CAMBRIDGE IGCSE BIOLOGY · 0610

BIOLOGY



EXAM QUESTION PACK

TOPIC 10: DISEASES AND IMMUNITY

SCORE	PERCENTAGE
/	%

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Diseases and immunity – 2023 November IGCSE 0610

1. Nov/2023 /Paper_ 0610/11/No.19

Which type of cells produce antibodies?

A ciliated cells

B platelets

C red blood cells

D white blood cells

2. Nov/2023 /Paper_ 0610/11/No.20

What is an example of a transmissible disease?

A coronary heart disease caused by eating a high fat diet

B AIDS

C liver disease caused by excessive alcohol consumption

D scurvy

3. Nov/2023 /Paper_ 0610/11/No.29

Which diseases can be successfully treated with antibiotics?

	diseases caused by bacteria	rickets	diseases caused by viruses
A	✓	✓	✓
B	✓	✗	✗
C	✗	✓	✗
D	✗	✗	✓

key

✓ = can be treated

✗ = cannot be treated

4. Nov/2023 /Paper_ 0610/11/No.32

What can be used to reduce the transmission of HIV?

	face masks	screening blood donors	sterile needles for drug users	washing hands
A	✓	✗	✗	✗
B	✗	✓	✓	✗
C	✗	✗	✓	✓
D	✓	✓	✗	✗

key

✓ = can be used to reduce transmission

✗ = cannot be used to reduce transmission

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5. Nov/2023 /Paper_ 0610/13/No.20

What are disease-causing organisms?

A antibodies

B pathogens

C phagocytes

D vaccines

6. Nov/2023 /Paper_ 0610/21/No.20

A patient was injected with antibodies after being bitten by a poisonous snake. The patient recovered and survived.

What describes the effect of the injection in the patient's body?

	active immunity	passive immunity	memory cells produced
A	✓	✗	✓
B	✓	✗	✗
C	✗	✓	✓
D	✗	✓	✗

key

✓ = yes

✗ = no

7. Nov/2023 /Paper_ 0610/21/No.19

What is the role of lymphocytes in the blood?

A antibody production

B blood clotting

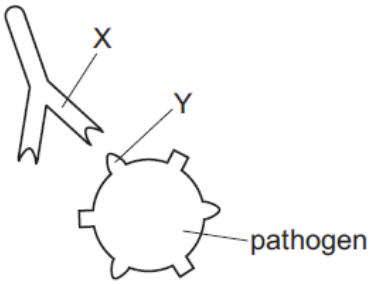
C phagocytosis

D oxygen transport

8. Nov/2023 /Paper_ 0610/22/No.20

When a pathogen enters the blood, the immune system uses different mechanisms to destroy the pathogen.

The diagram shows one of these mechanisms.



Which row describes the structures involved?

	structure X	X is made by	structure Y
A	antigen	lymphocytes	antibody
B	antigen	phagocytes	antibody
C	antibody	lymphocytes	antigen
D	antibody	phagocytes	antigen

9. Nov/2023 /Paper_ 0610/23/No.20

Cholera infection can cause the following events.

1 Cells lining the small intestine secrete chloride ions.

2 Cholera bacteria produce a toxin.

3 Chloride ions move into the small intestine.

4 Water from the blood moves into the small intestine by osmosis.

5 Water potential of fluid in the small intestine becomes lower.

Which sequence of events will cause diarrhoea?

A 1 → 3 → 2 → 4 → 5

B 2 → 1 → 3 → 5 → 4

C 3 → 1 → 4 → 5 → 2

D 2 → 3 → 1 → 4 → 5

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10. Nov/2023 /Paper_ 0610/23/No.21

Which row shows the composition of expired air from a healthy person?

	carbon dioxide %	oxygen %	water vapour
A	0.04	21	saturated
B	0.04	16	variable
C	4	21	variable
D	4	16	saturated

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11. Nov/2023 /Paper_ 0610/31/No.7

(a) HIV infection can lead to AIDS.

(i) State the words that the letters HIV represent.

..... [1]

(ii) Describe ways of reducing the risk of a person becoming infected with HIV.

.....

.....

.....

.....

.....

.....

..... [3]

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(b) Chlamydia, gonorrhoea and syphilis are sexually transmitted infections (STIs).

Table 7.1 shows the numbers of people infected with these STIs in one country from 2014 to 2018.

Table 7.1

year	number of people infected		
	chlamydia	gonorrhoea	syphilis
2014	1400000	350000	19000
2016	1600000	468000	27000
2018	1800000	583000	35000

(i) The list shows some conclusions.

Place ticks (✓) in the boxes to identify **two** correct conclusions for the data shown in Table 7.1.

In 2014, there were 1050000 more people infected with chlamydia than were infected with gonorrhoea in 2014.	
In 2016, the number of people infected with chlamydia was three times greater than the number of people infected with gonorrhoea.	
In 2018, more people were infected with syphilis than with gonorrhoea.	
The number of people with STIs has increased each year.	
Between 2016 and 2018, the number of people infected with syphilis increased by 16000.	

[2]

(ii) Syphilis can be treated with antibiotics.

Suggest the type of organism that causes syphilis.

..... [1]

[Total: 7]

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Diseases and immunity – 2023 June IGCSE Biology 0610

1. June/2023/Paper_0610/11/No.21

What is an example of good personal hygiene in the kitchen?

A cooking food at a high temperature

B disposing of waste food in sealed containers

C storing uncooked meat in a fridge

D washing hands before eating food

2. June/2023/Paper_0610/11/No.30

Which statements about antibiotics are correct?

1 Antibiotics can be used to treat bacterial infections.

2 Antibiotics can be used to treat viral infections.

3 Antibiotics are **not** effective against resistant bacteria.

A 1, 2 and 3 **B** 1 and 2 only **C** 1 and 3 only **D** 2 and 3 only

3. June/2023/Paper_0610/12/No.29

The table shows which antibiotics are effective against different types of bacteria.

The shaded areas show the antibiotic is effective against that type of bacteria.

	type of bacteria			
antibiotic	MRSA	*Streptococcus*	*Pseudomonas*	*Anaerobes*
1				
2				
3				
4				
5				
6				

A person has a disease caused by a type of *Streptococcus* bacteria and a second infection caused by a type of *Pseudomonas* bacteria.

Which antibiotic should be taken?

A 1 or 6 **B** 2 or 4 **C** 3 or 4 **D** 5 or 6

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4. June/2023/Paper_0610/13/No.30

Which type of organism causes AIDS?

A bacterium

B fungus

C myriapod

D virus

5. June/2023/Paper_0610/21/No.19

The cholera bacterium toxin causes dehydration and loss of salts from the blood in humans.

Which statement explains the reason for this?

A Chloride ions are secreted into the small intestine where they increase the water potential.

B Chloride ions are secreted into the small intestine which causes water to move into the intestine by osmosis.

C Chloride ions are secreted into the small intestine which causes water to move out of the intestine by osmosis.

D Chloride ions are secreted into the small intestine which causes the water potential of the blood to decrease.

6. June/2023/Paper_0610/21/No.27

What is a correct statement about antibiotics?

A Bacteria may become resistant to antibiotics as a result of artificial selection.

B Bacteria may become resistant to antibiotics as a result of natural selection.

C Viruses may become resistant to antibiotics as a result of artificial selection.

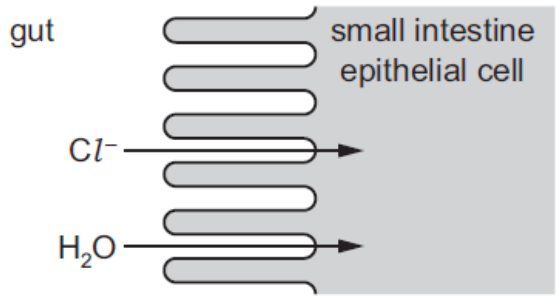
D Viruses may become resistant to antibiotics as a result of natural selection.

7. June/2023/Paper_0610/22/No.19

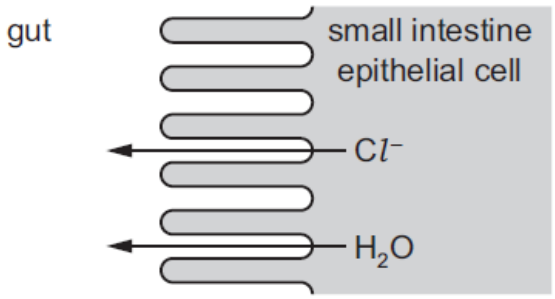
Cholera bacteria in the gut cause secretion of chloride ions which leads to diarrhoea.

Which diagram shows the correct movement of chloride ions (Cl^-) and water (H_2O)?

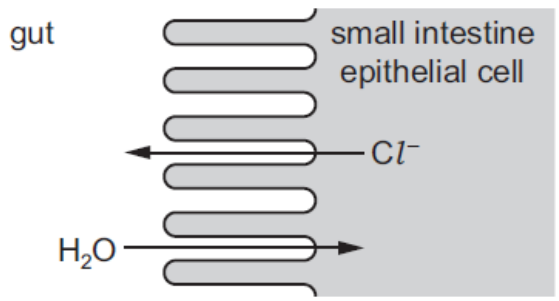
A



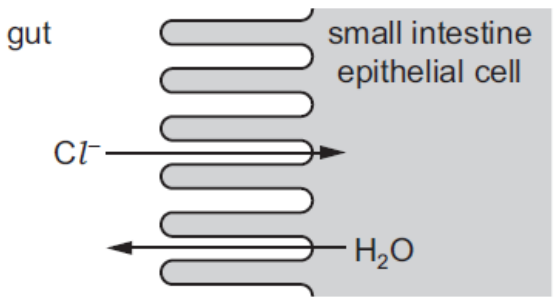
B



C



D



8. June/2023/Paper_0610/23/No.19

When a person is given a vaccine, a harmless pathogen is injected. The pathogen has .....1..... which cause lymphocytes to produce .....2..... . This is an example of .....3..... immunity.

Which words should be used to fill gaps 1, 2 and 3 to complete the sentences?

	1	2	3
A	antigens	antibodies	active
B	antigens	antibodies	passive
C	antibodies	antigens	active
D	antibodies	antigens	passive

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(a) Antibiotic resistance is an increasing problem worldwide.

Erythromycin is an antibiotic.

Fig. 3.1 shows the daily doses of erythromycin per 1000 people over a 13-year period.

The number of bacterial infections resistant to erythromycin per 1000 people is also shown.

