Q1. Microorganisms can cause disease.

(a) Draw **one** line from each disease to the correct description.

HIV	Can be spread by not washing hands thoroughly.
	Can increase the chance of infection such as pneumonia.
Malaria	Part of the life cycle include an insect.
	spread by cough and sneezes.
Salmonella	Treated with stem cell.
	Treated with fungicides.

(3)

(b) Gonorrhoea is a sexually transmitted disease.

A bacterium causes gonorrhoea.

What are the symptoms of gonorrhoea?

Tick **two** boxes.

- Headache ☐
- Pain when urinating ☐
- Rash ☐
- Vomiting ☐

Yellow discharge ☐

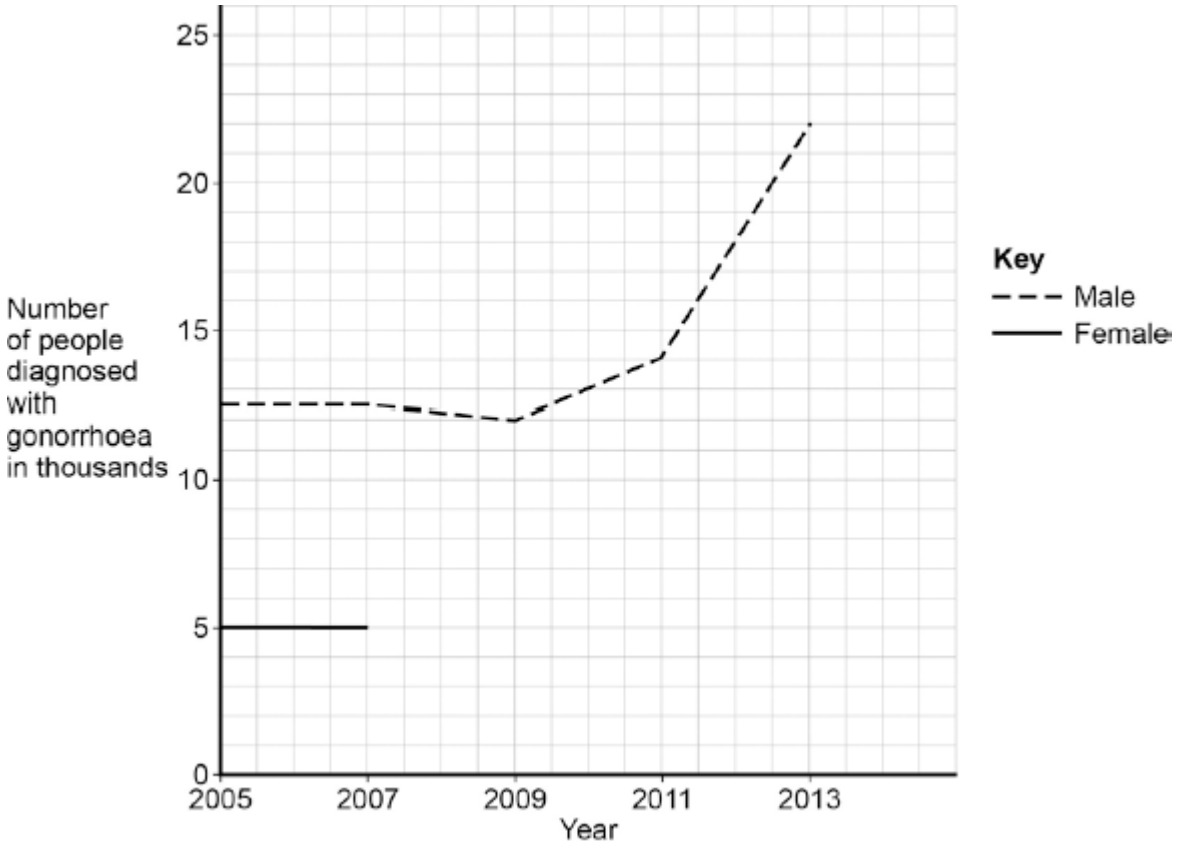
(2)

(c) The table below shows the number of people in the UK diagnosed with gonorrhoea in different years.

	Number of people diagnosed with gonorrhoea in thousands	
Year	**Female**	**Male**
2005	5.0	12.5
2007	5.0	12.5
2009	5.5	12.0
2011	6.0	14.0
2013	7.5	22.0

Use the data in the table to complete the graph below.

- The numbers for males have already been plotted.
- Only some of the numbers for females have been plotted.



(3)

(d) Describe the patterns in the numbers of males and females with gonorrhoea from 2005 to 2013.

Use the data in the graph.

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(3)

(e) Gonorrhoea is treated with an antibiotic.

HIV is another sexually transmitted disease.

Explain why prescribing an antibiotic will **not** cure HIV.

