10. Infectious Diseases

10.1 Infectious diseases

Paper 1

Question Paper

1 A scientist investigated the effect of an antibiotic on the treatment of cholera.

320 people with cholera were divided into two groups. One group was treated with the antibiotic while the other group was not given the antibiotic. Both groups were given fluids containing sugars and mineral salts (oral rehydration therapy).

The scientist recorded the number of days that each person had diarrhoea.

The table shows the results.

treatment	mean time person had diarrhoea / days
antibiotic and oral rehydration therapy	3.2
oral rehydration therapy	5.3

What is the percentage decrease in the mean time that a person had diarrhoea when they were treated with the antibiotic?

A 39.6% **B** 60.4% **C** 165.6% **D** 252.4%

2 Which disease does *Mycobacterium bovis* cause?

A cholera

B HIV / AIDS

C malaria

D tuberculosis

3 Three statements about cholera and its transmission are listed.

1 The pathogen causes watery faeces.

2 Frequent air flight has led to mobile populations.

3 The pathogen is transmitted through water.

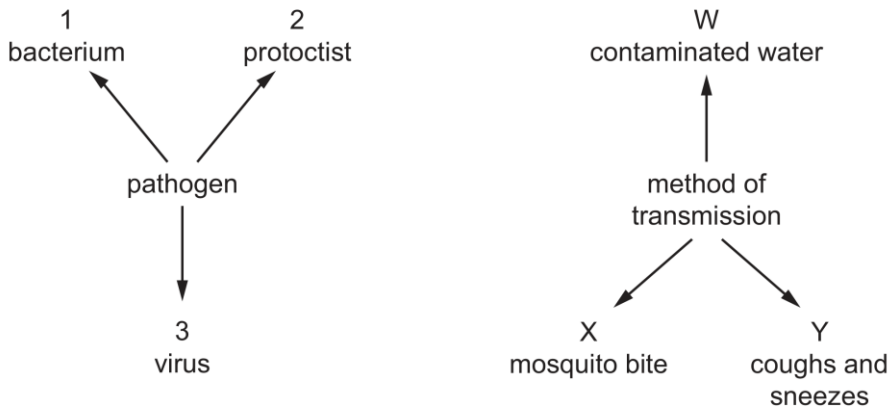
Which statements are reasons why outbreaks of cholera are likely to occur?

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

4 Which row is correct for the control or prevention methods for each disease?

	TB	malaria	cholera
A	vaccination	chlorination of water	vaccination
B	chlorination of water	contact tracing	destruction of the vector
C	contact tracing	destruction of the vector	chlorination of water
D	destruction of the vector	vaccination	contact tracing

5 The diagram shows some of the pathogens that cause disease in humans and some of the ways they are transmitted.



What is the correct pathogen and method of transmission for malaria?

A 1 and X **B** 2 and W **C** 2 and X **D** 3 and Y

6 The average sizes of some pathogens are shown.

pathogen	average size / nm
HIV particle	100
Mycobacterium tuberculosis	3 000
Plasmodium	20 000
Vibrio cholerae	1 500

One type of air filter has been shown to be effective at preventing any pathogens of 1 μm or larger from entering the air system of a room.

Based on their size **and** mode of transmission, which diseases would the air filter prevent from entering the air system of a room?

	HIV infection	TB	malaria	cholera
A	✗	✓	✓	✓
B	✗	✗	✓	✓
C	✓	✗	✗	✗
D	✗	✓	✗	✗

key
✓ = prevented
✗ = not prevented

7 Which statement is correct?

A Cholera is caused by the virus *Vibrio cholerae*.

B Mosquitoes are pathogens that cause malaria.

C *Mycobacterium bovis* only causes TB in humans.

D *Plasmodium vivax* is an example of a protoctist.

8 Which statement correctly describes infectious diseases?

A They are diseases caused by environmental factors that are not passed from one person to another.

B They are diseases caused by a fault in the DNA that can be passed from a parent to their offspring.

C They are diseases caused by a lack of a nutrient in the diet, such as a vitamin or mineral.

