

Q2.

Pathogens cause infectious diseases.

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

| Disease | Type of pathogen |
|------------|------------------|
| Gonorrhoea | Bacterium |
| | Fungus |
| Measles | Protist |
| | Virus |

(2)

The body defends itself against pathogens in different ways.

(b) Give **two** ways that the body prevents pathogens entering the body.

1. _____

2. _____

(2)

(c) If pathogens do enter the body the immune system tries to destroy the pathogens.

Describe how the immune system defends the body against disease.

(6)

(d) Give **one** reason why antibiotics cannot be used to treat HIV infections.

(1)

(e) Give **two** ways to prevent the spread of HIV.

1. _____

2. _____

(2)

(f) Some people with a HIV infection develop AIDS.

Some people with AIDS may die from a different type of infection, such as a chest infection.

Why do people with AIDS die from a different type of infection?

Tick (✓) **one** box.

HIV damages the immune system.

Pathogens enter the body more easily.

People with AIDS are immune to HIV.

(1)

(Total 14 marks)

Higher Questions

Q3.

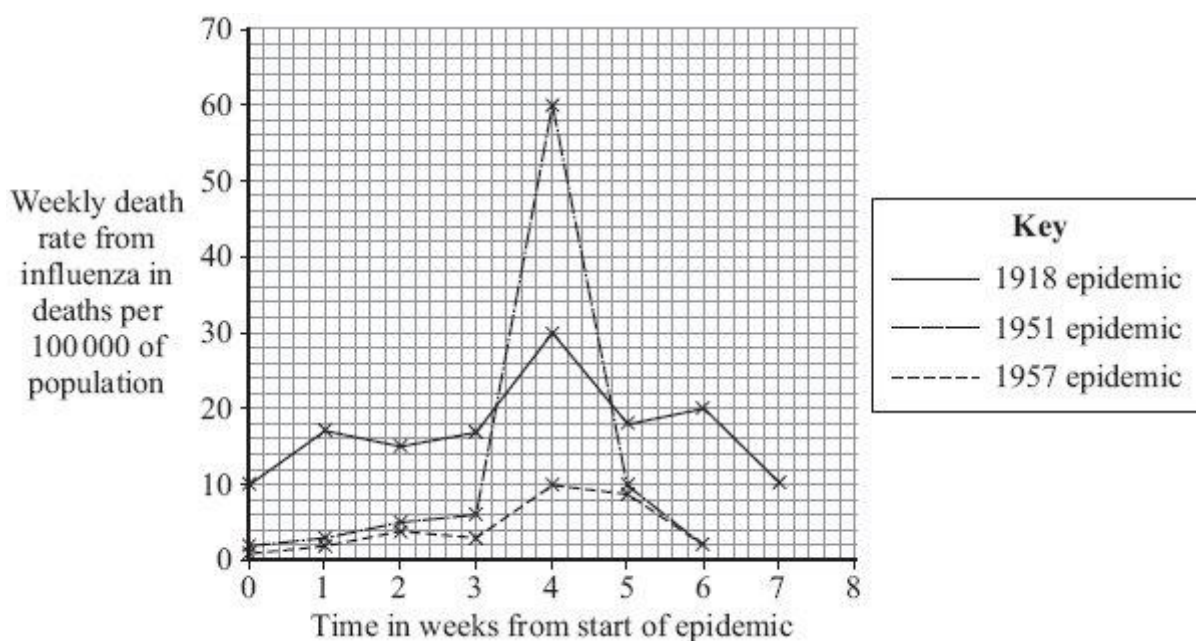
Influenza is a disease caused by a virus.

- (a) Explain why it is difficult to treat diseases caused by viruses.

(2)

- (b) In some years there are influenza epidemics.

The graph shows the death rate in Liverpool during three influenza epidemics.



- (i) The population of Liverpool in 1951 was approximately 700 000.

Calculate the approximate number of deaths from influenza in week 4 of the 1951 epidemic.

Show clearly how you work out your answer.

Number of deaths _____

(2)

(b) Name the type of drug that can be used to treat HIV.

(1)

(c) Describe how AIDS is different from HIV infection.

(1)

(Total 8 marks)

Mark schemes

Q1.

Level 2: Scientifically relevant facts, events or processes are identified and given in detail to form an accurate account.

4–6

Level 1: Facts, events or processes are identified and simply stated but their relevance is not clear.

1–3

No relevant content

0

Indicative content General

- (many / infectious) diseases are caused by pathogens / microorganisms / bacteria / viruses / microbes
- skin / airways / stomach prevent entry of pathogens

Skin

- skin is a (physical) barrier
- scabs form over cuts forming a barrier
- platelets are needed to form the scab
- skin produces antimicrobial secretions
- that kill pathogens / microorganisms / bacteria / viruses / microbes

Airways

- some pathogens / microorganisms / bacteria / viruses / microbes spread via air **or** are breathed in
- trachea / airways secrete mucus
- mucus traps pathogens / microorganisms / bacteria / viruses / microbes
- mucus moved by cilia
- mucus moved upwards
- mucus is swallowed

