4.3.1.1 Communicable (infectious) diseases

Question 08 · continued



**0 2 . 5** Explain how a vaccine for chickenpox gives immunity against the disease.

You should refer to how the body responds to:

- the vaccine
- chickenpox pathogens that enter the body after vaccination.

**[6 marks]**

Extra Space

12