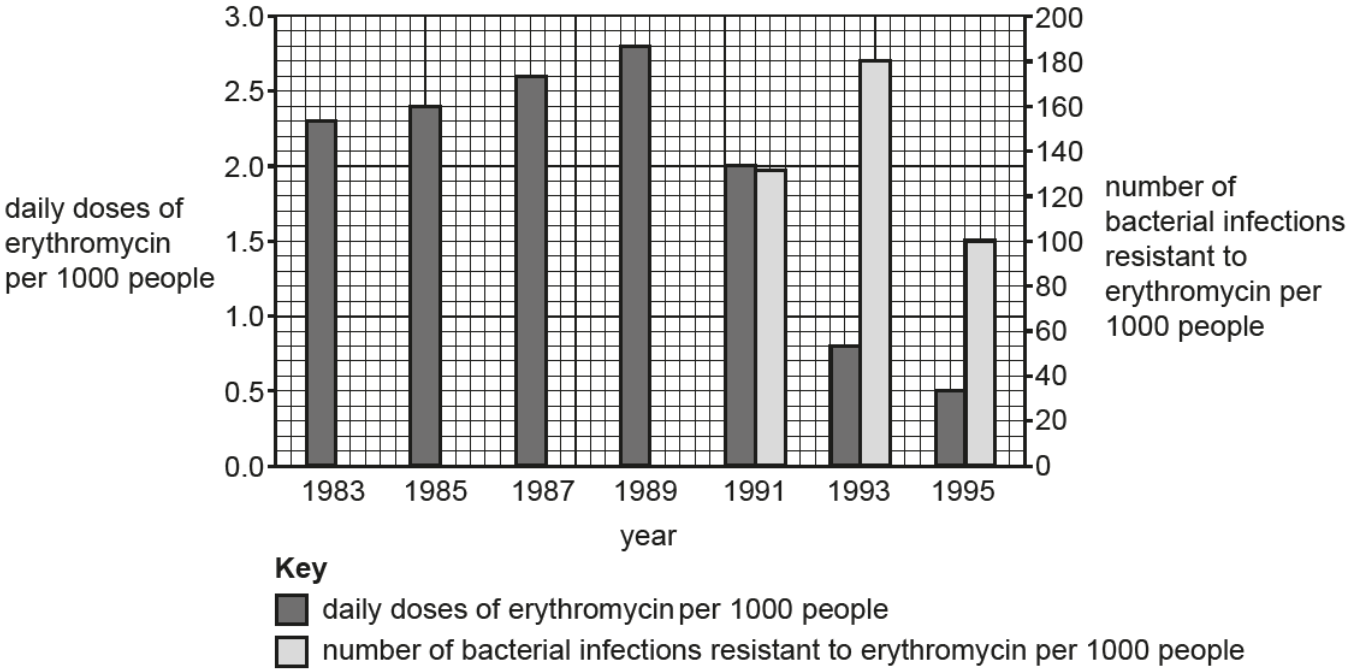


Fig. 3.1

(i) Calculate the percentage change in the number of bacterial infections resistant to erythromycin per 1000 people between 1993 and 1995.

Give your answer to **two** significant figures.

Space for working.

.....%
[3]

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(ii) Describe the data shown in Fig. 3.1.

.....

.....

.....

.....

.....

.....

..... [3]

(iii) Suggest reasons for the change in the number of bacterial infections resistant to erythromycin from 1993 to 1995 shown in Fig. 3.1.

.....

.....

.....

.....

..... [2]

(iv) Explain how bacteria become resistant to antibiotics.

.....

.....

.....

.....

.....

.....

.....

.....

.....

..... [5]

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10. March/2023/Paper_ 0610/12/No.21

What is defined as a disease-causing organism?

A bacterium

B pathogen

C phagocyte

D virus

11. March/2023/Paper_ 0610/12/No.29

Which row shows why only some infections can be successfully treated with antibiotics?

	antibiotics kill		
	bacteria	resistant bacteria	viruses
A	yes	yes	no
B	no	no	yes
C	yes	no	no
D	no	yes	yes

12. March/2023/Paper_ 0610/22/No.19

The sequence of amino acids in antibodies enables them to complete which function?

A bind to a specific antigen

B bind to all pathogens

C perform phagocytosis

D confer passive immunity for all diseases

13. March/2023/Paper_ 0610/22/No.27

Why is an MRSA infection difficult to treat?

A MRSA is a bacterium.

B MRSA is a virus.

C MRSA is resistant to some antibiotics.

D MRSA is resistant to some antibodies.

14. March/2023/Paper_ 0610/32/No.1

(a) The nutrient content of five different foods was analysed.

The mass of each nutrient per 100 g of food was estimated.

Table 1.1 shows the results.

Table 1.1

	mass of nutrient per 100 g of food / g			
food	carbohydrates	fats	protein	fibre
A	12	1	5	6
B	23	8	14	2
C	0	36	25	0
D	7	54	28	7
E	21	7	5	8

The recommended daily allowance for these nutrients for an adult is:

- fat – a maximum of 70 g per day
- protein – 50 g per day.

(i) Identify the food in Table 1.1 which contains the most carbohydrate per 100 g.

..... [1]

(ii) A person eats 200 g of each food.

Using the information in Table 1.1, identify the **two** foods that would provide **more** than the recommended daily allowance of fat.

..... and .....

[2]

(iii) Using the information in Table 1.1, calculate the number of grams of food **C** needed to provide the recommended daily allowance of protein.

..... g [1]

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(iv) State **two** groups of nutrients missing from Table 1.1 that are needed as part of a balanced diet.

1 .....

2 .....

[2]

(v) Explain why food **E** is recommended as part of a balanced diet.

.....

.....

.....

.....

.....

.....

..... [3]

(b) Most foods contain some carbohydrates.

State the names of the chemical elements contained in carbohydrates.

..... [1]

(c) Starch is a type of carbohydrate.

Circle the names of **two** other carbohydrates from the list.

amino acids	**amylase**	**cellulose**	**ethanol**
glycogen	**oil**	**protein**	**urea**

[2]

[Total: 12]

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Diseases and immunity – 2022 November IGCSE 0610 Biology

1. Nov/2022/Paper_11/No.21

Campylobacter is a bacterium that can cause food poisoning.

Which word describes *Campylobacter*?

A antibody

B disease

C pathogen

D symptom

2. Nov/2022/Paper_11/No.29

A disease cannot be treated with antibiotics.

What could be the reasons for this?

1 It is not a bacterial disease.

2 The pathogen is a virus.

3 The patient has become resistant to the antibiotic.

A 1 and 2 only **B** 1 and 3 only **C** 2 and 3 only **D** 1, 2 and 3

3. Nov/2022/Paper_12/No.21

Campylobacter is a bacterium that can cause food poisoning.

Which word describes *Campylobacter*?

A antibody

B disease

C pathogen

D symptom

4. Nov/2022/Paper_13/No.21

Campylobacter is a bacterium that can cause food poisoning.

Which word describes *Campylobacter*?

A antibody

B disease

C pathogen

D symptom

5. Nov/2022/Paper_21/No.13

The cholera bacterium produces toxins that cause chloride ions to be secreted into the small intestine.

What is the immediate effect of this on the water potential of blood in the intestinal capillaries, and on the water potential of the contents of the small intestine?

	water potential	
	blood in capillaries	contents of small intestine
A	lowered	lowered
B	lowered	raised
C	raised	lowered
D	raised	raised

6. Nov/2022/Paper_21/No.27

A disease cannot be treated with antibiotics.

What could be the reasons for this?

1 It is not a bacterial disease.

2 The pathogen is a virus.

3 The patient has become resistant to the antibiotic.

A 1 and 2 only **B** 1 and 3 only **C** 2 and 3 only **D** 1, 2 and 3

7. Nov/2022/Paper_22/No.19

Campylobacter is a bacterium that can cause food poisoning.

Which word describes *Campylobacter*?

A antibody

B disease

C pathogen

D symptom

8. Nov/2022/Paper_22/No.29

Which statement describes passive immunity?

A the process of antigen production in the body

B defence against pathogens by antibodies acquired from another individual

C the type of immunity that results from vaccination

D immunity that results in the production of memory cells

9. Nov/2022/Paper_23/No.19

Campylobacter is a bacterium that can cause food poisoning.

Which word describes *Campylobacter*?

A antibody

B disease

C pathogen

D symptom

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Diseases and immunity – 2022 June IGCSE 0610

1. June/2022/Paper_ 11/No.21

The body has several defence mechanisms to protect against disease.

Which defence mechanism is a chemical barrier?

A hairs in the nose

B mucus

C skin

D white blood cells

2. June/2022/Paper_ 12/No.21

Which disease is caused by a pathogen?

A cholera

B coronary heart disease

C lung cancer

D scurvy

3. June/2022/Paper_ 13/No.1

All living organisms release energy from nutrient molecules within their cells.

What is the name of this characteristic?

A growth

B nutrition

C respiration

D sensitivity

4. June/2022/Paper_ 13/No.2

The scientific names of some animals are listed.

1 *Arius felis*

2 *Felis concolor*

3 *Felis rufus*

4 *Macropus rufus*

Which animals are in the same genus?

A 1, 2 and 3 **B** 2, 3 and 4 **C** 2 and 3 only **D** 3 and 4 only

5. June/2022/Paper_ 13/No.21

The body has several methods of avoiding infection by pathogens, including specialised cells, mechanical barriers and chemical barriers.

Which row has a correct example for each method?

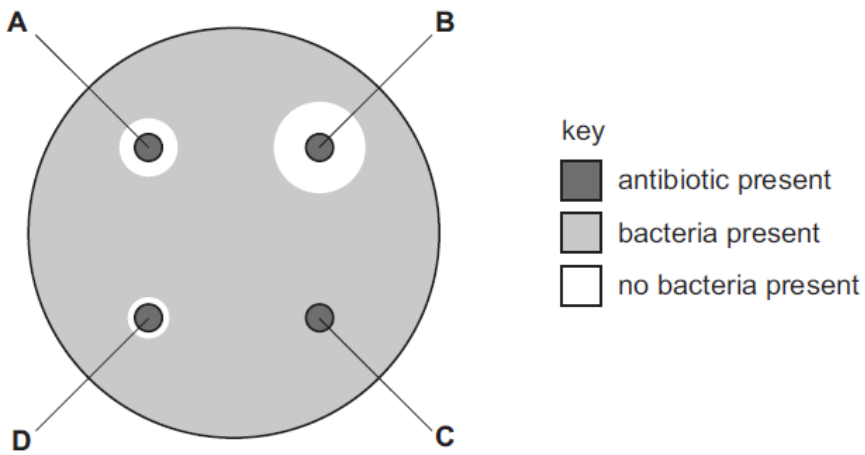
	specialised cells	mechanical barrier	chemical barrier
A	hairs in the nose	stomach acid	phagocytes
B	hairs in the nose	phagocytes	stomach acid
C	phagocytes	stomach acid	hairs in the nose
D	phagocytes	hairs in the nose	stomach acid

6. June/2022/Paper_ 13/No.30

The diagram shows the effect of four different antibiotics, **A**, **B**, **C** and **D**, on the growth of one type of bacteria. The bacteria were grown on agar jelly in a Petri dish. When bacteria covered the whole surface of the agar, paper discs soaked in each antibiotic were placed on top of the agar.

The diagram shows the appearance of the Petri dish 48 hours after the paper discs were added.

