

B6- Preventing and Treating Disease Exam Practice 1

Name:

Score:

Q1.

Chickenpox is a disease. Many children get chickenpox.

Most children recover quickly with no serious long term effects.

Chickenpox cannot be treated with antibiotics.

(a) What type of pathogen causes chickenpox?

(1)

People can pay for their child to be vaccinated against chickenpox.

The vaccination stimulates the production of antibodies.

(b) Which part of the blood produces antibodies?

Tick **one** box.

Plasma

Platelets

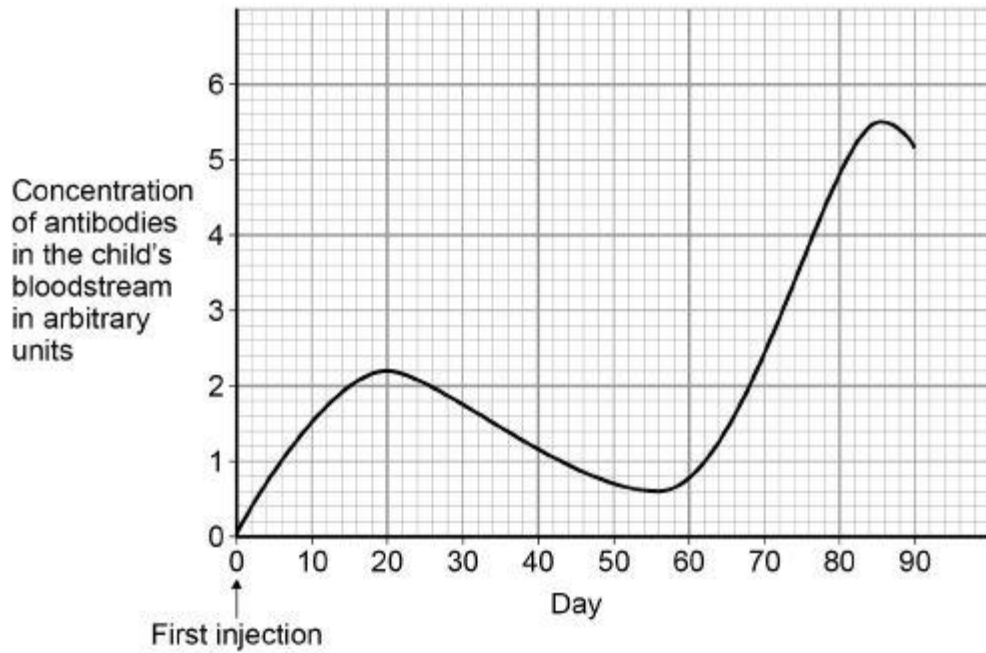
Red blood cells

White blood cells

(1)

The vaccination involves two injections.

The graph below shows how the concentration of antibodies in a child's bloodstream changes.



- (c) Suggest on what day the second injection was given.

Day = _____

(1)

- (d) On which day is the child's ability to defend against chickenpox at its peak?

Day = _____

(1)

Children can only have the chickenpox vaccination if their parents pay for the vaccine.

Some people think the vaccination should be free to all children.

- (e) If more people were vaccinated the number of children getting chickenpox would decrease.

What are **two** possible reasons for this decrease?

Tick **two** boxes.

Drugs to treat chickenpox are no longer effective

Children are less likely to come into contact with someone with the disease

More people will have the correct antibodies

People may catch the disease from the vaccination

People may have a weakened immune system

(2)

- (f) The government needs to decide whether to make the chickenpox vaccination free to all children.

Suggest **two** factors the government should consider when making this decision.

