

Communicable Diseases

Question Paper 1

Level	GCSE (9-1)
Subject	Combined Science: Trilogy - Biology
Exam Board	AQA
Topic	4.3 Infection and Response
Sub-Topic	Communicable Diseases
Difficulty Level	Bronze Level
Booklet	Question Paper 1

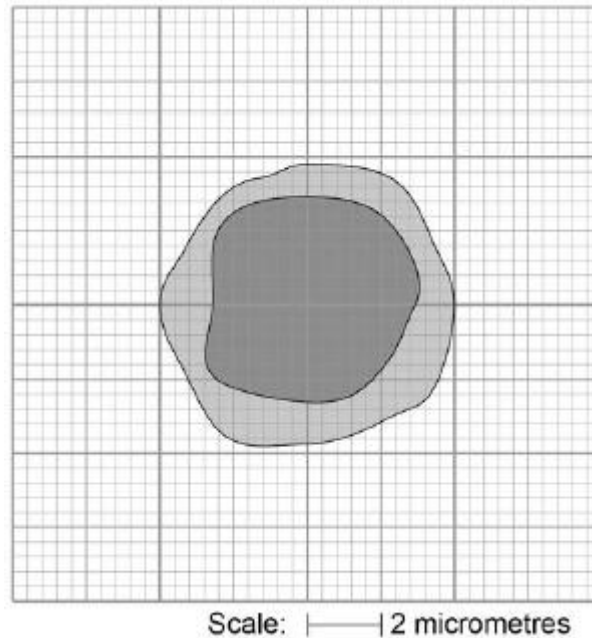
Time Allowed: 56 minutes

Score: /53

Percentage: /100

Grade Boundaries:

Q1. The figure below shows a scale drawing of one type of cell in blood.



- (a) Use the scale to determine the width of the cell.

Give your answer to the nearest micrometre.

.....

Width of cell = micrometres

(1)

- (b) Complete the table below.

Part of the blood	Function
	Carries oxygen around the body
	Protects the body against infection
Plasma	

(3)

- (c) Platelets are fragments of cells.

Platelets help the blood to clot.

Suggest what might happen if the blood did **not** clot.

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(1)
(Total 5 marks)

Q2. Pathogens cause infectious diseases in animals and plants.

- (a) Draw **one** line from each disease to the type of pathogen that causes the disease.

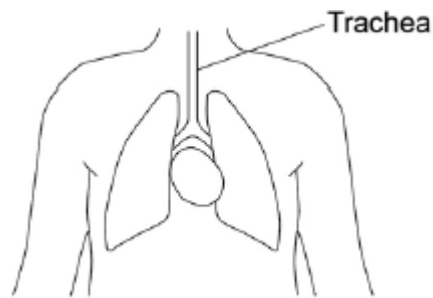
Disease	Type of pathogen
<div>Gonorrhoea</div>	<div>Bacterium</div>
<div>Malaria</div>	<div>Fungus</div>
<div>Measles</div>	<div>Protist</div>
	<div>Virus</div>

(3)

- (b) Some parts of the human body have adaptations to reduce the entry of live pathogens.

Look at **Figure 1**.

Figure 1



Explain how the trachea is adapted to reduce the entry of live pathogens.

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(4)

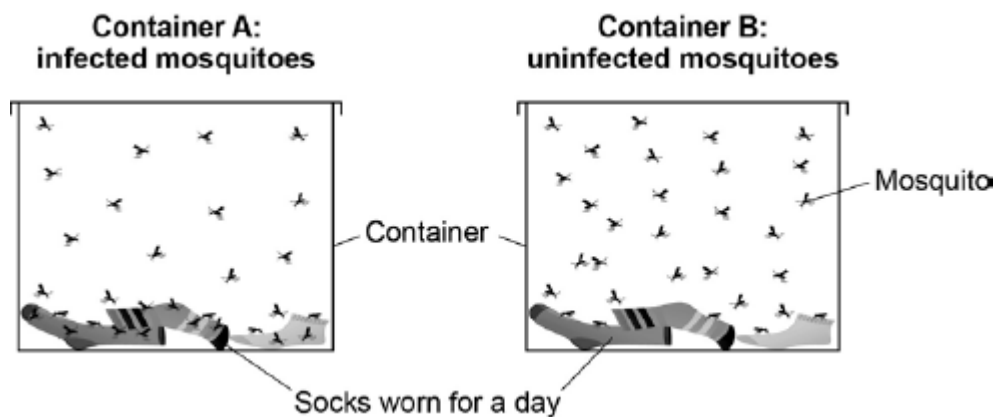
- (c) Malaria is a serious disease that can be fatal.