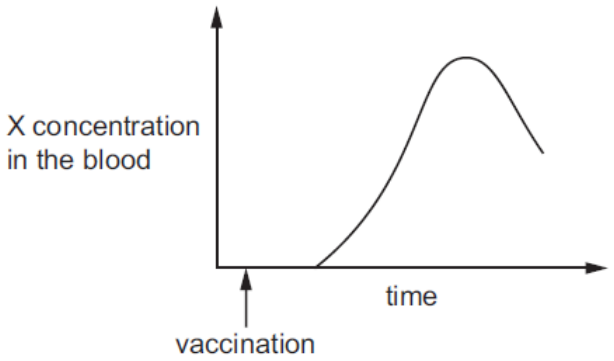
Which antibiotic is the **most** effective treatment for this type of bacteria?



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7. June/2022/Paper_ 21/No.19

The graph shows the response of the body to vaccination.



Which word should be used to replace the letter X, to complete the label on the *y*-axis?

A antibody

B antigen

C pathogen

D platelet

8. June/2022/Paper_ 21/No.20

Which cells produce mucus?

A ciliated cells

B goblet cells

C nerve cells

D white blood cells

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9. June/2022/Paper_ 32/No.6(a_ b)

Pathogens in food can cause diarrhoea.

(a) Describe diarrhoea and state how diarrhoea can be treated.

.....

.....

.....

.....

..... [2]

(b) Describe ways of preventing the spread of diseases that are caused by pathogens in food.

.....

.....

.....

.....

.....

.....

.....

.....

..... [4]

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10. June/2022/Paper_ 33/No.8(a_ b)

(a) Complete the description of the immune system, using the words from the list.

Each word may be used once, more than once or not at all.

antibodies	**antigens**	**biological**	**block**
chemical	**engulf**	**hairs**	**mechanical**
	nails	**vaccines**	

The body has defences to protect against infectious diseases.

Skin and ..... in the nose are ..... barriers.

Some types of blood cell are involved in defending the body against infectious diseases.

Some blood cells can produce ..... which can kill the pathogen.

Other cells can ..... the pathogen in a process called phagocytosis.

[4]

(b) Describe actions that can be taken by individuals in their homes to reduce the spread of disease.

.....

.....

.....

.....

.....

.....

..... [3]

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11. June/2022/Paper_ 42/No.4

Fig. 4.1 is a diagram of a virus.

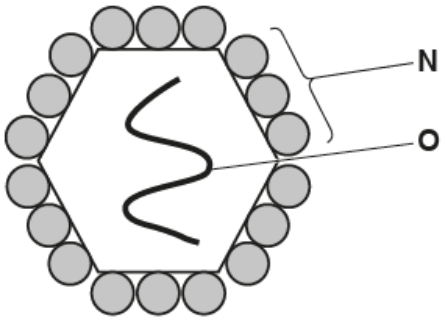


Fig. 4.1

(a) Identify the parts of the virus labelled **N** and **O**.

N .....

O .....

[2]

(b) The human immunodeficiency virus (HIV) infects and destroys lymphocytes.

The number of lymphocytes in the blood of a person infected with HIV was measured over a period of 84 months.

The results are shown in Fig. 4.2.

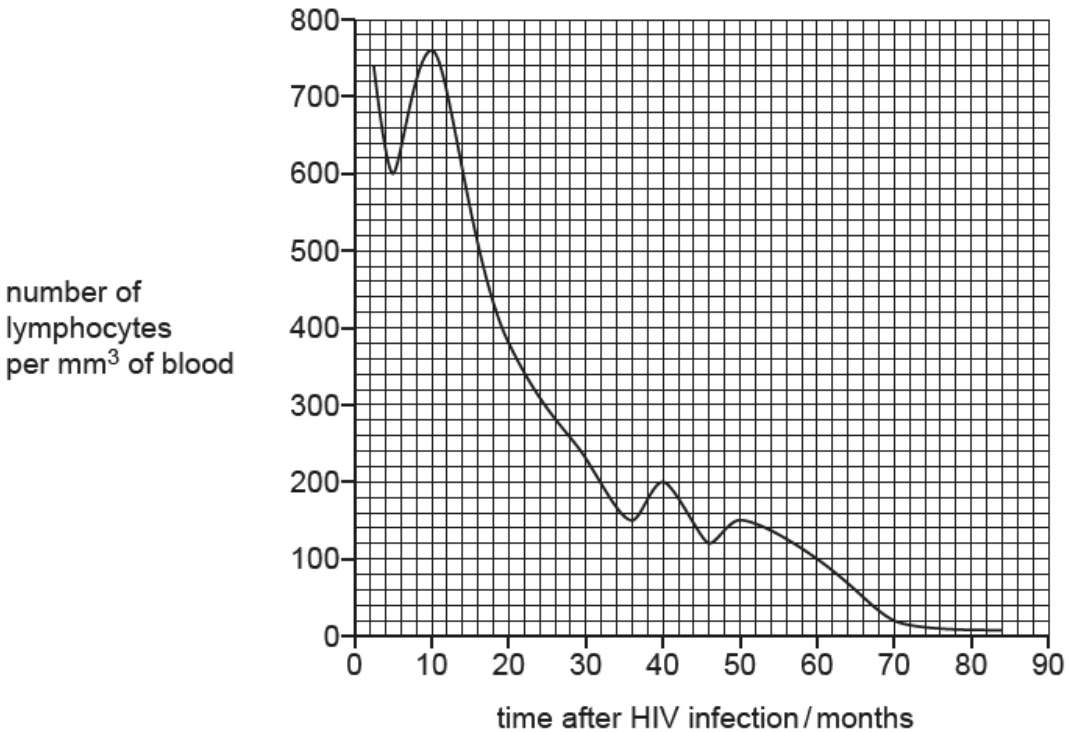


Fig. 4.2

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(i) Use the information shown in Fig. 4.2 to calculate the percentage change in the number of lymphocytes from month 10 to month 60.

Give your answer to **two** significant figures.

Space for working.

.....%
[3]

(ii) Describe the changes in the number of lymphocytes, over the 84 months following infection with HIV, shown in Fig. 4.2.

.....

.....

.....

.....

..... [2]

(iii) Outline the consequences of the changes in the number of lymphocytes for the health of the person infected with HIV.

.....

.....

.....

.....

.....

.....

.....

.....

..... [4]

/

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(iv) Explain why antibiotics are **not** used to treat viral infections.

.....

.....

.....

.....

..... [2]

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Diseases and immunity – 2021 IGCSE 0610

1. Nov/2021/Paper_11/No.21

Some features that help to defend the body against pathogens are listed.

1 mucus

2 skin

3 stomach acid

4 phagocytosis

Which features can prevent pathogens entering body tissues?

A 1, 2, 3 and 4

B 1, 2 and 3 only

C 2 and 3 only

D 4 only

2. Nov/2021/Paper_12/No.21

Some features that help to defend the body against pathogens are listed.

1 mucus

2 skin

3 stomach acid

4 phagocytosis

Which features can prevent pathogens entering body tissues?

A 1, 2, 3 and 4

B 1, 2 and 3 only

C 2 and 3 only

D 4 only

3. Nov/2021/Paper_12/No.29

Which substance can be used to treat a bacterial infection?

A adrenaline

B antibiotics

C antigens

D insulin

4. Nov/2021/Paper_12/No.32

HIV is a sexually transmitted infection (STI).

Which methods could be used to reduce the spread of HIV?

1 breast-feed babies

2 education about how HIV is spread

3 provide easy access to condoms

4 provide needle exchange schemes for drug users

A 1, 2 and 3 **B** 1, 2 and 4 **C** 1, 3 and 4 **D** 2, 3 and 4

5. Nov/2021/Paper_13/No.21

Some features that help to defend the body against pathogens are listed.

1 mucus

2 skin

3 stomach acid

4 phagocytosis

Which features can prevent pathogens entering body tissues?

A 1, 2, 3 and 4

B 1, 2 and 3 only

C 2 and 3 only

D 4 only

6. Nov/2021/Paper_22/No.21

Some features that help to defend the body against pathogens are listed.

1 mucus

2 skin

3 stomach acid

4 phagocytosis

Which features can prevent pathogens entering body tissues?

A 1, 2, 3 and 4

B 1, 2 and 3 only

C 2 and 3 only

D 4 only

7. Nov/2021/Paper_22/No.30

Which statement about the human immunodeficiency virus (HIV) is correct?

A Antibodies cannot be made.

B HIV infections can be treated with antibiotics.

C HIV destroys lymphocytes.

D HIV is spread by coughing and sneezing.

8. Nov/2021/Paper_23/No.21

Some features that help to defend the body against pathogens are listed.

1 mucus

2 skin

3 stomach acid

4 phagocytosis

Which features can prevent pathogens entering body tissues?

A 1, 2, 3 and 4

B 1, 2 and 3 only

C 2 and 3 only

D 4 only

9. Nov/2021/Paper_23/No.27

How can the development of antibiotic resistance in bacteria be reduced?

A treating every disease with antibiotics

B treating infections caused by a virus with antibiotics

C using antibiotics only when essential

D using antibiotics regularly to prevent disease

10. Nov/2021/Paper_23/No.30

What are likely consequences of HIV infection?

1 decreased lymphocyte numbers

2 reduced active immunity

3 reduced passive immunity

A 1, 2 and 3 **B** 1 and 2 only **C** 1 and 3 only **D** 2 and 3 only

11. Nov/2021/Paper_33/No.2

Transmissible diseases are caused by pathogens.

(a) Cholera is a transmissible disease that causes diarrhoea.

State the type of organism that causes cholera.

..... [1]

(b) One method of controlling the spread of disease is to treat raw sewage to make it safe.

(i) Describe how raw sewage is treated to make the water safe to drink and safe to release into the sea.

.....

.....

.....

.....

.....

.....

..... [3]

(ii) State **one** other method of controlling the spread of disease.

..... [1]

(c) The body has defences against diseases.

(i) The body has barriers that prevent pathogens from entering the body.

State the name of **one** mechanical barrier and **one** chemical barrier.

mechanical .....

chemical .....

[2]

(ii) State **one** product of white blood cells that defends the body from pathogens.

..... [1]

[Total: 8]

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12. Nov/2021/Paper_33/No.8

(a) **(i)** State the type of pathogen that can be treated with antibiotics.

..... [1]

(ii) State the **name** of the pathogen that can lead to AIDS.

..... [1]

(b) Many pathogens have developed resistance to some antibiotics. A study took samples of pathogens and tested them for resistance to various types of antibiotics. Fig. 8.1 shows the percentage of pathogens sampled that were resistant to various antibiotics. The samples were taken between 2000 and 2013.

