

Vaccines and Drugs

Q:1(a) Use words from the box to complete the sentences about curing disease.

antibiotics	antibodies	antitoxins	painkillers	statins
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The substances made by white blood cells to kill pathogens are called _____

The substances made by white blood cells to counteract poisons produced by pathogens are called _____

Medicines which kill bacteria are called _____

(3 marks)

(b) The MMR vaccine protects people against three diseases. Write down the names of two of these diseases.

1 _____

2 _____

(2 marks)

(c) All vaccinations involve some risk.

The table shows the risk of developing harmful effects:

⌘from the disease if a child is not given the MMR vaccine; ⌘if a child is given the MMR vaccine.

Harmful effect	Risk of getting the harmful effect from the disease (if not vaccinated)	Risk of getting the harmful effect from MMR vaccine
Convulsions	1 in 200	1 in 1000
Meningitis	1 in 3000	Less than 1 in 1 000 000
Brain damage	1 in 8000	0

A mother is considering if she should have her child vaccinated with the MMR vaccine.

Use information from the table to persuade the mother that she should have her child vaccinated.

(2 marks)

(d) The vaccine used to protect us from the Hepatitis B virus is produced by genetic engineering.

Yeast cells are used to produce the vaccine.

Use words from the box to complete the sentence.

chromosomes drugs enzymes genes hormones
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To produce the vaccine _____ are used to cut out _____
from the Hepatitis B virus which are then inserted into the yeast cells.

(2 marks)

Q:2 Controlling infections in hospitals has become much more difficult in recent years.

(a) Explain why MRSA is causing problems in many hospitals.

(2 marks)

(b) The pioneer in methods of treating infections in hospitals was Ignaz Semmelweiss. He observed that women whose babies were delivered by doctors in hospital had a death rate of 18% from infections caught in the hospital. Women whose babies were delivered by midwives in the hospital had a death rate of 2%. He observed that doctors often came straight from examining dead bodies to the delivery ward.

(i) In a controlled experiment, Semmelweiss made doctors wash their hands in chloride of lime solution before delivering the babies. The death rate fell to about 2% – down to the same level as the death rate in mothers whose babies were delivered by midwives.

Explain why the death rate fell.

(1 mark)

(ii) Explain how Semmelweiss's results could be used to reduce the spread of MRSA in a modern hospital.

(2 marks)

Q:3 Polio is a disease caused by a virus. In the UK, children are given polio vaccine to protect them against the disease.

(a) In the sentences below, draw a ring around the correct words in each box.

(i) It is difficult to kill the polio virus inside the body

because the virus

is not affected by drugs

lives inside cells.

produces antitoxins

(1 mark)

(ii) The vaccine contains an

- active
- infective
- inactive

form of the polio virus.

(1 mark)

(iii) The vaccine stimulates the white blood cells to

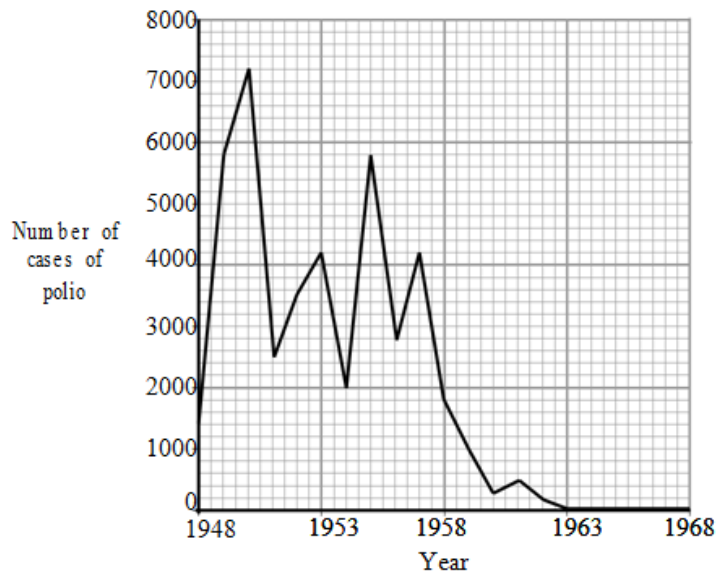
produce

- antibiotics
- antibodies
- drugs

which destroy the virus.

(1 mark)

(b) The graph shows the number of cases of polio in the UK between 1948 and 1968.



(i) In which year was the number of cases of polio highest?

(1 mark)

(ii) Polio vaccination was first used in the UK in 1955.

How many years did it take for the number of cases of polio to fall to zero?

(1 mark)

(iii) There have been no cases of polio in the UK for many years. But children are still vaccinated against the disease.

Suggest one reason for this.

(1 mark)

Q:4 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 marks)

(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 on the opposite page to answer these questions.

(i) Was Dr Wakefield's report based on reliable scientific evidence? Explain the reasons for your answer.

(2 marks)

(ii) Might Dr Wakefield's report have been biased? Give the reason for your answer.

(1 mark)

Q:5 The MMR vaccine is used to protect children against measles, mumps and rubella.