Malaria is spread to humans by infected mosquitoes.

Scientists investigated the behaviour of mosquitoes to understand how the spread of malaria could be controlled.

Figure 2 shows the equipment the scientists used.

Figure 2



This is the method used.

1. 30 mosquitoes **infected with malaria** were placed in Container **A**.
2. 30 **uninfected** mosquitoes were placed in Container **B**.
3. The total number of times the mosquitoes landed on the socks was recorded.

Name the dependent variable and suggest **one** control variable in this investigation.

Dependent variable

.....

Control variable

.....

(2)

- (d) Infected mosquitoes landed on the socks three times more often than uninfected mosquitoes.

Explain how this information can be used to reduce the spread of malaria.

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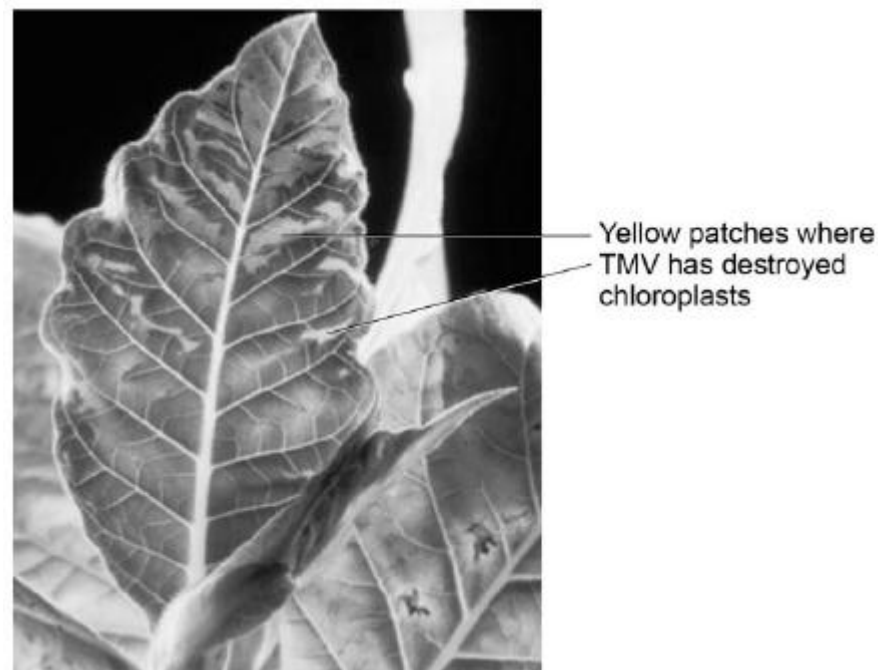
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(2)

- (e) Tobacco mosaic virus (TMV) affects many species of plant.

Figure 3 shows a leaf infected with TMV.

Figure 3



© Nigel Cattlin/Getty Images

TMV destroys chloroplasts in the leaf.

Explain how this could affect the growth of the plant.

.....

.....

.....

.....

.....

.....

(3)
(Total 14 marks)

Q3. Pathogens are microorganisms that cause infectious disease.

(a) Draw **one** line from each disease to the way the disease is spread.

Disease

**Way the disease is
spread**

	Animals that draw blood
Cholera	Drinking contaminated water
Cold	Droplets in the air when people cough or sneeze
Malaria	Eating food that is contaminated
	Breathing air polluted with carbon dioxide

(3)

- (b) One way the human body protects itself against the entry of pathogens is by producing antimicrobial chemicals.

Antimicrobial chemicals kill pathogens.

Give **two** other ways the human body protects itself against the **entry** of pathogens.