1. _____

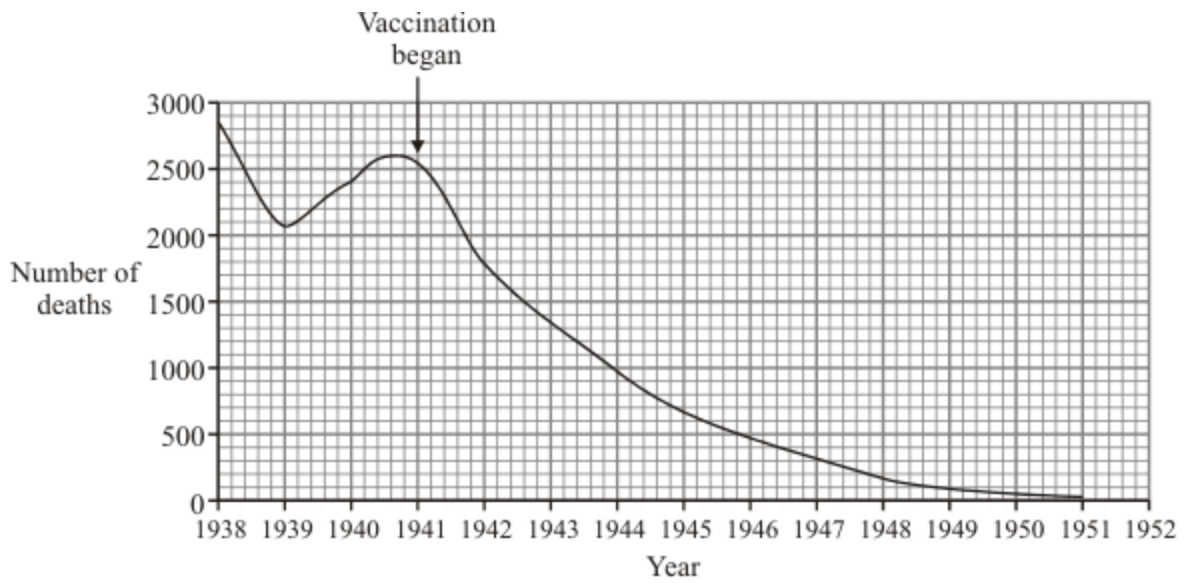
2. _____

(2)

(Total 8 marks)

Q2.

Diphtheria is a disease of the human breathing system. The graph shows the number of deaths from diphtheria in the United Kingdom between 1938 and 1951. Vaccination against diphtheria was begun in 1941.



- (a) What evidence in the graph suggests that vaccination protects people from diphtheria?

(1)

- (b) Complete the passage by choosing the correct words from the box.

antibodies	bacteria	platelets
red blood cells	white blood cells	

During vaccination, harmless _____ are injected into the body.

This causes _____ to make _____

which help to protect the body against diphtheria.

(3)

(Total 4 marks)

Q3.

Flu is an infectious disease caused by a virus.

Many people in England become infected with the flu virus in winter.

- (a) Doctors do not prescribe antibiotics to patients with flu. Doctors do not prescribe antibiotics to patients with flu.

State why.

(1)

- (b) A flu vaccine is offered to people with a high risk of having a severe illness if they are infected by the flu virus.

What does a flu vaccine contain?

Tick (✓) **one** box.

Inactive antibodies	<input type="checkbox"/>
Inactive viruses	<input type="checkbox"/>
White blood cells	<input type="checkbox"/>

(1)

- (c) The table shows the percentage of people in high-risk groups who had been vaccinated against flu by November in 2013. The data is for England.

Group at risk of a severe illness	Percentage (%) of group vaccinated by November in 2013
2-year-old children	31.1
3-year-old children	27.9
People 65 years and older	64.4

Give **one** conclusion from the data in the table above.

Suggest a reason for this.

Conclusion: _____

Reason: _____

(2)
(Total 4 marks)

Q4.