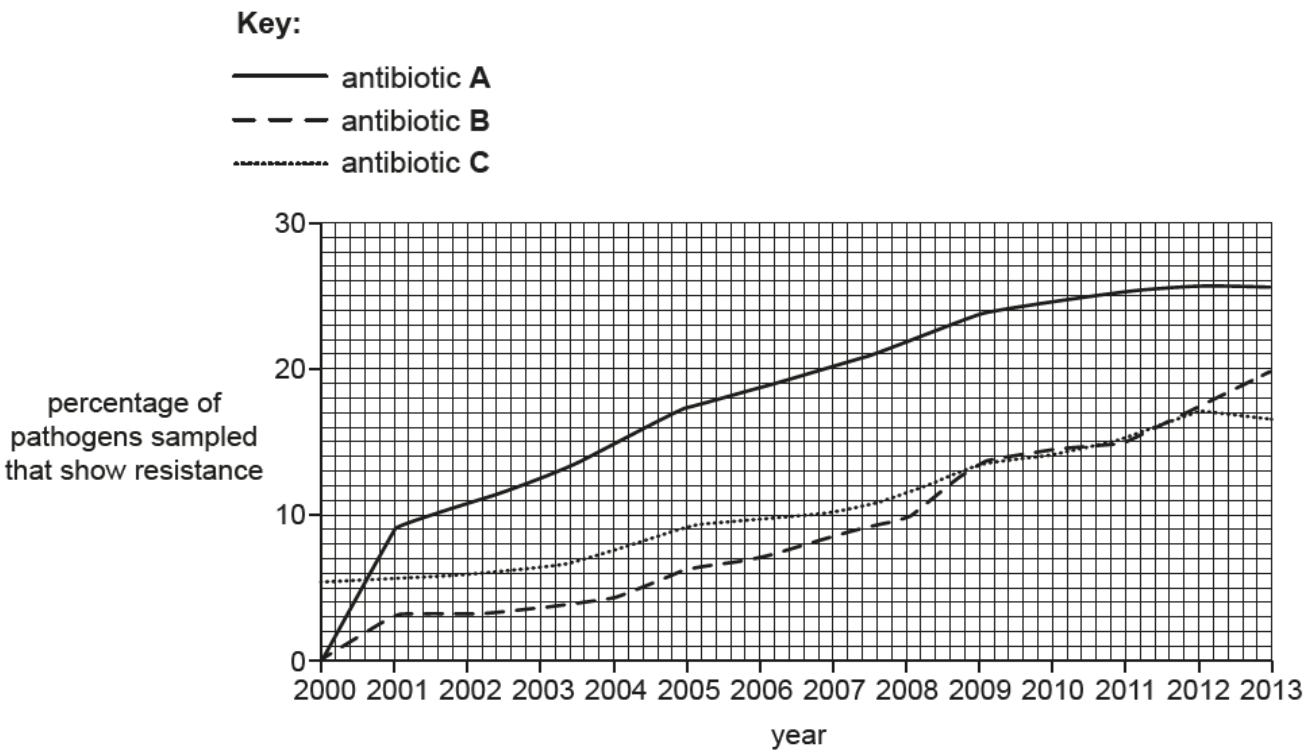


Fig. 8.1

(i) State the meaning of antibiotic resistance.

..... [1]

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(ii) Describe the pattern of resistance for the three antibiotics shown in Fig. 8.1.

.....

.....

.....

.....

.....

.....

..... [3]

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(c) Some medicinal drugs, such as human insulin, can be made using biotechnology and genetic engineering.

(i) State where insulin is produced in humans.

..... [1]

(ii) State the function of insulin in humans.

..... [1]

(d) **(i)** State why bacteria are useful in biotechnology.

.....

.....

.....

.....

..... [2]

(ii) Describe the role of yeast in biotechnology.

.....

.....

.....

.....

.....

.....

..... [3]

[Total: 13]

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13. Nov/2021/Paper_41/No.4

Cholera is a transmissible disease.

(a) State the name of the type of pathogen that causes cholera.

..... [1]

(b) A study was designed to test the effectiveness of a cholera vaccine in an area where outbreaks of cholera occur frequently.

The doctors gave some people in this area the new vaccine.

(i) Suggest what the cholera vaccine must contain to be effective.

.....

.....

..... [1]

(ii) Explain why the people were not protected from cholera immediately after receiving the vaccine.

.....

.....

.....

.....

.....

.....

..... [3]

(iii) The doctors ensured that the people who received the new vaccine had **not** had cholera before.

Suggest why.

.....

.....

..... [1]

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(c) The researchers analysed two pigments, chlorophyll and lycopene, in homozygous red tomato fruit and homozygous yellow tomato fruit. Chlorophyll is found in unripe tomato fruit.

(i) Describe the function of chlorophyll.

.....

.....

.....

.....

..... [2]

(ii) State the name of **one** mineral required for the synthesis of chlorophyll.

..... [1]

(iii) The researchers analysed the concentration of the pigments in tomato fruits:

- before they were ready to eat (unripe)
- when they were ready to eat (ripe).

The results of the analysis are shown in Table 2.1.

Table 2.1

	chlorophyll concentration / mg per g of tomato fruit	lycopene concentration / mg per g of tomato fruit
unripe red fruit	10.0	0.0
ripe red fruit	1.2	105.7
unripe yellow fruit	6.2	0.0
ripe yellow fruit	0.4	0.7

Use the information in Table 2.1 to compare the changes in pigments in red fruit and yellow fruit as they ripen.

.....

.....

.....

.....

.....

.....

..... [3]

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(d) A gene is responsible for the production of lycopene in fruits. Geneticists have recently produced genetically modified pink pineapples using the gene associated with the production of lycopene.

(i) Genes are found at specific locations on an important biological molecule.

State the name of this biological molecule.

..... [1]

(ii) Describe the disadvantages of genetically modifying crops.

.....

.....

.....

.....

..... [2]

[Total: 16]

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14. Nov/2021/Paper_43/No.4

HIV is a pathogen that can cause AIDS.

(a) Describe how HIV is transmitted from one person to another.

.....

.....

.....

.....

.....

.....

..... [3]

(b) All viruses contain genetic material. HIV contains genetic material called RNA.

State **one** other feature common to all viruses.

..... [1]

(c) **(i)** Describe the function of lymphocytes.

.....

.....

.....

.....

.....

.....

..... [3]

(ii) State how infection with HIV affects the lymphocytes if untreated.

.....

..... [1]

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(d) Doctors wanted to determine whether dietary supplements could help people infected with HIV.

They randomly put volunteers with HIV into two groups:

- a treatment group, who received HIV medication and additional vitamin and mineral supplements
- a control group, who received HIV medication but no additional supplements.

The details of the two groups are outlined in Table 4.1.

Table 4.1

	treatment group	control group
total number of volunteers	18	22
average age/years	45.6	46.6
average mass/kg	82.3	82.5

The dietary supplements were given to the treatment group twice a day for three months. The nutrients in the supplements included:

- vitamin C
- vitamin D
- calcium
- iron
- other minerals and vitamins.

(i) Explain why vitamin C and iron are important in the human diet.

.....

.....

.....

.....

.....

.....

.....

.....

..... [4]

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Table 4.2 shows some of the results from the study.

Table 4.2

	treatment group		control group	
	at the start	after three months	at the start	after three months
average number of lymphocytes / cells per µg of blood	357	422	461	461
average number of copies of HIV RNA per cm^3 of blood	4291	897	2648	5935

(ii) Use the data for the treatment group, shown in Table 4.2, to calculate the percentage decrease in the average number of copies of HIV RNA per cm^3 of blood.

Space for working.

.....%
[2]

(iii) Evaluate the effect of the dietary supplements on the lymphocytes.

Use the information in Table 4.2 in your answer.

.....

.....

.....

.....

..... [2]

[Total: 16]

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Diseases and immunity – 2021 IGCSE 0610

1. March/2021/Paper_12/No.21

Which defence prevents pathogens from entering the body?

A antibody production

B mucus

C phagocytosis

D vaccination

2. March/2021/Paper_22/No.28

How do some antibiotics kill bacteria?

A They damage the cell wall.

B They damage the endoplasmic reticulum.

C They damage the nucleus.

D They damage the protein coat.

3. March/2021/Paper_22/No.30

Which types of contact between humans can spread HIV?

1 blood transfusions

2 sexual intercourse

3 saliva

A 1 and 2 only **B** 1 and 3 only **C** 2 and 3 only **D** 1, 2 and 3

4. March/2021/Paper_42/No.5

(a) Measles is a transmissible disease.

The percentage of the population that were vaccinated against measles in a country was determined.

The number of confirmed cases of measles in the country was also recorded.

Fig. 5.1 shows the data that were collected between 1975 and 2010.

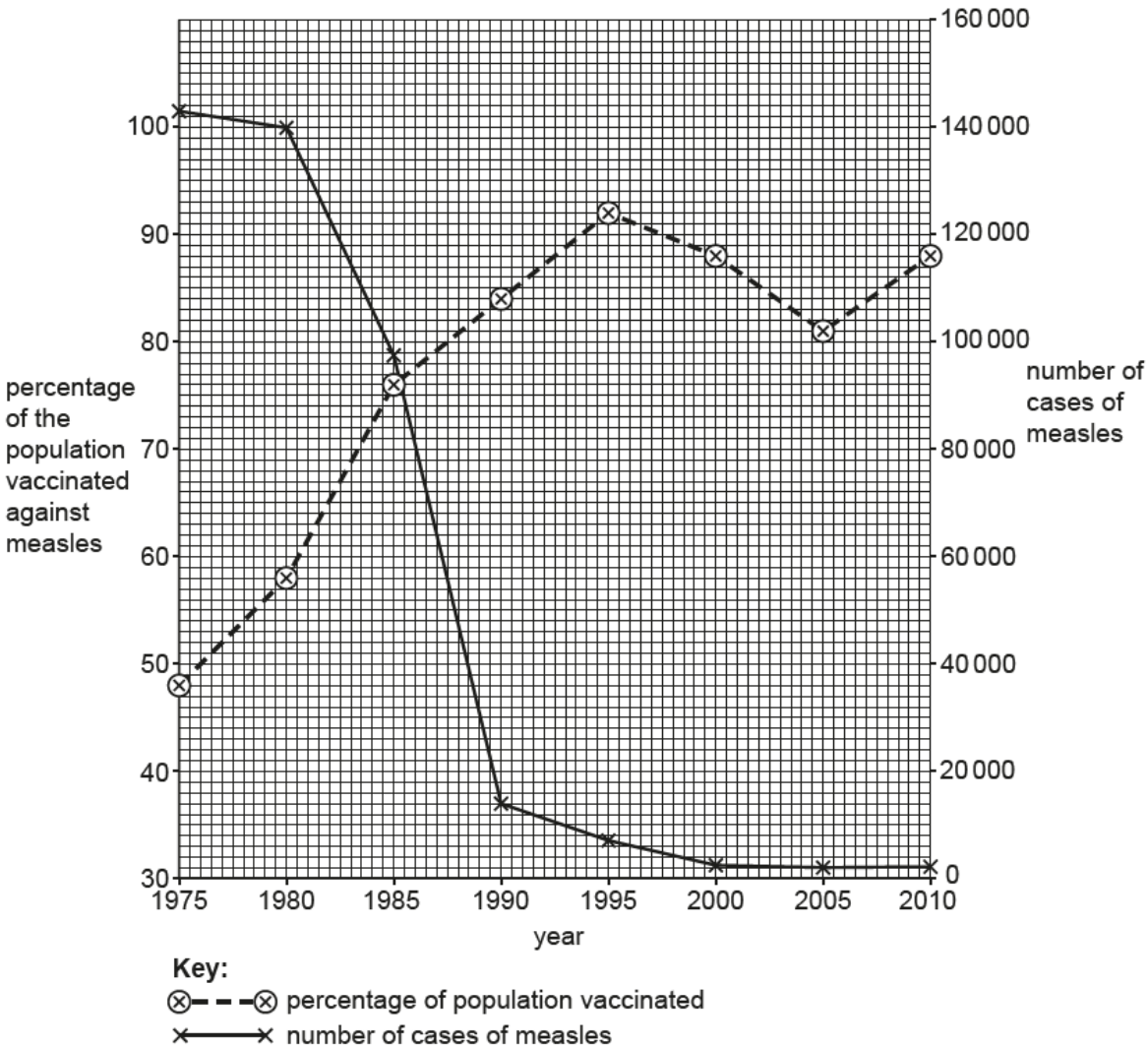


Fig 5.1

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(i) Calculate the percentage change in the number of cases of measles between 1980 and 1990.