1

.....

2

.....

(2)

- (c) Measles is a childhood disease caused by a microorganism.

Measles is **not** treated by antibiotics.

Give the reason why.

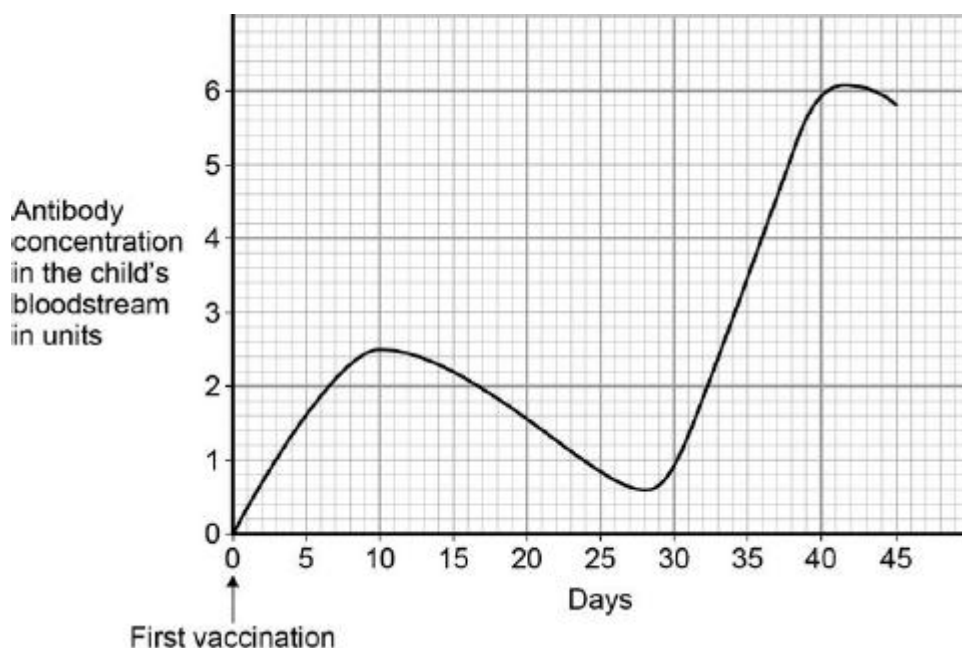
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(1)

- (d) Vaccinations help people become immune to infections.

In 2013, 92% of children in the UK had two vaccination injections against measles.

The figure below shows how the concentration of antibodies in the blood changes after each measles vaccination.



Suggest what day the second vaccination was given.

.....

(1)

- (e) What is the highest concentration of antibodies produced by the first vaccination?

.....

(1)

- (f) How will the number of children getting measles change as more children are vaccinated against measles?

Give a reason for your answer.