D They are diseases caused by a pathogen such as a bacterium, fungus, protoctist or virus.

9 Why is it difficult to control the spread of tuberculosis?

1 Global air travel for commerce and tourism has increased.

2 The bacterium that causes tuberculosis has evolved resistance to some antibiotics.

3 The bacterium that causes tuberculosis shows great antigenic variability.

4 Civil unrest and poverty result in overcrowded living conditions.

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

10 Cholera and tuberculosis are infectious diseases that can spread when people have to live in overcrowded conditions.

Which strategies would help control the spread of cholera **and** tuberculosis?

1 covering food to prevent flies landing on it

2 providing chlorinated drinking water

3 treating severe cases with antibiotics

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

11 Which row shows the correct methods of transmission of the named pathogens?

	method of transmission		
	airborne droplets	insect vector	water
A	*Morbillivirus*	*Mycobacterium*	*Vibrio*
B	*Mycobacterium*	*Plasmodium*	*Vibrio*
C	*Plasmodium*	*Vibrio*	*Morbillivirus*
D	*Vibrio*	*Plasmodium*	*Mycobacterium*

12 Which disease is caused by a eukaryote?

A cholera

B malaria

C measles

D smallpox

13 Which disease is spread by a vector?

A AIDS / HIV

B cholera

C malaria

D measles

14 Some features of a disease are listed.

- It can be transmitted by animals to other animals, including humans.
- One mode of transmission is by transfusion with contaminated blood.
- The causative organism can show multiple drug resistance.
- The majority of humans who die from the disease are children.

Which disease has all these features?

A cholera

B HIV / AIDS

C malaria

D tuberculosis

15 The following advice was given to a person travelling to a country where there had been an outbreak of an infectious disease.

- Cook food well and eat it hot.
- Peel fruit and vegetables.
- Drink only cool, boiled water.
- Wash hands often with soap and cool, boiled water.

Which infectious disease would this advice help to protect against?

A cholera

B malaria

C measles

D tuberculosis

16 Which control measures would reduce the transmission of tuberculosis (TB)?

	boiling water before drinking it	antibiotics	vaccination
A	yes	no	no
B	yes	yes	yes
C	no	yes	no
D	no	yes	yes

17 Comorbidity is where an individual has two or more diseases or medical conditions at the same time. Some medical conditions are particularly likely to result in comorbidity. In one example, initial infection with one pathogen can increase the risk of developing a second disease by a factor of 15 or more. The second disease is then the major cause of death for these people.

Which description could fit this example?

A cholera infection followed by development of malaria

B cholera infection followed by development of AIDS

C HIV infection followed by development of TB

D malaria infection followed by development of TB

18 Which conditions are infectious **and** result in a high white blood cell count?

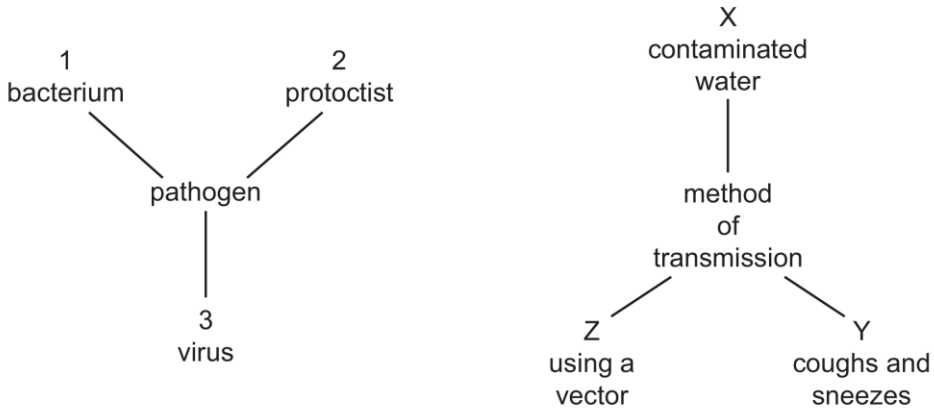
1 leukaemia

2 myasthenia gravis

3 TB

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

19 The diagram shows some of the pathogens that cause disease in humans and some of the ways they are transmitted.



Which row matches the correct number for the pathogen with the correct letter for their mode of transmission for cholera and measles?