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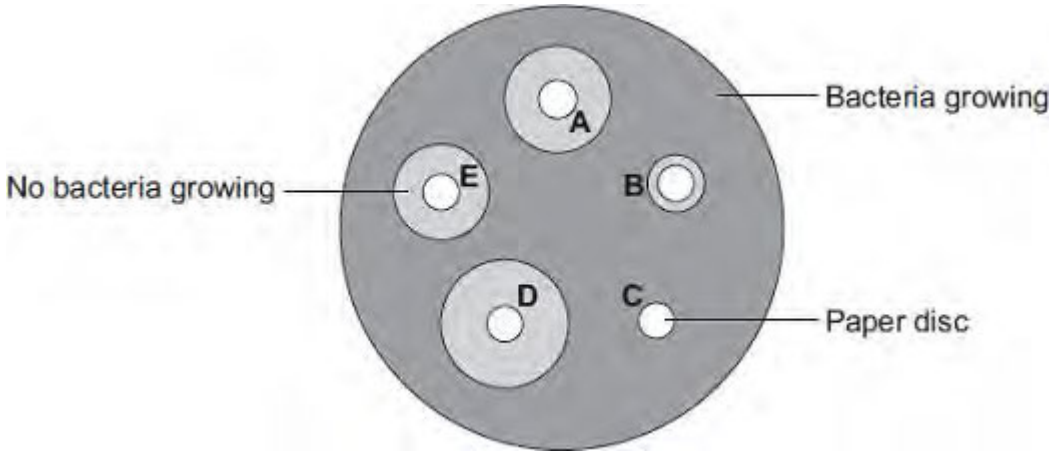
(2)
(Total 13 marks)

Q2. Students in a school investigated the effect of five different antibiotics, **A**, **B**, **C**, **D** and **E**, on one type of bacterium.

The students:

- grew the bacteria on agar jelly in a Petri dish
- soaked separate paper discs in each of the antibiotics
- put the paper discs onto the bacteria in the Petri dish
- put the Petri dish into an incubator.

The diagram shows what the Petri dish looked like after 3 days.



(a) (i) What is the maximum temperature the incubator should be set at in the school?

Draw a ring around your answer.

10°C 25°C 50°C

(1)

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

The incubator should **not** be set at a higher temperature because the higher temperature might help the growth of

pathogens.
toxins.
viruses.

(1)

(b) Which antibiotic, **A**, **B**, **C**, **D** or **E**, would be best to treat a disease caused by this type of bacterium?

Write your answer in the box. ☐

Give the reason for your answer.

.....

.....

(2)

(c) Antibiotics **cannot** be used to treat diseases caused by viruses.

Why?

Tick (✓) **one** box.

Viruses are not pathogens ☐

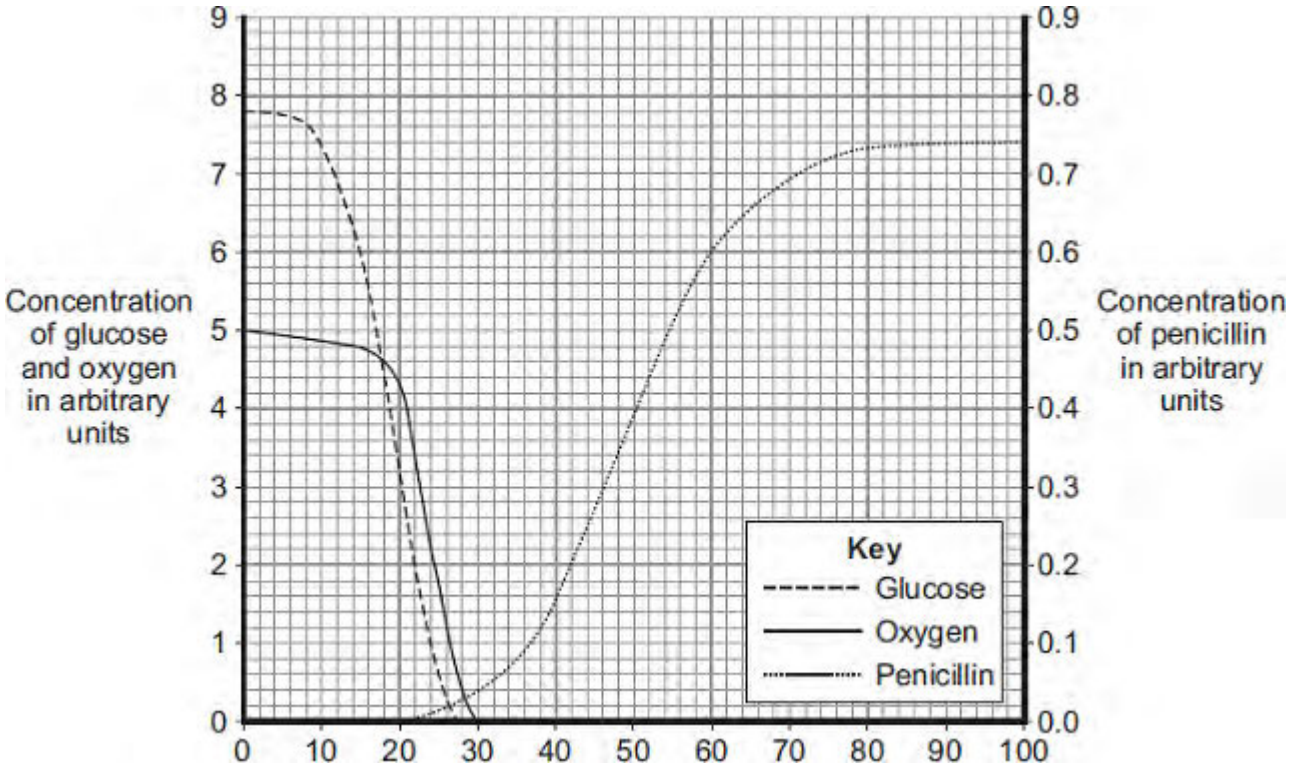
There are too many different types of virus ☐