Stomach

- (mucus / pathogens) enter(s) stomach which contains acid
- stomach acid kills pathogens / microorganisms / bacteria / viruses / microbes in mucus
- stomach acid kills (most) pathogens / microorganisms / bacteria / viruses / microbes that are in food

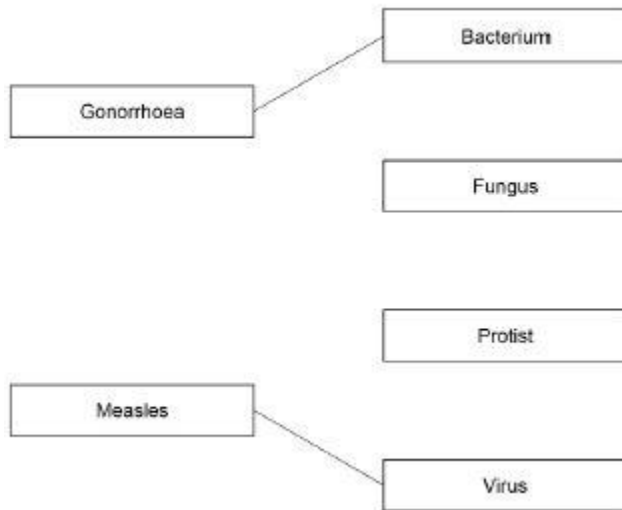
Responses referring to only skin **or** airways **or** stomach are **Level 1**.

[9]

Q2.

- (a) extra line(s) from a disease negates that mark

1



1

(b) any **two** from:

- skin (acts as a barrier)
ignore references to the immune response
- *mucus in trachea / bronchi
allow mucus in airways
- *mucus in nose
 - *allow mucus unqualified if **neither** idea given
- cilia (in trachea / bronchi / respiratory tract)
ignore references to hairs
- (hydrochloric) acid in stomach
allow scab forms (if you cut yourself)
allow tears

2

(c) **Level 2:** Scientifically relevant facts, events or processes are identified and given in detail to form an accurate account.

4-6

Level 1: Facts, events or processes are identified and simply stated but their relevance is not clear.

1-3

No relevant content

0

Indicative content

- white blood cells
- detect / identify foreign antigens / cells / pathogens / bacteria
- destroy / kill invading cells
- phagocytes
- engulf invading cells
- digest / kill invading cells

- produce antibodies
- (antibodies) attach to invading cells
- (antibodies) destroy / kill invading cells
- (antibodies) make invading cells clump together
- (so) phagocytes can engulf more cells / pathogens / bacteria
- produce antitoxins
- to destroy toxins
- (so) less tissue damage
- (therefore) don't feel as ill
- produce memory cells
- (so) immune response (to later exposure) is faster

A description of the ways that white blood cells act is needed for Level 2.

(d) any **one** from:

- HIV is a virus
*allow HIV is **not** a bacterium*
- antibiotics do **not** kill viruses
- antibiotics (are used to) kill bacteria

1

(e) any **two** from:

- avoid sexual intercourse
ignore handwashing
ignore social distancing
- use a condom
allow practise safe sex
ignore use protection unqualified
ignore use contraception unqualified
- do not share needles
- use antiretroviral drugs
ignore use medication unqualified
- screen blood used for transfusions
allow have regular checks / tests to see if you have HIV
if no other marks awarded allow 1 mark for do not exchange body fluids

2

(f) HIV damages the immune system

1

[14]

Higher Mark scheme

Q3.

(a) any **two** from

- live inside / infect body cells
- difficult for drugs to enter (body) cells / drug would kill (body) cell
- antibiotics ineffective against viruses
- viruses mutate **frequently**

2

(b) (i) 420

*correct answer with **or** without working*

*if answer incorrect evidence of 'number of deaths' × 7 **or** 60 seen gains 1 mark*

ignore 6 000 000

2

(ii) any **three** from:

- virus / flu mutates
- people no longer / not immune
ignore resistance
- white blood cells / memory cells / immune system do not recognise virus
- relevant reference to antibodies / antigens
- current vaccine ineffective **or** no vaccine available then **or** takes time to develop new vaccine
allow no tamiflu / anti-viral drugs
- conditions less hygienic / lack of hygiene
- people in poor health (following world wars)
allow people had 'weak' immune system

3

[7]

Q4.

(a) phagocytosis

*allow engulfing / ingestion of pathogens
do **not** accept eats pathogens*

1

producing antibodies

1

(which) attach to pathogen

or

(which) make pathogens clump together

*allow attaches to antigens on pathogen
allow (antibodies) cause agglutination
ignore kills pathogen unqualified*

1

- producing antitoxins 1
- (which) destroy toxins released by pathogen 1
- (some WBC are) memory cells which respond quickly on reinfection
or
(some WBC) recognise pathogens / antigen and respond quickly on reinfection 1
- (b) antiretroviral
- allow correctly named example of antiretroviral
used to treat HIV
for example, tenofovir / emtricitabine / lamivudine
/ efavirenz
ignore prep
ignore antiviral
do **not** accept antibiotics* 1
- (c) HIV is an infection by a virus, whereas AIDS is the consequences in the body
from HIV infection
- allow HIV is an infection by a virus whereas in
AIDS the immune system can no longer deal with
other infections / cancer* 1

[8]