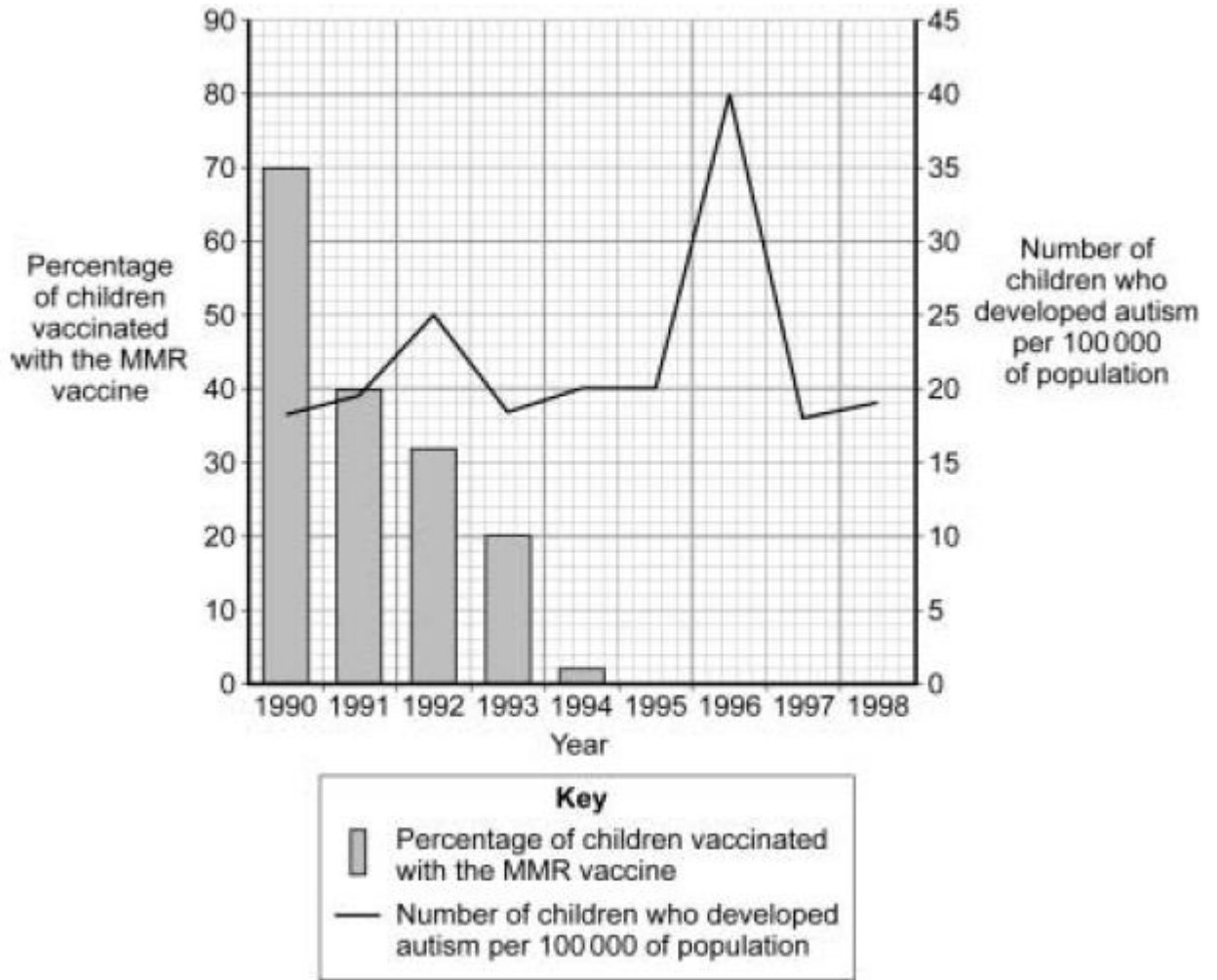
Many diseases are caused by viruses. Children are given vaccines to protect them against viral disease.

- (a) Explain how vaccination protects a child against a viral disease.

(3)

- (b) In the 1990s many people thought that the MMR vaccine caused autism in some children. This is why the Japanese government stopped using the MMR vaccine.

The graph gives information about the percentage of Japanese children who developed autism during the 1990s.



The data in the graph support the view that there is **no** link between MMR vaccination and autism.

Explain why.

(4)
(Total 7 marks)

Combined Higher Questions

Q5) White blood cells protect the body against pathogens such as bacteria and viruses.

- (a) (i) Pathogens make us feel ill.

Give **one** reason why.

(1)

- (ii) White blood cells produce antibodies. This is one way white blood cells protect us against pathogens.

Give **two** other ways that white blood cells protect us against pathogens.

1. _____

2. _____

(2)

- (b) Vaccination can protect us from the diseases pathogens cause.