Viruses live inside cells ☐

(1)
(Total 5 marks)

Q3. The mould *Penicillium* can be grown in a fermenter. *Penicillium* produces the antibiotic penicillin.

The graph shows changes that occurred in a fermenter during the production of penicillin.



(a) During which time period was penicillin produced most quickly?

Draw a ring around **one** answer.

0 – 20 hours **40 – 60 hours** **80 – 100 hours**

(1)

(b) (i) Describe how the concentration of glucose in the fermenter changes between 0 and 30 hours.

.....

.....

.....

.....

(2)

(ii) How does the change in the concentration of oxygen in the fermenter compare with the change in concentration of glucose between 0 and 30 hours?

Tick (✓) **two** boxes.

The oxygen concentration changes after the glucose concentration. ☐

The oxygen concentration changes before the glucose concentration. ☐

The oxygen concentration changes less than the glucose concentration. ☐

The oxygen concentration changes more than the glucose concentration. ☐

(2)

(iii) What is the name of the process that uses glucose?

Draw a ring around **one** answer.

distillation **filtration** **respiration**

(1)
(Total 6 marks)

Q4. (a) Use words from the box to complete the sentences about curing disease.

antibiotics	antibodies	antitoxins	painkillers	statins

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)

(b) The MMR vaccine protects people against three diseases.

Write down the names of **two** of these diseases.

1 .....

2 .....

(2)

(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 developing the harmful effect from the disease if not given the MMR vaccine	Risk of developing the harmful effect if given the 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.

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(2)
(Total 7 marks)

Q5. Viruses and bacteria cause diseases in humans.

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

Organisms that cause disease are called	algae.
	pathogens.
	vaccines.

(1)

(b) In August 2011 the United Nations gave a warning that there was a new strain of the bird flu virus in China.

Bird flu may kill humans. The new strain of the bird flu virus could cause a *pandemic* very quickly.

(i) What is a *pandemic*?

Tick (✓) **one** box.

A disease affecting the people all over one country. ☐

A disease affecting hundreds of people. ☐

A disease affecting people in many countries. ☐

(1)

(ii) The swine flu virus is carried by pigs.

The bird flu virus is likely to spread much more quickly than the swine flu virus.

Suggest **one** reason why.

.....

.....

(1)

This notice is from a doctor's surgery.

**Unfortunately,
antibiotics
will NOT get
rid of your flu.**

(c) (i) Why will antibiotics **not** get rid of flu?

.....

.....

(1)

(ii) The symptoms of flu include a sore throat and aching muscles.

What would a doctor give to a patient to relieve the symptoms of flu?

.....

(1)

(iii) It is important that antibiotics are **not** overused.

Explain why.

Use words from the box to complete the sentence.

antibody	**bacteria**	**immune**	**resistant**	**viruses**

Overuse of antibiotics might speed up the development

of ..... strains of ..... .

(2)

(Total 7 marks)

Q6. Many people in the UK take sleeping pills.

(a) The drug thalidomide was developed as a sleeping pill in the 1950s. In the 1960s thalidomide was banned. Recently thalidomide has been used to treat other diseases.

Name **one** disease thalidomide is used to treat now.

.....

(1)

(b) The table shows information about the development of a new sleeping pill.