	cholera	measles
A	1 and X	3 and Y
B	1 and Y	3 and Y
C	2 and X	2 and Z
D	3 and Z	1 and X

20 Which factors would increase the global distribution of malaria?

1 a fall in annual rainfall

2 an increase in the use of antibiotics

3 a rise in global air temperatures

4 increasing irrigation of land for farming

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

21 Which of these causative agents of disease can be transmitted by droplet infection?

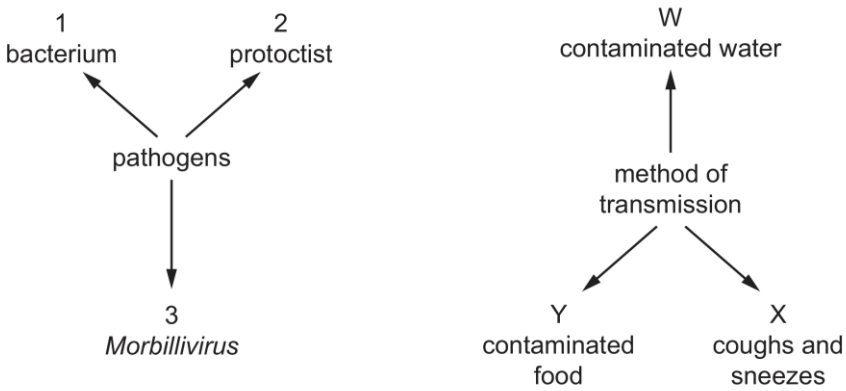
1 *Vibrio*

2 *Mycobacterium*

3 *Morbillivirus*

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

22 The diagrams show some of the pathogens that cause disease in humans and some of the ways they are transmitted.



What is the correct pathogen and method of transmission for the disease TB?

A 1 and W **B** 1 and X **C** 2 and X **D** 3 and Y

23 The proportion of the local population who have malaria in area R is higher than the proportion in area S.

Which factor causes this difference?

A Area R has a more humid climate than area S.

B Area R is nearer the equator than area S.

C There is a higher population in area R than area S.

D There is less sewage treatment in area R than area S.

24 An earthquake caused damage to sanitation systems in a large tropical village.

Drinking water became contaminated with sewage. Heavy rain then caused flooding and left large pools of water in the village. Housing was destroyed and people in the village had to live in very overcrowded conditions.

Which infectious diseases could increase in the village population as a result of the earthquake and heavy rain?

1 cholera

2 malaria

3 tuberculosis

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

25 Which row is correct for each disease?

	cholera	HIV / AIDS	malaria	measles
A	caused by a bacterium	can be transmitted in breast milk and across placenta	eradication programme unsuccessful	caused by a virus
B	eating raw shellfish can be a source of infection	may be carried by a vector	carried by male *Anopheles* mosquitoes	can cause blindness
C	air borne infection	caused by a retrovirus	causative agent is a eukaryote	symptoms usu include a ras
D	can be caught by swimming in contaminated water	causes reduction in number of T-lymphocytes	mainly kills children under five years	no effective vaccination avai

26 Which row correctly identifies the causative organism of each disease?

	cholera	measles	smallpox	tuberculosis
A	*Variola*	*Morbillivirus*	*Vibrio*	*Mycobacterium*
B	*Variola*	*Mycobacterium*	*Vibrio*	*Morbillivirus*
C	*Vibrio*	*Morbillivirus*	*Variola*	*Mycobacterium*
D	*Vibrio*	*Mycobacterium*	*Variola*	*Morbillivirus*

27 The following advice was given to a person travelling to a country where there had been an outbreak of an infectious disease.

- cook food well and eat it hot
- peel fruit and vegetables
- drink only cool, boiled water
- wash hands often with soap and cool, boiled water

Which infectious disease would this advice help to protect against?