- (i) One type of virus causes measles.

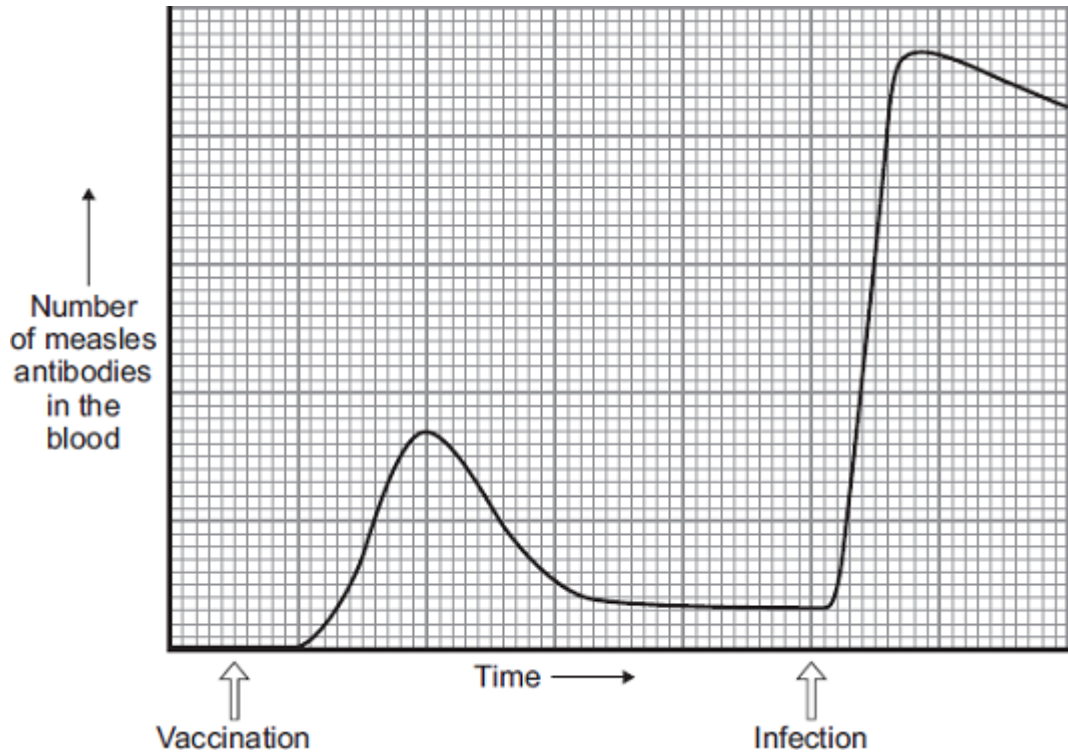
A doctor vaccinates a child against measles.

What does the doctor inject into the child to make the child immune to measles?

(2)

- (ii) A few weeks after the vaccination, the child becomes infected with measles viruses from another person.

The graph shows the number of measles antibodies in the child's blood from before the vaccination until after the infection.



More measles antibodies are produced after the infection than after the vaccination.

Describe other differences in antibody production after infection compared with after vaccination.

(3)

(iii) Vaccination against the measles virus will **not** protect the child against the rubella virus.

Why?

(1)

(c) What is the advantage of vaccinating a large proportion of the population against measles?

(1)

(Total 10 marks)

Q6.

The MMR vaccine is used to protect children against measles, mumps and rubella.

- (a) Explain, as fully as you can, how the MMR vaccine protects children from these diseases.

(3)

- (b) Read the passage.

Autism is a brain disorder that can result in behavioural problems. In 1998, Dr Andrew Wakefield published a report in a medical journal. Dr Wakefield and his colleagues had carried out tests on 12 autistic children.

Dr Wakefield and his colleagues claimed to have found a possible link between the MMR vaccine and autism.

Dr Wakefield wrote that the parents of eight of the twelve children blamed the MMR vaccine for autism. He said that symptoms of autism had started within days of vaccination.

Some newspapers used parts of the report in scare stories about the MMR vaccine. As a result, many parents refused to have their children vaccinated.