Change

Reason

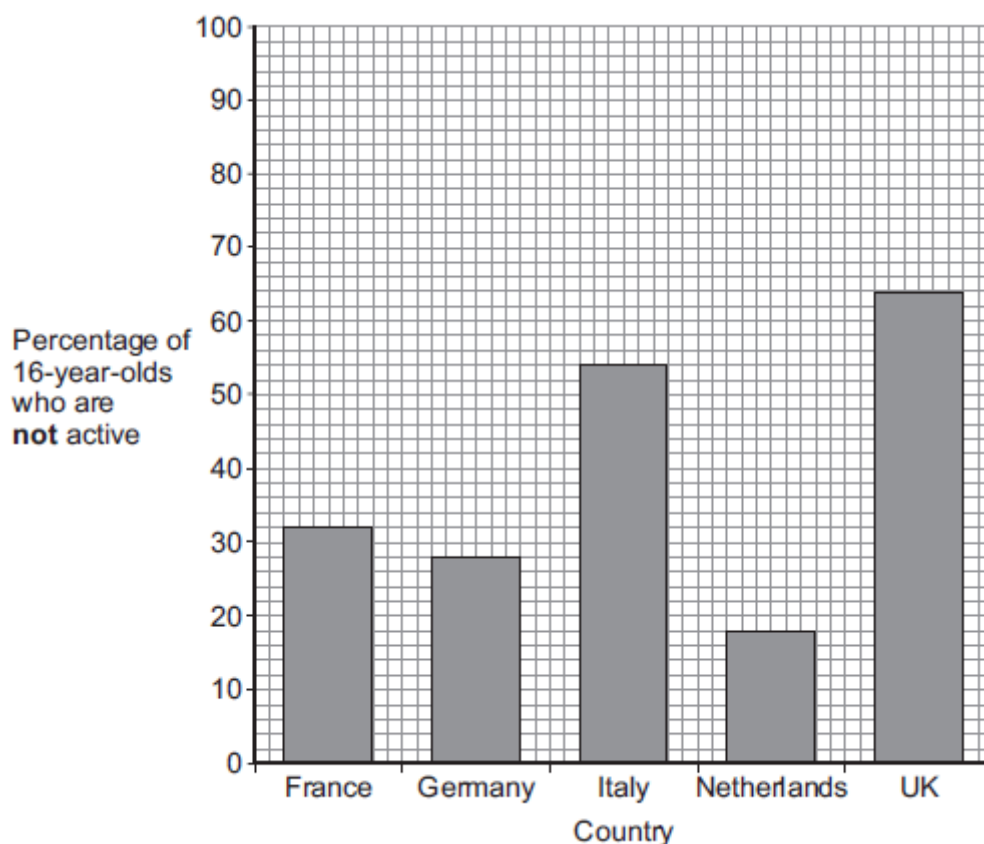
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(2)
(Total 10 marks)

Q4. Scientists investigated the effect of different factors on health.

- (a) People who are **not** active may have health problems.

The graph shows the percentage of 16-year-olds in some countries who are **not** active.



- (i) What percentage of 16-year-olds in the UK are **not** active?

..... %

(1)

- (ii) What percentage of 16-year-olds in the UK are **active**?

..... %

(1)

- (iii) A newspaper headline states:

People in the UK are the laziest in the world.

Information in **Figure 1** does **not** support the newspaper headline.

Suggest **one** reason why the newspaper headline may be wrong.

.....
.....

(1)

- (b) Doctors gave a percentage rating to the health of 16-year-olds.
100% is perfect health.

The table shows the amount of exercise 16-year-olds do and their health rating.

Amount of exercise done in minutes every week	Health rating as %
Less than 30	72
90	76
180	82
300	92

What conclusion can be made about the effect of exercise on health?

Use information from the table.

.....
.....

(1)

- (c) Inherited factors can also affect health.

Give **one** health problem that may be affected by the genes someone inherits.

Draw a ring around the correct answer.

being
malnourished

having a high
cholesterol level

having a
deficiency disease

(1)

- (d) White blood cells are part of the immune system.

Use the correct answer from the box to complete each sentence.

