10. Diseases and immunity

10.1 Diseases and immunity

Paper 1 and 2

Question Paper

Paper 1

Questions are applicable for both core and extended candidates

1 Some methods of transmitting pathogens are listed.

1 drinking contaminated water

2 contact with another person's blood

3 contact with another person's saliva

4 touching contaminated surfaces

How many are **indirect** methods of transmitting pathogens?

A none

B one

C two

D three

2 What is a direct way of transmitting a pathogen?

A by contact with contaminated air

B by contact with contaminated blood

C by contact with contaminated food

D by contact with contaminated surfaces

3 Which method of pathogen transmission is direct?

A breathing in pathogens in air

B eating contaminated food

C transfusing contaminated blood

D touching a door handle that has pathogens on it

4 Which type of cells produce antibodies?

A ciliated cells

B platelets

C red blood cells

D white blood cells

5 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

6 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

7 Which statement describes a transmissible disease?

A a disease caused when a pathogen passes from one host to another

B a disease caused when a pathogen passes through a host's body

C a disease caused when a pathogen passes to the host's body only by direct contact

D a disease caused when a pathogen passes to the host's body only by indirect contact

8 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

9 *Campylobacter* is a bacterium that can cause food poisoning.

Which word describes *Campylobacter*?

A antibody

B disease

C pathogen

D symptom

10 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

11 Which disease is caused by a pathogen?

A cholera

B coronary heart disease

C lung cancer

D scurvy

12 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?

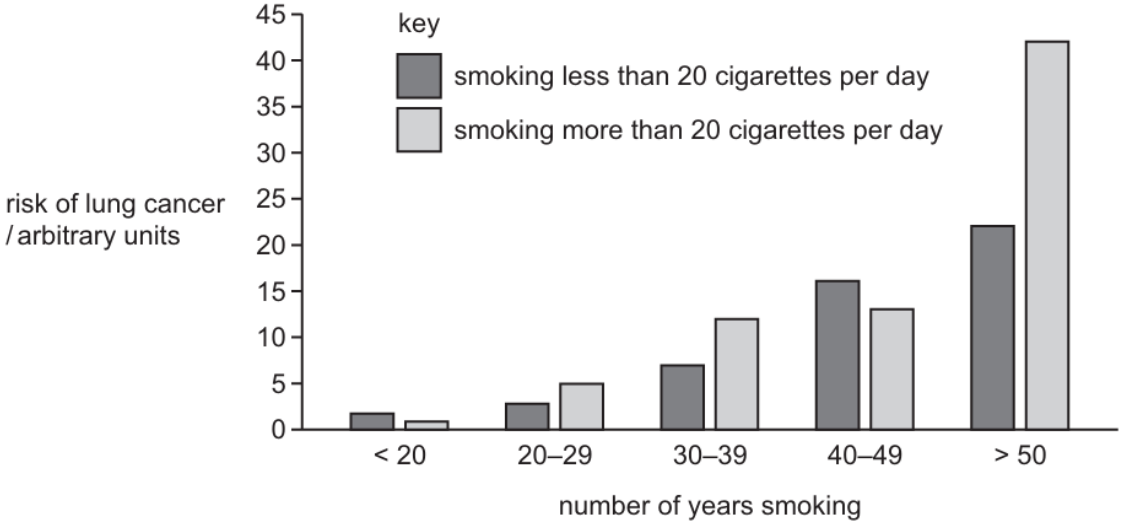
A 1, 2, 3 and 4

B 1, 2 and 3 only

C 2 and 3 only

D 4 only

13 The graph shows how smoking different numbers of cigarettes for different lengths of time affects the risk of lung cancer.



Which conclusions are supported by the data in the graph?

1 Smoking more than 20 cigarettes per day always increases the risk of lung cancer more than smoking less than 20 cigarettes per day.

2 Smoking cigarettes for more years increases the risk of lung cancer.

3 Smoking more than 20 cigarettes per day for more than 50 years has the highest risk of lung cancer.

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

14 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

15 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

16 Which type of organism causes tooth decay?

A arachnid

B bacterium

C producer

D virus

17 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

18 What is a chemical barrier to pathogens?

A nose hairs

B skin

C stomach acid

D white blood cells

19 A pathogen is defined as

A a contaminated surface or food.