Dr Wakefield's research was being funded through solicitors for the twelve children. The lawyers wanted evidence to use against vaccine manufacturers.

Use information from the passage above to answer these questions.

- (i) Was Dr Wakefield's report based on reliable scientific evidence?

Explain the reasons for your answer.

(2)

(ii) Might Dr Wakefield's report have been biased?

Give the reason for your answer.

(1)

(Total 6 marks)

Mark schemes

Q1.

- (a) virus
- allow viral*
ignore communicable / airborne / microorganism / microbe
*do **not** accept bacteria / bacterial / fungus / fungal / protist*
- 1
- (b) white blood cells
- 1
- (c) 57
- allow any answer in range 55–59*
- 1
- (d) 85
- allow any answer in range 84–86*
- 1
- (e) children are less likely to come into contact with someone with the disease
- 1
- more people will have the correct antibodies
- 1
- (f) any **two** from:
- cost (to the NHS / government)
 - money saved through not treating people with chickenpox
 - how effective the vaccine is
 - severity of the disease
 - less effect of disease on people with weaker immune systems / elderly / HIV or on unborn babies
- 2

[8]

Q2.

- (a) decrease in number of deaths (after vaccination started)
- 1
- (b) in correct sequence:
- bacteria
- 1
- white blood cells
- 1
- antibodies
- 1

[4]

Q3.

- (a) antibiotics do not kill viruses
allow antibiotics only kill bacteria
allow flu is not caused by a bacterium
- or**
antibiotics are not effective against viruses
allow antibiotics cannot reach viruses inside cells 1
- (b) Inactive viruses 1
- (c) Conclusion:
people 65 years and older had the highest percentage vaccinated.
ignore references to figures unless qualified 1
- Reason:
more worried about becoming ill
or
had more time to go to the doctor.
OR
Conclusion:
children aged 3-years had the lowest percentage vaccinated.
- Reason:
parents didn't have time to take them to the doctor
or
they had been vaccinated when 2-years old. 1

[4]

Q4.

- (a) dead / inactive form of virus introduced into body 1
- white blood cells stimulated to produce antibodies 1
- correct antibodies rapidly made if the body is infected with the virus 1
- (b) the percentage of children vaccinated fell to zero in 1995 1
- but the number of children developing autism rose and fell during the period when % vaccinations was falling 1
- number of children developing autism peaked after MMR vaccination had ceased 1
- which suggests that something other than MMR vaccination was causing autism 1

Combined Higher Questions

Q5.

- (a) (i) any **one** from:
- (produce) toxins / poisons
 - (cause) damage to cells
kill / destroy cells
allow kills white blood cells
- 1
- (ii) produce antitoxins
- 1
- engulf / ingest / digest pathogens / viruses / bacteria / microorganisms
accept phagocytosis or description
ignore eat / consume / absorb for engulf
ignore references to memory cells
- 1
- (b) (i) dead / inactive / weakened
accept idea of antigen / protein
- 1
- (measles) pathogen / virus
ignore bacteria
- 1
- (ii) (after infection)
accept converse if clearly referring to before vaccination
- 1
- rise begins sooner / less lag time
- steeper / faster rise (in number)
- 1
- longer lasting **or** doesn't drop so quickly
idea of staying high for longer
ignore reference to higher starting point
- 1
- (iii) antibodies are specific or needs different antibodies
*accept antigens are different **or** white blood cells do not recognise virus*
- 1
- (c) reduces spread of infection / less likely to get an epidemic
accept idea of eradicating measles
- 1

Q6.

(a) any **three** from:

- vaccine is inactive / dead form of (pathogen)
allow antigens
- stimulates antibody production
- stimulates antitoxin production
- by white cells
- antibodies kill (pathogen)
- antitoxins neutralise poisons
- antibodies quickly produced on reinfection
ignore antibodies remain in blood
- reference to ingestion by white cells

3

(b) (i) (no)

any **two** from

- sample size small / only 12
- conclusion based on hearsay from parents
- only 8 parents linked autism to MMR
- no control used

2

(ii) (yes)
being paid by parents / lawyers

1

[6]