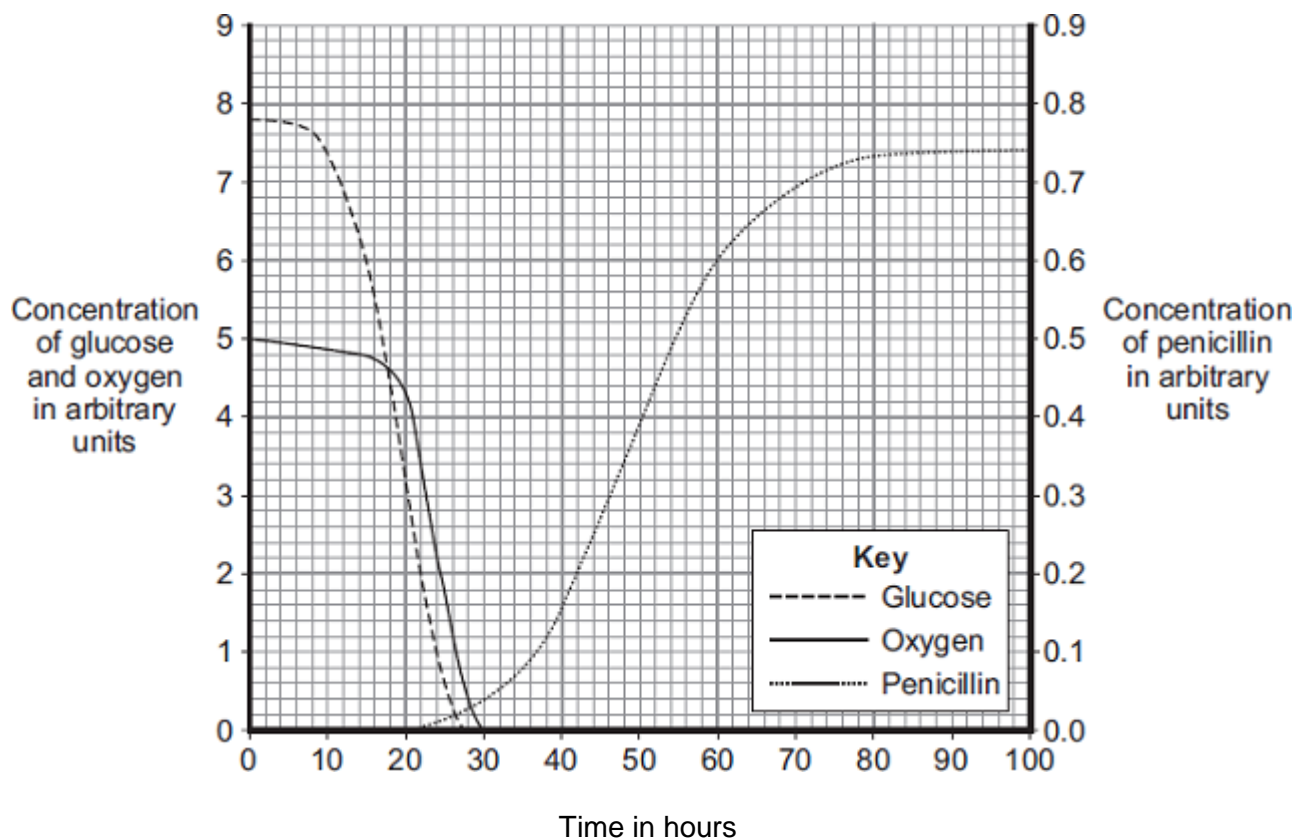
antibiotics	antibodies	pathogens	vaccines
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- (i) When we are ill, white blood cells produce to kill microorganisms. (1)

- (ii) Many strains of bacteria, including MRSA, have developed resistance to drugs called (1)
- (Total 7 marks)

Q5.The mould *Penicillium* can be grown in a fermenter. *Penicillium* produces the antibiotic penicillin.

The graph shows changes that occurred in a fermenter during the production of penicillin.



- (a) During which time period was penicillin produced most quickly?

Draw a ring around **one** answer.

0 – 20 hours

40 – 60 hours

80 – 100 hours

(1)

- (b) (i) Describe how the concentration of glucose in the fermenter changes between 0 and 30 hours.

.....

.....

.....

.....

(2)

- (ii) How does the change in the concentration of oxygen in the fermenter compare with the change in concentration of glucose between 0 and 30 hours?

Tick (✓) **two** boxes.

The oxygen concentration changes after the glucose concentration.

☐

The oxygen concentration changes before the glucose concentration.

☐

The oxygen concentration changes less than the glucose concentration.

☐

The oxygen concentration changes more than the glucose concentration.

☐

(2)

(iii) What is the name of the process that uses glucose?

Draw a ring around **one** answer.

distillation

filtration

respiration

(1)

(Total 6 marks)

Q6. Obesity is linked to several diseases.

(a) Name **two** diseases linked to obesity.

1

2

(2)

(b) Scientists trialled a new slimming drug.

The table shows their results after one year.

Percentage change in mass of each volunteer	Number of volunteers	gained mass or lost 0 to 3.9 %	1900
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lost 4.0 to 4.9 %	1100
lost 5.0 to 9.9 %	1500
lost 10 % or more	1500

- (i) Calculate the proportion of the volunteers who lost 10 % or more of their mass.

You should first calculate the total number of volunteers, then work out the proportion.

.....