Type of test or trial	Preclinical	Clinical phase 1	Clinical phase 2	Clinical phase 3
Tested or trialled on	Cells, tissues or animals	20 −100 healthy volunteers	100 − 500 volunteer patients	1000 − 5000 volunteer patients
Number of compounds tested	>10 000	5 −10	2 − 3	1 (new sleeping pill)
Time taken for test or trial in years	1− 4	2− 4	1 − 3	2 − 4

(i) What is the shortest time taken to develop a new sleeping pill?

..... years

(1)

(ii) What is the **range** for the number of volunteers needed to complete all the clinical trials for the new sleeping pill?

.....

(1)

(c) Drugs are trialled to check for side effects on people.

Give **one** other reason why drugs are trialled.

.....

.....

(1)

(d) The pie chart shows the impact on the health of the population caused by drugs from different sources.

(i) Legal non-prescribed drugs have a greater impact on the health of the population than illegal drugs.

Suggest **two** reasons why.

.....

.....

.....

.....

.....

.....

(2)

(ii) Drugs change chemical processes in a person's body.

Why is it difficult for a person to stop taking certain drugs?

.....

.....

(1)

(Total 7 marks)

Q7. Drugs affect the human body.

(a) Draw **one** line from each drug to the correct information about the drug.

Drug	Information
Cannabis	Used to boost heart rate
Steroid	Used to treat leprosy
Stimulant	May cause mental illness in some people
Thalidomide	Used to increase muscle growth
	Used to treat measles

(4)

(b) New drugs must be tested and trialled before being used.

(i) New drugs are tested in a laboratory before they are trialled on people.

What are new drugs tested on in a laboratory?

.....

(1)

(ii) Why is it important that drugs are trialled before doctors give them to patients?

Tick (✓) **two** boxes.

To check that the drug works ☐

To check the cost of the drug ☐

To find out if the drug is legal ☐

To find the best dose to use ☐

(2)

(iii) In a double blind drug trial, only some people know which patients have been given the drug.

Who knows which patients have been given the drug?

Tick (✓) **one** box.

The patient and the doctor ☐

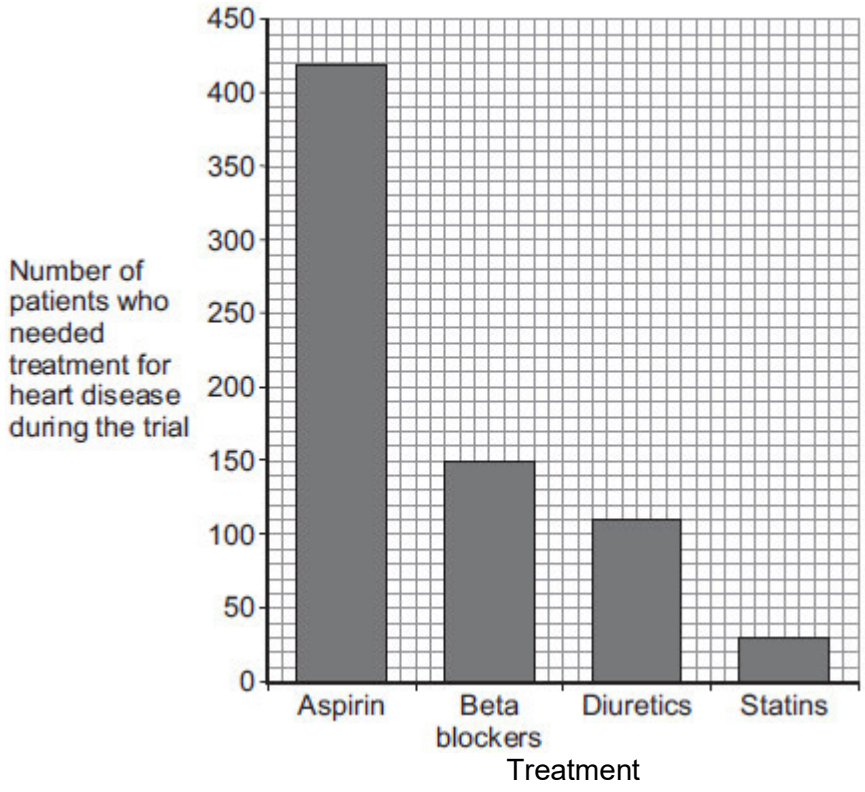
Only the doctor ☐

Only scientists at the drug company ☐

(1)

(c) Doctors trialled four different treatments for reducing the risk of heart disease.
Each treatment was trialled on the same number of patients for 5 years.
The patients did **not** have heart disease at the start of the trial.

The graph below shows the results.



(i) How many patients who took aspirin needed treatment for heart disease during the trial?

Number of patients = ...

(1)

(ii) Based **only** on the evidence in the graph, which would be the best treatment to reduce the risk of developing heart disease?

.....

(1)

(iii) Suggest **one** other factor that a doctor might consider before deciding which treatment to use for a patient.

.....

(1)

(Total 11 marks)