(a) Complete the sentences about vaccination. _____

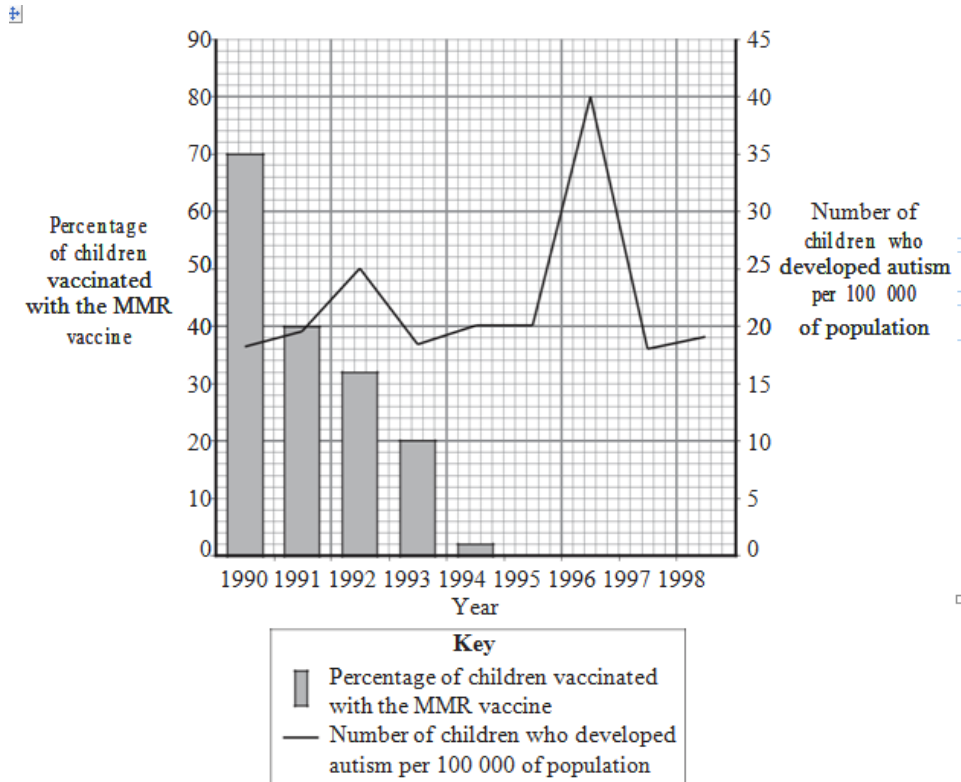
Vaccines stimulate white blood cells to produce

This makes children _____ to the pathogen.

(2 marks)

(b) In the 1990s, many people thought that the MMR vaccine caused autism in some children. As a result, the Japanese government stopped using the MMR vaccine.

The graph gives information about the percentage of children in Japan vaccinated with the MMR vaccine and the number of children who developed autism during the 1990s.



(b)(i) Describe how the percentage of children vaccinated with the MMR vaccine changed between 1990 and 1995.

(2 marks)

(b)(ii) Does the data in the graph support a link between MMR vaccination and autism?

Draw a ring around your answer. Yes / No

Explain the reason for your answer.

(2 marks)

Q:6 Vaccines protect us against diseases.

(a) Against which three diseases does the MMR vaccine protect us? Tick () three boxes.

- Malaria
- Measles
- Meningitis
- Mumps
- Rabies
- Rubella

(3 marks)

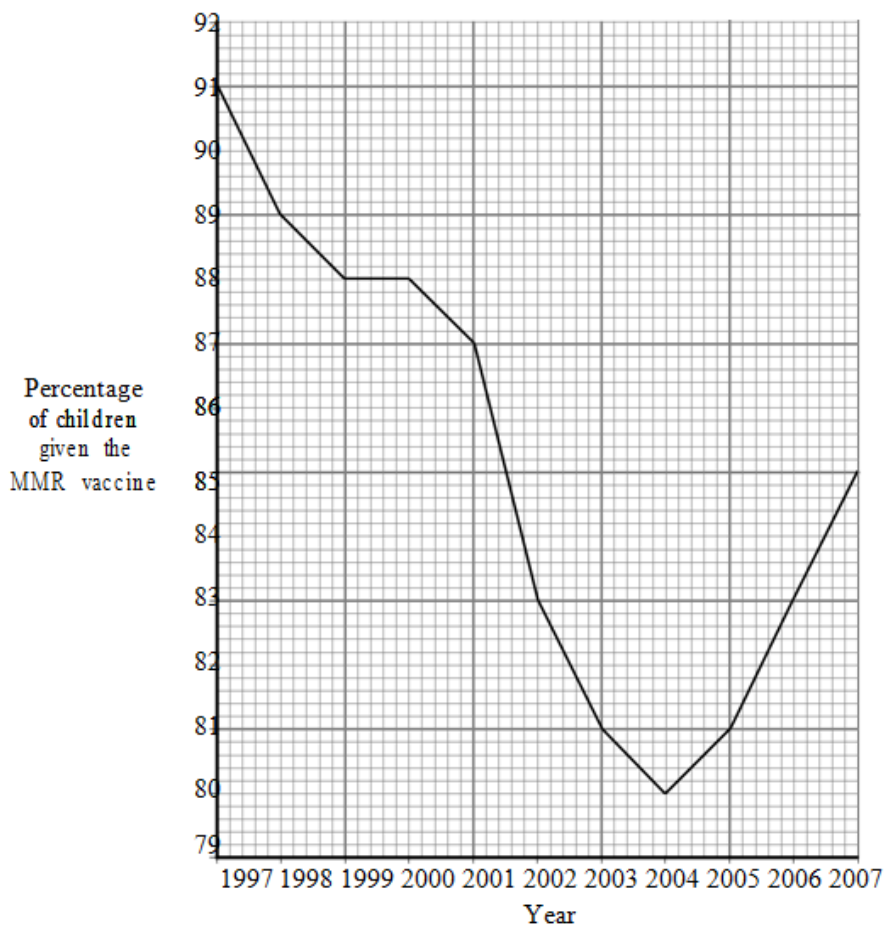
(b) Draw a ring around the correct word to complete the sentence.