Proportion of volunteers =

(2)

- (ii) The National Health Service (NHS) gave permission for the drug to be used.

Use information from the table to suggest a reason why the NHS gave permission for the drug to be used.

.....

(1)

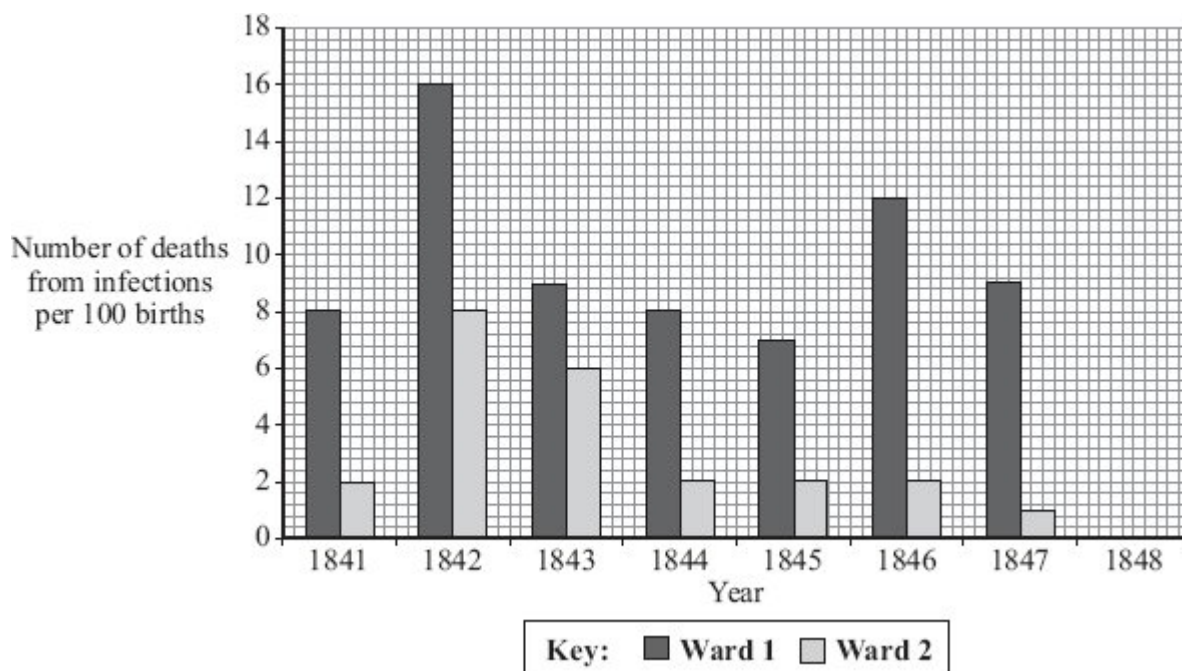
(Total 5 marks)

Q7. In the 19th century, Dr Semmelweiss investigated infection in a hospital.

He compared the number of deaths of mothers on two maternity wards.

- On **Ward 1**, babies were delivered mainly by doctors. These doctors worked on many different wards in the hospital.
- On **Ward 2**, babies were delivered by midwives. The midwives did **not** work on other wards.

The bar chart shows the results of his investigations.



- (a) (i) 600 mothers gave birth on **Ward 2** in 1845.

How many mothers died from infections on **Ward 2** in 1845?

Show clearly how you work out your answer.

.....

.....

Number of mothers who died

(2)

- (ii) Which was the safer ward on which to have a baby?

Draw a ring around your answer. **Ward 1 / Ward 2.**

Using data from the bar chart, give a reason for your answer.

.....

.....

(1)

- (b) In January 1848, Dr Semmelweiss asked all doctors to wash their hands before delivering babies.

The table shows the number of deaths on the two wards in 1848.

Ward	Number of deaths from infections per 100 births
Ward 1	3
Ward 2	1

- (i) Plot this data on the bar chart above.

(1)

- (ii) What was the effect on the death rate on **Ward 1** of doctors washing their hands before delivering babies?

.....
.....

(1)

- (iii) Suggest an explanation for this effect.

.....
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(1)

(Total 6 marks)