Space for working.

.....%
[2]

(ii) Describe the data shown in Fig. 5.1.

.....

.....

.....

.....

.....

.....

.....

.....

..... [4]

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(iii) Explain how vaccination protects people against a transmissible disease such as measles.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

..... [5]

(b) The human body has several defences against pathogens.

(i) State **two** of the body's chemical barriers to pathogens.

1 .....

2 .....

[2]

(ii) Describe the process of blood clotting.

.....

.....

.....

.....

.....

.....

..... [3]

[Total: 16]

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5. June/2021/Paper_11/No.23

The list shows some processes that take place in a human body.

1 production of new red blood cells

2 transmission of nerve impulses from the eyes to the brain

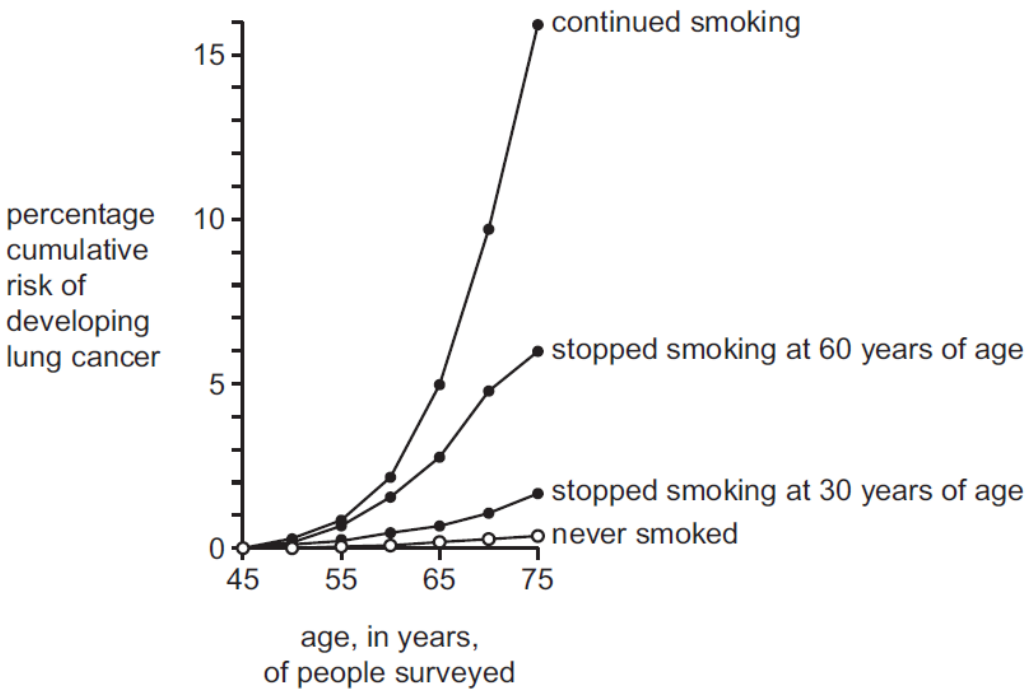
3 diffusion of gases into and out of the lungs

Which processes use energy released by respiration?

A 1 and 2 only **B** 1 and 3 only **C** 2 and 3 only **D** 1, 2 and 3

6. June/2021/Paper_11/No.29

Scientists carried out a survey on the effect of giving up smoking on the risk of developing lung cancer. The results are shown in the graph.



The scientists made three conclusions:

1 Stopping smoking reduces the risk of developing lung cancer.

2 Age increases the risk of lung cancer for smokers and non-smokers.

3 The earlier people stop smoking, the lower the risk.

Which conclusions are correct?

A 1, 2 and 3 **B** 1 and 2 only **C** 1 and 3 only **D** 2 and 3 only

7. June/2021/Paper_12/No.32

How can HIV be transmitted?

A contact with saliva

B drinking water containing untreated sewage

C recessive alleles

D unprotected sexual intercourse with an infected person

8. June/2021/Paper_12/No.33

The diagram shows a specialised cell.



What is the function of this specialised cell?

A asexual reproduction

B conduction of impulses

C movement of mucus in the trachea

D sexual reproduction

9. June/2021/Paper_13/No.3

Scientists discover a new species of animal.

It has a segmented body with two pairs of legs on each segment.

To which group of animals does this new species belong?

A arachnids

B crustaceans

C insects

D myriapods

10. June/2021/Paper_21/No.15

Statements 1 to 4 describe stages in the development of cholera.

1 Chloride ions are secreted into the gut.

2 Osmosis causes water to move into the gut.

3 The infected person becomes dehydrated.

4 Toxins are produced by the pathogenic bacteria.

What is the correct sequence of the four stages?

A $1 \rightarrow 2 \rightarrow 3 \rightarrow 4$

B $1 \rightarrow 4 \rightarrow 3 \rightarrow 2$

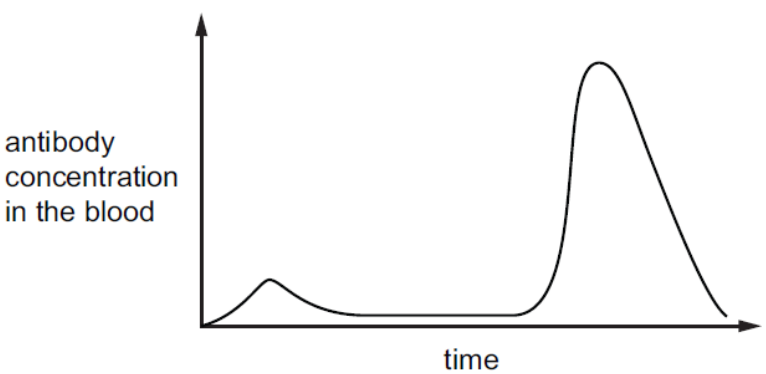
C $4 \rightarrow 1 \rightarrow 2 \rightarrow 3$

D $4 \rightarrow 1 \rightarrow 3 \rightarrow 2$

11. June/2021/Paper_21/No.21

A child is vaccinated against measles. After a period of time the child is infected with the measles virus.

The graph shows the concentration of measles antibodies in the child's bloodstream during this time.



Which statement is consistent with the information in the graph?

A After the vaccination, the child produced memory cells.

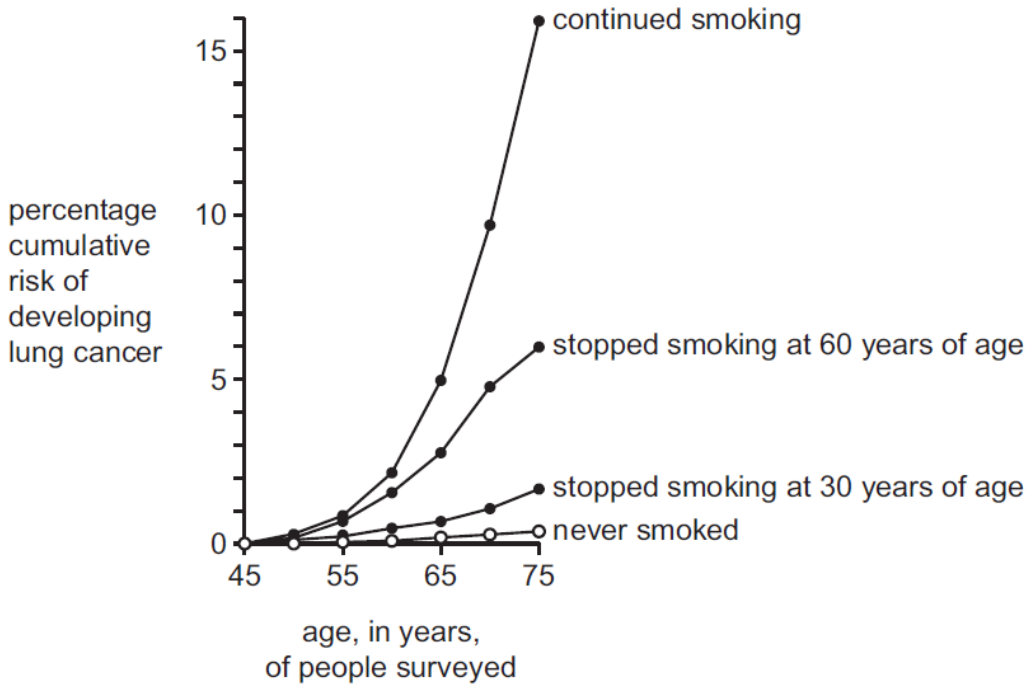
B The child had passive immunity against measles.

C The measles virus contains antibodies.

D The vaccination failed to protect the child against measles.

12. June/2021/Paper_21/No.29

Scientists carried out a survey on the effect of giving up smoking on the risk of developing lung cancer. The results are shown in the graph.



The scientists made three conclusions:

1 Stopping smoking reduces the risk of developing lung cancer.

2 Age increases the risk of lung cancer for smokers and non-smokers.

3 The earlier people stop smoking, the lower the risk.

Which conclusions are correct?

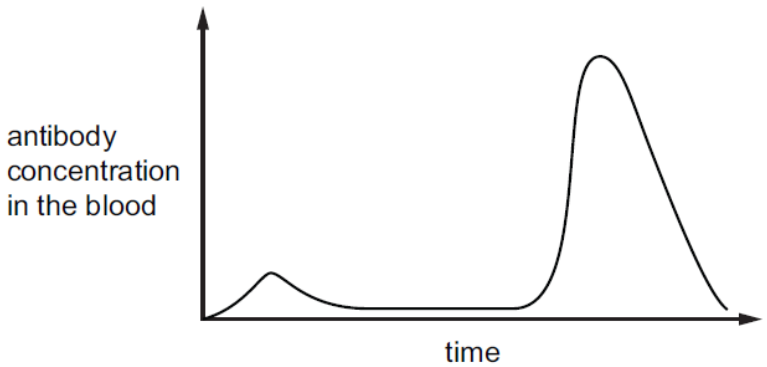
A 1, 2 and 3 **B** 1 and 2 only **C** 1 and 3 only **D** 2 and 3 only

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13. June/2021/Paper_22/No.21

A child is vaccinated against measles. After a period of time the child is infected with the measles virus.