B a disease-causing organism.

C a transmissible disease.

D a virus.

20 The body has several defence mechanisms to protect the body against disease.

Which is a chemical barrier?

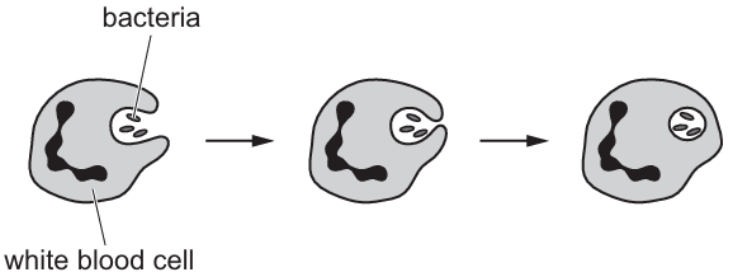
A hair in the nose

B mucus

C skin

D white blood cells

21 The diagram shows one way the body defends itself against pathogens.



What is the name of this defence mechanism?

A antibody production

B egestion

C phagocytosis

D vaccination

22 A person suffering from influenza was given antibiotics. Influenza is caused by a virus.

Why did the antibiotics **not** cure the person with influenza?

A Antibiotics do not affect viruses.

B The antibiotic course was not long enough.

C The influenza virus became resistant to the antibiotics.

D The person was immune to antibiotics.

23 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

Paper 2

Questions are applicable for both core and extended candidates unless indicated in the question

24 One of the symptoms of the disease cholera is diarrhoea. This is due to water loss by osmosis caused by the cholera toxin.

What is the effect of cholera toxins that results in diarrhoea? **(extended only)**

A secretion of chloride ions out of the small intestine lowering the water potential

B secretion of chloride ions out of the small intestine raising the water potential

C secretion of chloride ions into the small intestine lowering the water potential

D secretion of chloride ions into the small intestine raising the water potential

25 Which statement about immunity is correct? **(extended only)**

A A part of the antibody molecule has the same shape as the antigen it acts on.

B Babies develop passive immunity from the antibodies they receive in breast milk.

C Phagocytes produce antibodies.

D Vaccines contain weakened antibodies.

26 Which component of blood produces antibodies?

A plasma

B platelets

C red blood cells

D white blood cells

27 The cholera bacterium produces a toxin which affects humans.

What is an effect of this toxin on the human body? **(extended only)**

A the secretion of chloride ions from the blood into the lumen of the large intestine

B the secretion of chloride ions from the blood into the lumen of the small intestine

C the secretion of chloride ions from the lumen of the large intestine into the blood

D the secretion of chloride ions from the lumen of the small intestine into the blood

28 Which features of the human body protect against pathogens in food?

	red blood cells	stomach acid	white blood cells
A	yes	yes	no
B	yes	no	no
C	no	yes	yes
D	no	no	yes

29 Which statement about immunity is correct? **(extended only)**

A Antibodies are present on the surface of pathogens.

B Antibodies are produced by lymphocytes.

C Antigens are produced by memory cells.

D Antigens are produced by phagocytes.

30 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? **(extended only)**

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

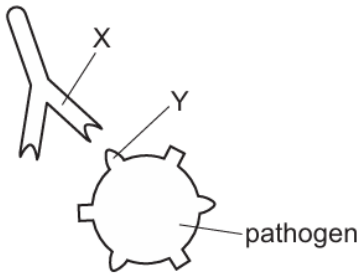
key

✓ = yes

✗ = no

31 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? **(extended only)**

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

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

Which statement explains the reason for this? **(extended only)**

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.

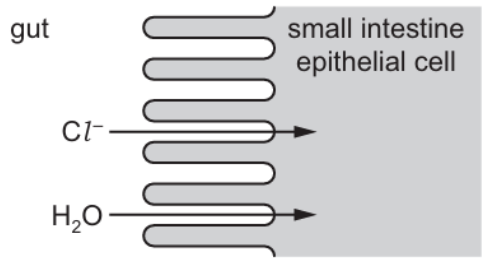
C Chloride ions are secreted into the small intestine which causes water to move out of the intestine by osmosis.