Vaccines cause white blood cells to produce

- antibodies.
- cholesterol.
- penicillin.

(1 mark)

The graph shows the percentage of children given the MMR vaccine in the UK between 1997 and 2007.



(c)(i) Describe the pattern shown by the data on the graph.

(2 marks)

(c)(ii) Suggest one explanation for the change in the percentage of children given the MMR vaccine between 1997 and 2004.

(1 mark)

Q:7 Medicinal drugs are used to treat diseases.

(a) Draw one line from each drug to its correct use.

Drug	Use
<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">Painkiller</div>	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">Used as a fertility drug</div>
<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">Statin</div>	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">Used to relieve disease symptoms</div>
<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">Thalidomide</div>	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">Used to treat leprosy</div>
	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">Used to lower blood cholesterol</div>





(3 mark)

Q:8 Drugs affect our bodies.

(a)List A gives the names of four different substances.

List B gives information about different substances.

Draw one line from each substance in List A to the correct information about the substance in List B.

List A Substance	List B Information
<p data-bbox="367 575 441 600">Alcohol</p> 	<p data-bbox="732 575 954 630">Used to treat bacterial diseases</p>
<p data-bbox="354 764 477 789">Antibiotic</p> 	<p data-bbox="732 768 943 793">A very addictive drug</p>
<p data-bbox="367 1008 441 1033">Heroin</p> 	<p data-bbox="732 974 971 999">May cause lung cancer</p>
<p data-bbox="324 1230 487 1255">Cigarette smoke</p> 	<p data-bbox="732 1360 971 1386">May cause babies to be born with abnormal limbs</p>
	<p data-bbox="732 1360 971 1386">May cause liver disease</p>

(4 mark)

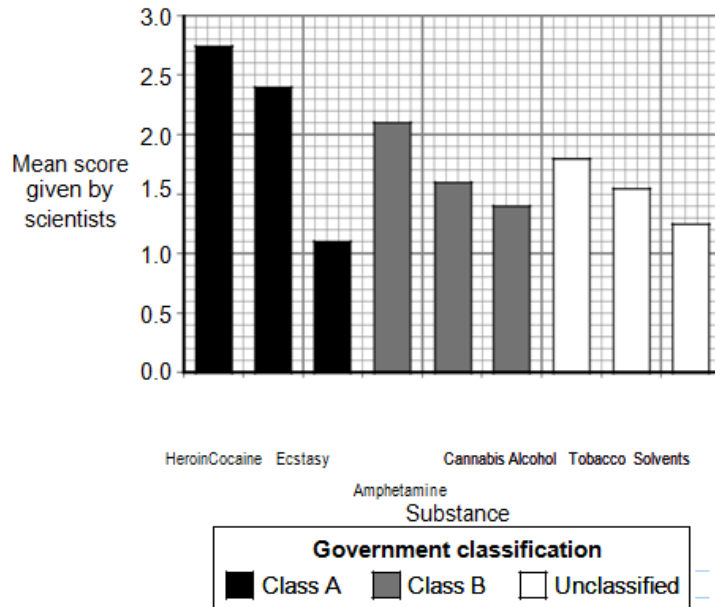
(b) A group of scientists was asked to say how much harm recreational drugs cause.

The scientists used a scale of 1– 3, with 3 being the most harmful.

Their results are shown on the graph.

The government classifies drugs into three groups.

The groups are shown in the key below the graph.



(b) (i) Name the drug which scientists think is least harmful.

(1 mark)

(b) (ii) In the government classification, class A drugs are the most harmful and unclassified drugs are the least harmful.

Does the government classification agree with the scientists' classification for all the drugs?

Draw a ring around your answer. Yes / No

Give one piece of evidence from the graph to support your answer.

(1 mark)

(c) Draw a ring around the correct answer to complete the sentence.

People use recreational drugs

to cure disease.
to prevent diseases.
for pleasure.

(1 mark)

TOTAL MARKS=49