The graph shows the concentration of measles antibodies in the child's bloodstream during this time.



Which statement is consistent with the information in the graph?

A After the vaccination, the child produced memory cells.

B The child had passive immunity against measles.

C The measles virus contains antibodies.

D The vaccination failed to protect the child against measles.

14. June/2021/Paper_22/No.22

Which sequence of changes takes place when we breathe in?

A diaphragm contracts → volume of thorax increases → pressure in lungs decreases

B diaphragm contracts → volume of thorax increases → pressure in lungs increases

C diaphragm relaxes → volume of thorax increases → pressure in lungs decreases

D diaphragm relaxes → volume of thorax increases → pressure in lungs increases

15. June/2021/Paper_23/No.15

Statements 1 to 4 describe stages in the development of cholera.

1 Chloride ions are secreted into the gut.

2 Osmosis causes water to move into the gut.

3 The infected person becomes dehydrated.

4 Toxins are produced by the pathogenic bacteria.

What is the correct sequence of the four stages?

A 1 → 2 → 3 → 4

B 1 → 4 → 3 → 2

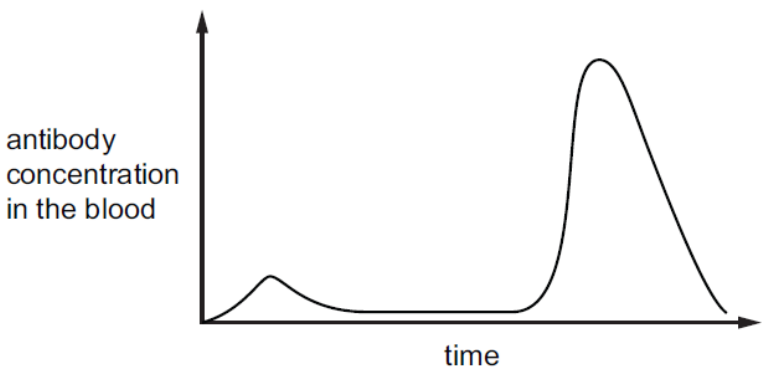
C 4 → 1 → 2 → 3

D 4 → 1 → 3 → 2

16. June/2021/Paper_23/No.21

A child is vaccinated against measles. After a period of time the child is infected with the measles virus.

The graph shows the concentration of measles antibodies in the child's bloodstream during this time.



Which statement is consistent with the information in the graph?

A After the vaccination, the child produced memory cells.

B The child had passive immunity against measles.

C The measles virus contains antibodies.

D The vaccination failed to protect the child against measles.

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17. June/2021/Paper_32/No.7

Measles is an example of a transmissible disease that is caused by a virus.

(a) Complete the definition of transmissible disease.

A transmissible disease is a disease in which the ..... can be passed from one ..... to another.

[2]

(b) Fig. 7.1 is a pie chart showing the number of people infected with four different transmissible diseases in one country in 2018.

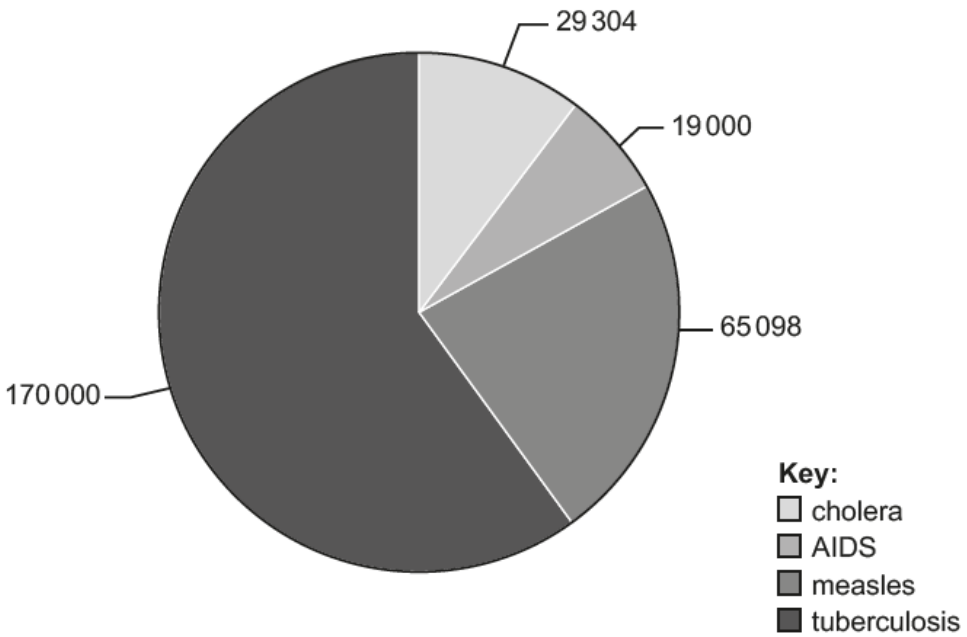


Fig. 7.1

(i) State the name of the disease with the smallest number of infections in Fig. 7.1.

..... [1]

(ii) Use the information in Fig. 7.1 to calculate the total number of people infected with these four diseases.

..... people infected

[1]

(iii) State the type of organism that causes cholera.

..... [1]

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(c) (i) The list shows some examples of ways that disease-causing organisms can be transmitted.

air **animals** **blood**

contaminated surfaces **food**

Complete Table 7.1 to show which are examples of direct contact and which are examples of indirect contact.

Each example can be used once, more than once or not at all.

Table 7.1

direct contact	indirect contact

[2]

(ii) Table 7.2 shows **three** ways the body can defend itself and some examples of the three methods.

Place ticks (✓) in the boxes to show the correct type of defence mechanism for each example.

Table 7.2

example of defence mechanism	cells	chemical	mechanical
antibody production			
hairs in the nose			
mucus			
phagocytosis			
skin			
stomach acid			

[3]

[Total: 10]

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18. June/2021/Paper_41/No.6

(a) Antibodies are proteins that are produced by lymphocytes. Antitoxins are antibodies which neutralise the toxins released by some bacteria.

The transmissible disease diphtheria is caused by a bacterium that releases a toxin that can cause serious damage to the body.

A person is suspected of having caught diphtheria.

At a clinic, the person is given an injection of antitoxin antibodies that provide protection against the diphtheria toxin. She is also given an injection of the vaccine for diphtheria.

A few weeks later she is given a second injection of the diphtheria vaccine.

Fig. 6.1 shows the changes in concentration of the antitoxin antibodies and the antibodies produced in response to the vaccine.

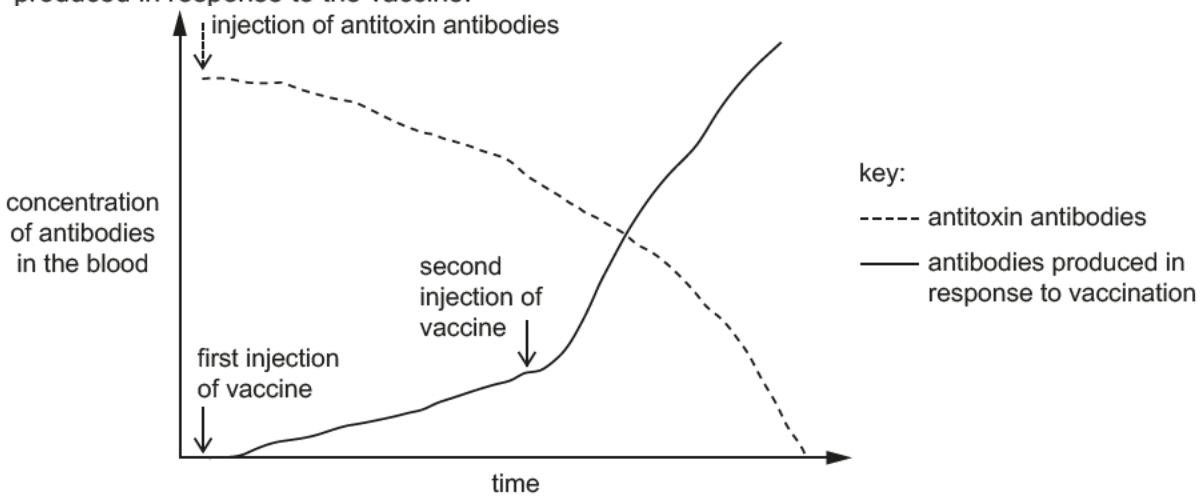


Fig. 6.1

(i) Explain the advantage of giving the person an injection of antitoxin antibodies.

.....

.....

.....

.....

..... [2]

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(ii) Explain how the two injections of the vaccine result in better protection against diphtheria than the injection of antitoxin antibodies.

.....

.....

.....

.....

.....

.....

..... [3]

(b) Explain how antibodies protect the body against pathogens.

.....

.....

.....

.....

.....

.....

.....

.....

..... [4]

(c) Antibodies can travel through the body in the lymphatic system.

State **two** functions of the lymphatic system **other than** defence against disease.

1 .....

2 .....

[2]

[Total: 11]

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Diseases and immunity – 2020 IGCSE 0610

1. Nov/2020/Paper_11/No.20

Which component of the blood releases antibodies in response to an infection by bacteria?

A blood plasma

B platelets

C red blood cells

D white blood cells

2. Nov/2020/Paper_11/No.21

Which is an example of a transmissible disease?

A coronary heart disease caused by eating a high fat diet

B AIDS

C liver disease caused by excessive alcohol consumption

D scurvy

3. Nov/2020/Paper_12/No.21

Which is an example of a transmissible disease?

A coronary heart disease due to eating high fat food

B cholera after drinking contaminated water

C liver damage due to drinking alcohol

D lung cancer due to inhaling tobacco smoke

4. Nov/2020/Paper_13/No.21

The list shows some processes that happen in the human body.

1 water enters cells by osmosis

2 muscles contract

3 impulses travel along neurones

4 oxygen diffuses into cells

Which of these require energy released by respiration?

A 2 only **B** 1 and 3 only **C** 2 and 3 only **D** 1, 2, 3 and 4

5. Nov/2020/Paper_13/No.31

Which method of birth control would also help to protect against HIV?

A condom

B contraceptive pill

C diaphragm

D IUD

6. Nov/2020/Paper_21/No.19

The sequence of amino acids in antibodies enables them to complete which function?