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

33 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)? **(extended only)**

A



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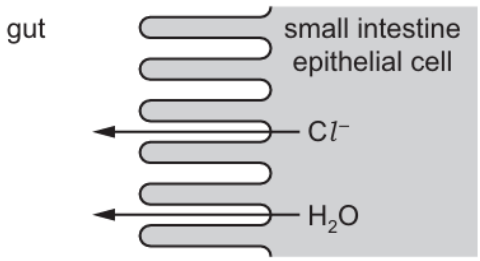

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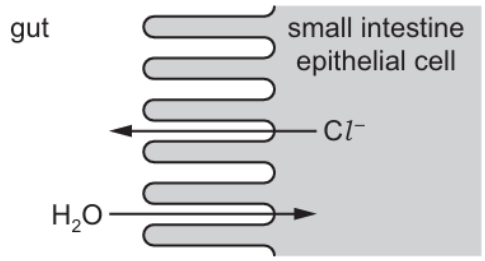
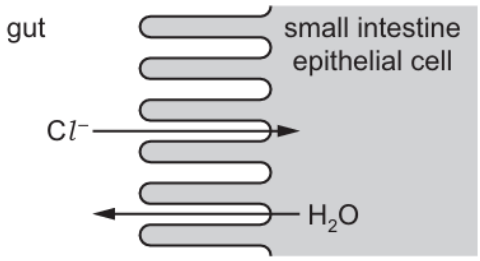


D



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

1 mucus

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Which features can prevent pathogens entering body tissues?

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35 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? **(extended only)**

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

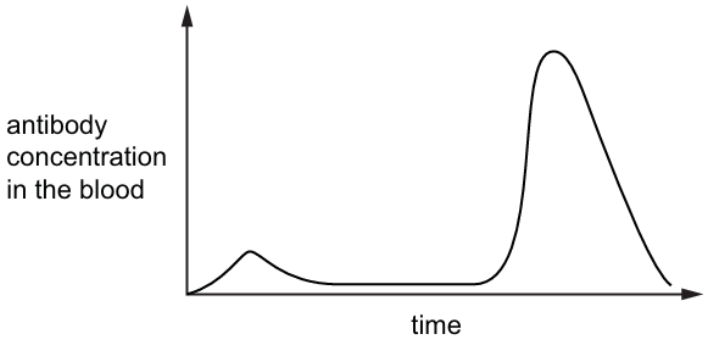
B $1 \rightarrow 4 \rightarrow 3 \rightarrow 2$

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

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

36 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? **(extended only)**

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.

37 The sequence of amino acids in antibodies enables them to complete which function? **(extended only)**

A bind to a specific antigen

B bind to all pathogens

C perform phagocytosis

D confer passive immunity for all diseases

38 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? **(extended only)**

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

key
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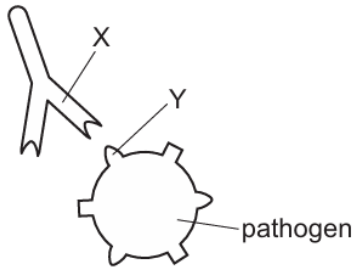

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D	antibody	phagocytes	antigen

40 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? **(extended only)**

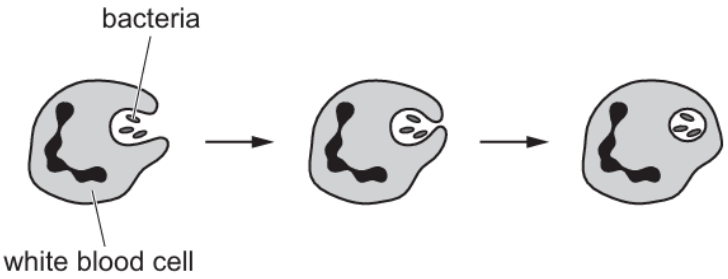
A 1, 2 and 3 **B** 1 and 2 only **C** 1 and 3 only **D** 2 and 3 only

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

How does this affect the water potential of blood in the intestinal capillaries and the intestinal contents? **(extended only)**

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

42 The diagram shows one way the body defends itself against pathogens.



What is the name of this defence mechanism? **(extended only)**

A antibody production

B egestion

C phagocytosis

D vaccination

43 Which row describes the features of passive immunity? **(extended only)**

	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