A cholera

B malaria

C measles

D tuberculosis

28 What is a **social** factor that affects the spread of malaria?

A an increase in drug resistant forms of malaria

B climate change

C difficulty in producing a vaccine

D migration of people because of wars

29 Outbreaks of cholera commonly occur in refugee camps that are set up after a major natural disaster such as earthquakes.

The list shows some measures that can be taken to limit the spread of cholera in the refugee camps.

1 treating all drinking water supplies with a high concentration of chlorine

2 setting up an emergency treatment centre to isolate cases of cholera and treat them with antibiotics

3 using concentrated disinfectant to clean sewage disposal areas and infected bedding

4 health workers visiting regularly to detect cases

5 keeping good records of the number of cases and deaths at treatment centres

Which features of these control measures involve an economic factor?

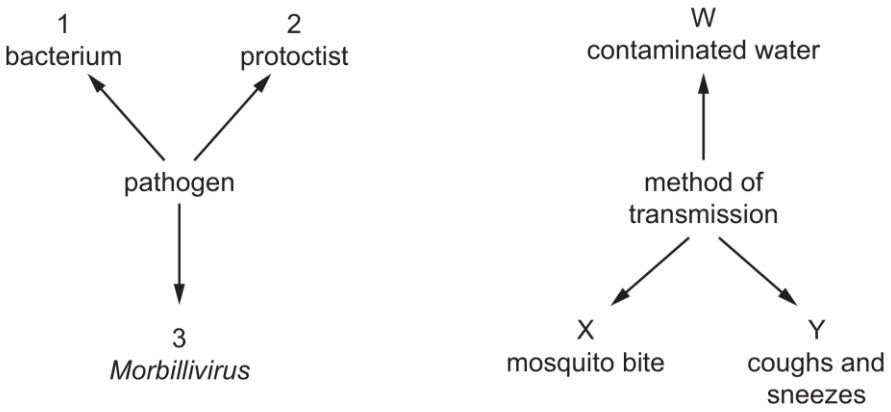
A 1, 2, 3, 4 and 5

B 1, 3 and 5 only

C 2, 3, 4 and 5 only

D 2 and 4 only

30 The diagram shows some of the pathogens that cause disease in humans and some of the ways they are transmitted.



What is the correct pathogen and method of transmission for cholera?

A 1 and W **B** 1 and X **C** 2 and X **D** 3 and Y

31 Which statements about a non-infectious disease may be correct?

1 It can result from a mutation.

2 It can be transmitted by an insect vector.

3 It can be transmitted from mother to child.

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

32 Which row identifies both the type of pathogen that causes cholera and the way in which cholera is transmitted from person to person?

	type of pathogen	method of transmission
A	bacteria	drinking water contaminated with the pathogen
B	bacteria	inhaling water droplets contaminated with the pathogen
C	virus	drinking water contaminated with the pathogen
D	virus	inhaling water droplets contaminated with the pathogen

33 Why do people with HIV/AIDS have a higher occurrence of malaria than people without HIV/AIDS?

A HIV/AIDS and malaria are both diseases where the pathogen travels in blood.

B HIV/AIDS and malaria are both transmitted in blood.

C HIV/AIDS infects T-lymphocytes which are used by the malaria pathogen.

D HIV/AIDS suppresses the immune response to the malaria pathogen.

34 Which list contains only infectious diseases?

A cholera, HIV / AIDS, lung cancer and malaria

B cholera, malaria, tuberculosis (TB) and sickle cell anaemia

C HIV / AIDS, malaria, measles and tuberculosis (TB)

D lung cancer, measles, sickle cell anaemia and tuberculosis (TB)

35 Why has it proved difficult to develop an effective vaccine against malaria?

A Mosquitoes have many stages in their life cycles.

B The human immune system does not recognise the antigens of the parasite.

C The parasites can only be attacked when outside the liver cells and red blood cells.

D Vaccines are rapidly broken down by proteases in the stomach.