A bind to a specific antigen

B bind to all pathogens

C perform phagocytosis

D confer passive immunity for all diseases

7. Nov/2020/Paper_22/No.19

A patient was injected with antibodies after being bitten by a poisonous snake. The patient recovered and survived.

What describes the effect in the patient's body?

	active immunity	passive immunity	memory cells produced
A	✓	✗	✓
B	✓	✗	✗
C	✗	✓	✓
D	✗	✓	✗

key

✓ = yes

✗ = no

8. Nov/2020/Paper_23/No.19

A baby acquires protection from pathogens from its mother's breast milk.

What is this protection called?

A active immunity

B immunisation

C vaccination

D passive immunity

9. Nov/2020/Paper_31/No.4

(a) A scientist investigated how the growth of plant shoots was affected by the direction of light.

A light source was placed on one side of a shoot and the scientist recorded the appearance of the shoot after a few days.

Fig. 4.1 shows his results.

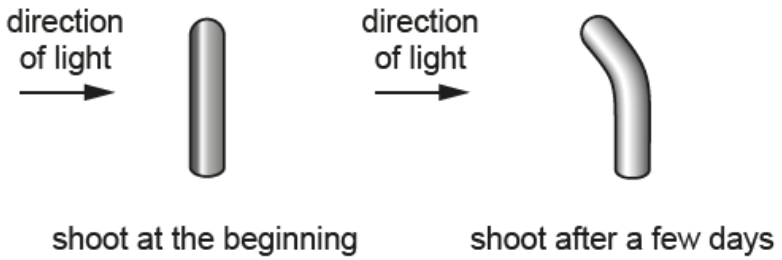


Fig. 4.1

(i) Describe the results shown in Fig. 4.1.

.....

.....

..... [1]

(ii) State the name of the response to light shown in Fig. 4.1.

..... [1]

(iii) Explain the advantage to a plant of the response shown in Fig. 4.1.

.....

.....

.....

.....

..... [2]

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(b) Plant roots absorb mineral ions by active transport.

(i) Define the term active transport.

.....

.....

.....

..... [3]

(ii) State the importance of these mineral ions in plants.

magnesium ions .....

.....

.....

nitrate ions .....

.....

.....

[2]

(c) State **two** uses of water in plants.

1 .....

2 .....

[2]

[Total: 11]

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10. Nov/2020/Paper_32/No.6

(a) Define the term drug.

.....

.....

..... [2]

(b) Antibiotics are a type of drug.

State the type of infection antibiotics are used to treat.

..... [1]

(c) Table 6.1 shows the year in which three different types of antibiotics were first used and the year that antibiotic resistance was first detected.

Table 6.1

antibiotic	year of first use	year resistance first detected
A	1952	1988
B	1962	1973
C	2000	2003

Compare the data for the three antibiotics in Table 6.1.

.....

.....

.....

.....

.....

.....

..... [3]

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(d) The body has defences against infections caused by pathogens.

State **three** body defences that prevent pathogens from entering the body.

1 .....

2 .....

3 .....

[3]

[Total: 9]

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11. Nov/2020/Paper_41/No.2

(a) Fig. 2.1 shows some cells that are part of the human immune system. These cells are responding to one type of pathogen.

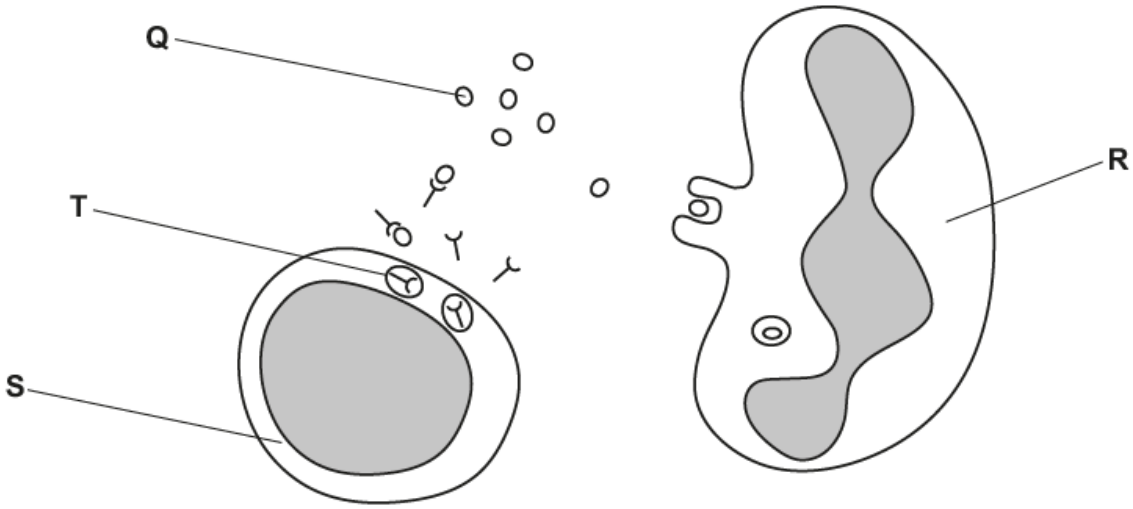


Fig. 2.1

Explain how the immune system responds to an invasion of pathogens.

Use the letters in Fig. 2.1 in your answer.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

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.....

.....

.....

..... [6]

(b) A vaccine was introduced in 1942 for a particular disease.

Fig. 2.2 shows the effect of introducing the vaccine on the number of cases of the disease in one country.

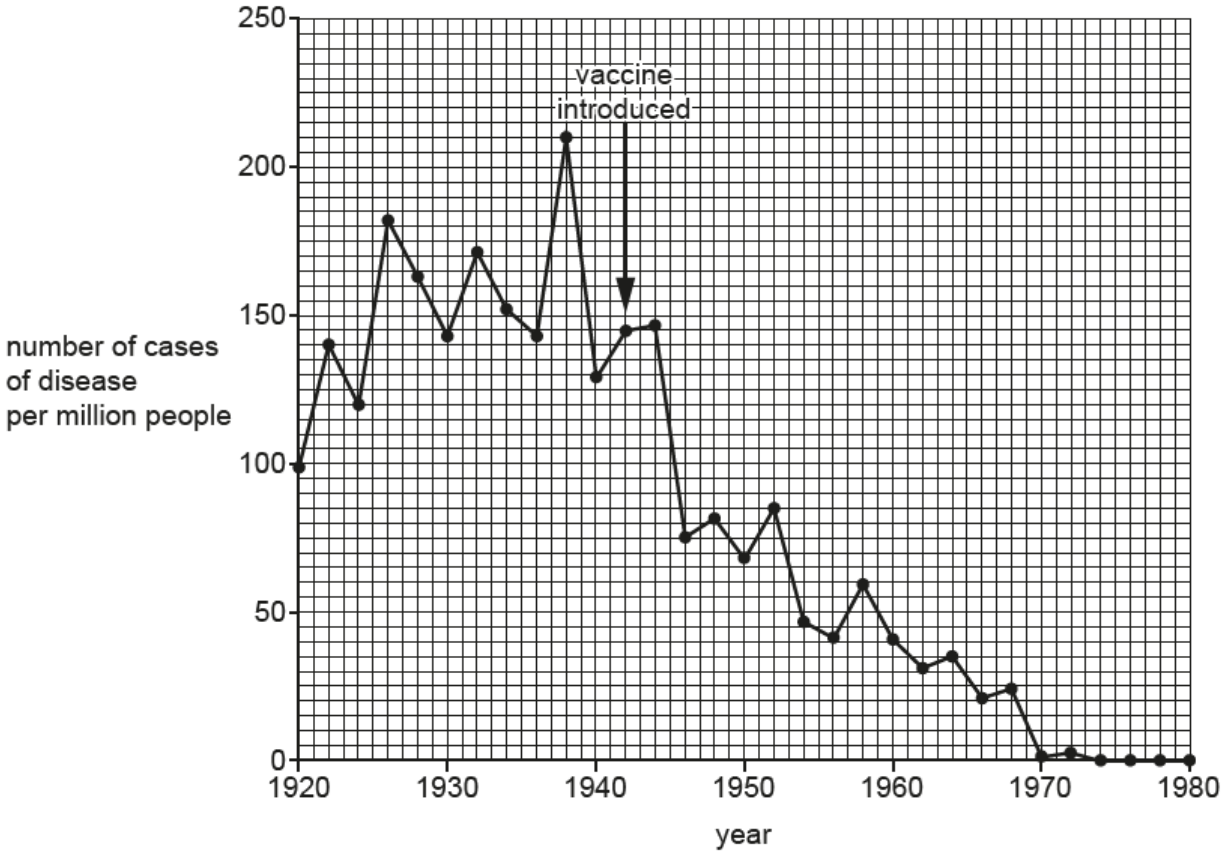


Fig. 2.2

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In 1946 the government of the country concluded that the vaccine was successful.

Discuss the evidence, shown in Fig. 2.2, for **and** against this conclusion.

.....

.....

.....

.....

.....

.....

.....

.....

..... [4]

[Total: 10]

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Diseases and immunity – 2020 IGCSE 0610

1. March/2020/Paper_12/No.21

Which disease is transmissible?

A cholera

B chronic obstructive pulmonary disease

C lung cancer

D scurvy

2. March/2020/Paper_22/No.14

The list shows some human health problems.

1 chronic obstructive pulmonary disease

2 constipation

3 coronary heart disease

4 obesity

Which problems can be caused by malnutrition?

A 1, 2 and 3 **B** 1 and 3 only **C** 2, 3 and 4 **D** 2 and 4 only

3. March/2020/Paper_22/No.15

Cholera infection can cause the following events:

1 cells lining the small intestine secrete chloride ions

2 cholera bacteria produce a toxin

3 chloride ions move into the small intestine

4 water from the blood moves into the small intestine by osmosis

5 water potential of fluid in the small intestine becomes lower.

Which sequence of events will cause diarrhoea?

A 1 → 3 → 2 → 4 → 5

B 2 → 1 → 3 → 5 → 4

C 3 → 1 → 4 → 5 → 2

D 2 → 3 → 1 → 4 → 5

4. March/2020/Paper_22/No.2

Using the binomial naming system, the Arctic fox is called *Vulpes lagopus*.

Which row is correct?

	Vulpes	*lagopus*
A	genus	kingdom
B	genus	species
C	species	genus
D	species	kingdom

5. June/2020/Paper_11/No.17

What is a chemical barrier to pathogens?

A nose hairs

B skin

C stomach acid

D white blood cells

6. June/2020/Paper_11/No.26

Which type of infection could be treated successfully with antibiotics?

	infection caused by		
	bacteria	resistant bacteria	viruses
A	✓	✓	✗
B	✓	✗	✗
C	✗	✓	✓
D	✗	✗	✓

key

✓ = yes

✗ = no

7. June/2020/Paper_12/No.17

What is a chemical barrier to pathogens?

A nose hairs

B skin

C stomach acid

D white blood cells

8. June/2020/Paper_12/No.26

Which statement about antibiotic use in humans is correct?

A Different types of antibiotic are used to remove antibodies from the body.

B Antibiotics are injected in childhood to prevent diseases in adults.

C Antibiotics are used to treat diseases caused by viruses.

D Different types of antibiotic are used because bacteria can become resistant.

9. June/2020/Paper_13/No.17

What is a chemical barrier to pathogens?

A nose hairs

B skin

C stomach acid

D white blood cells

10. June/2020/Paper_13/No.30

Which disease is an example of an STI?

A cholera

B COPD

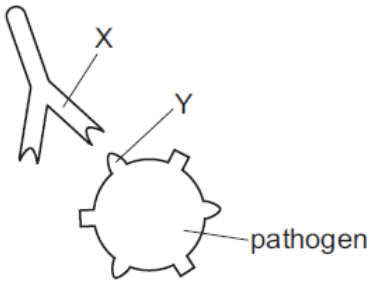
C HIV

D lung cancer

11. June/2020/Paper_21/No.19

When a pathogen enters the blood, the immune system uses different mechanisms to destroy the pathogen.

The diagram shows one of these mechanisms.



Which row describes the structures involved?

	structure X	X is made by	structure Y
A	antigen	lymphocytes	antibody
B	antigen	phagocytes	antibody
C	antibody	lymphocytes	antigen
D	antibody	phagocytes	antigen

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12. June/2020/Paper_21/No.27

The statements are about the use of antibiotics.

1 using an antibiotic to prevent infection

2 using an antibiotic known to kill the bacteria causing an infection

3 using an antibiotic only when essential

4 using an antibiotic to treat a viral infection

Which practices will increase the chance of the development of antibiotic resistance in bacteria?

A 1, 2, 3 and 4 **B** 1 and 4 only **C** 2 and 3 only **D** 2 and 4 only

13. June/2020/Paper_22/No.20

The formula C_2H_5OH represents a chemical produced during anaerobic respiration.

What is this chemical?

A alcohol

B glucose

C glycogen

D lactic acid

14. June/2020/Paper_22/No.19

The following are statements about immunity.

1 The transfer of antibodies from mother to baby in breast milk is an example of passive immunity.

2 Passive immunity results in long term immunity because of the production of memory cells.

3 Active immunity is gained after vaccination with antigens.

Which statements are correct?

A 1, 2 and 3 **B** 1 and 2 only **C** 1 and 3 only **D** 2 and 3 only

15. June/2020/Paper_23/No.19

Vaccinations can be given to gain active immunity.

Which statement about this type of vaccination is correct?

A The vaccination contains antibodies.

B The vaccination must contain harmful pathogens.

C The vaccination triggers antibody production in the body.

D The vaccination triggers antigen production in the body.

16. June/2020/Paper_23/No.26

Which disease is caused by a virus?

A AIDS

B kwashiorkor

C cholera

D MRSA infection

17. June/2020/Paper_43/No.5

Bacteria are classified in the Prokaryote kingdom.

(a) State **two** features of animal **and** plant cells that are **not** found in prokaryotes.

1 .....

2 .....

[2]

(b) Methicillin-resistant *Staphylococcus aureus* (MRSA) is a type of bacterium that is resistant to some antibiotics.

Fig. 5.1 shows how a population of bacteria may develop antibiotic resistance and how the antibiotic resistance can be passed from one strain of bacterium to another.

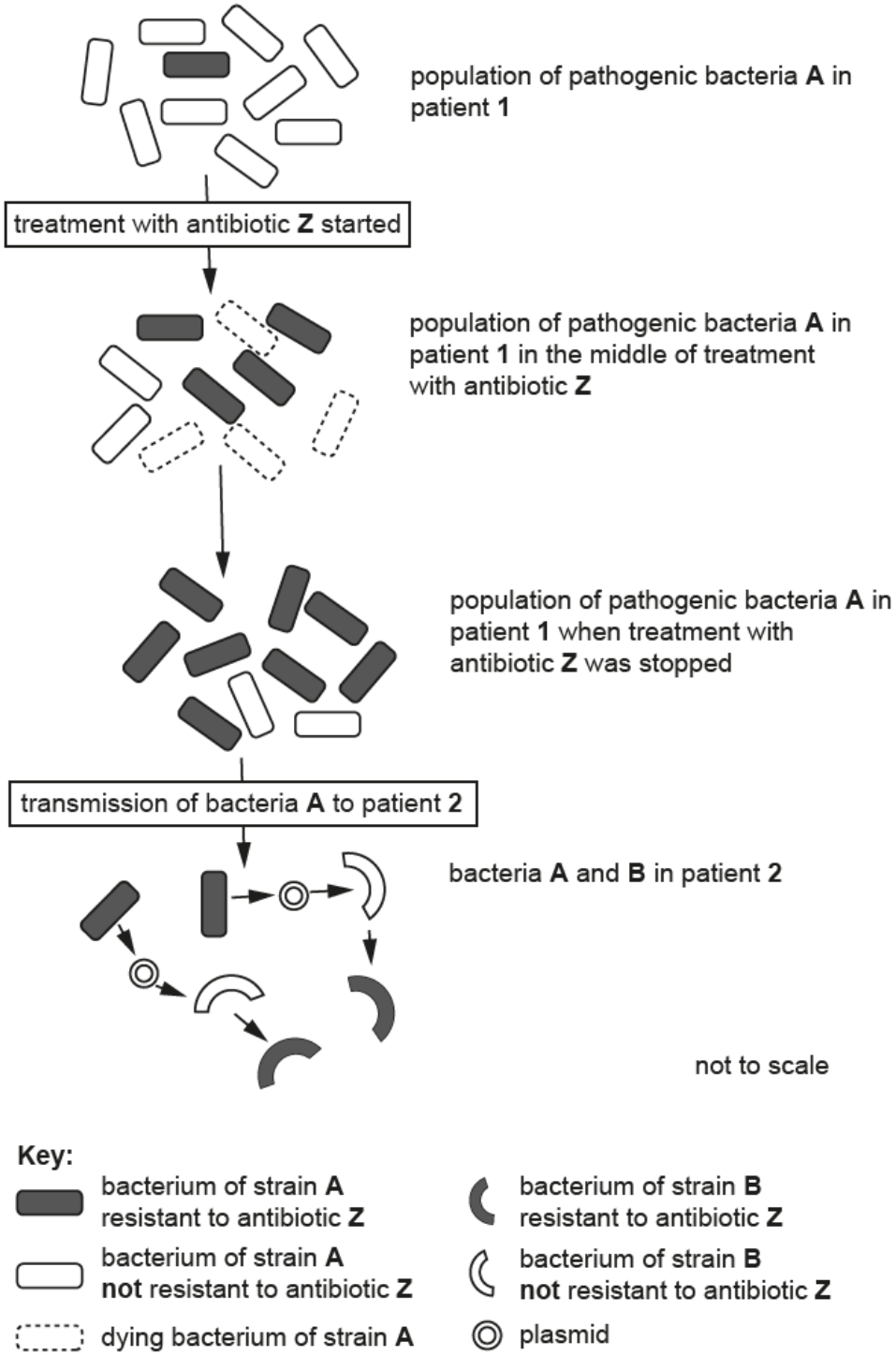


Fig. 5.1

Explain how resistance to an antibiotic develops in a population of bacteria and spreads in the human population.

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..... [6]

(c) Explain how the development of resistant bacteria, such as MRSA, can be minimised.

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..... [3]

[Total: 11]

1 What is the function of lymphocytes in the blood?

A antibody production

B blood clotting

C phagocytosis

D transport of hormones

2 Which part of a pathogen is recognised by the immune system?

A active site

B antibiotic

C antibody

D antigen

3 When a tissue from a man is grafted onto a woman it may be rejected by the woman's body.

What is the main cause of this rejection?

A antibody production

B phagocytosis

C the action of antibiotics

D the presence of a Y chromosome

4 The antibodies that give immunity to a disease can be acquired in the following different ways.

1 feeding on breast milk

2 infection by disease

3 vaccination

Which give active immunity?

A 1 and 2 only

B 1 and 3 only

C 2 and 3 only

D 1, 2 and 3

5 Which row describes the features of passive immunity?

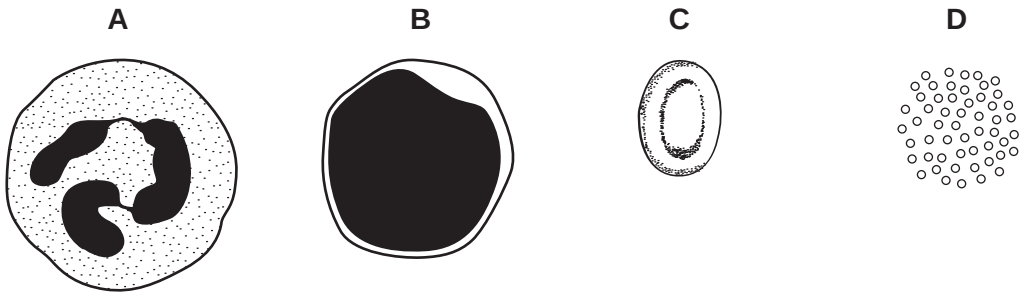
	antibodies made	involves memory cells	effective period
A	no	no	short term
B	no	yes	short term
C	yes	no	long term
D	yes	yes	long term

6 What happens when a child is vaccinated against tuberculosis?

	type of immunity	production of memory cells
A	active	no
B	active	yes
C	passive	no
D	passive	yes

7 The diagram shows some parts from the blood of a mammal.

Which part would contain the breakdown products of bacterial cells?



8 Which are both chemical barriers to the transmission of pathogens?

A mucus and stomach acid

B mucus and white blood cells

C skin and hairs in the nose

D skin and stomach acid

9 Which is a mechanical barrier to pathogens?

A acid in the stomach

B hairs in the nose

C mucus in the trachea

D phagocytosis in the blood

10 Which disease is caused by bacteria?

A AIDS

B cholera

C obesity

D scurvy

11 What can be passed from one person to another during blood transfusion?

A cholera

B chronic obstructive pulmonary disease (COPD)

C HIV

D scurvy

12 Which are both chemical barriers to the transmission of pathogens?

A mucus and stomach acid

B mucus and white blood cells

C skin and hairs in the nose

D skin and stomach acid

13 The immune system recognises pathogens and attacks them.

Which feature of pathogens triggers this response?

A antibodies

B antibiotics

C antigens

D memory cells

14 What is an example of a transmissible disease?

A COPD

B HIV

C scurvy

D tooth decay

15 What is a disease-causing organism called?

A antibody

B host

C pathogen

D phagocyte

16 Which body defence is a chemical barrier?

A antibody production

B hairs in the nose

C mucus lining the airways

D skin

17 What is a pathogen?

A a bacterium

B a disease-causing organism

C a disease that is transmissible

D a white blood cell that engulfs bacteria

18 What is a common feature of both active and passive immunity?

A They are acquired by vaccination.

B They are always short-term.

C They involve the activity of memory cells.

D They involve antibodies.