Oxford Cambridge and RSA

GCSE Biology A (Gateway)

J247/02 B4-B6 and B7 Foundation (Foundation Tier)

Question Set 4

1 Different parts of the body have natural defence mechanisms to stop pathogens infecting the body.

These defences include:

- skin
- tears
- secretions from the stomach.

(a) Describe how each defence stops pathogens infecting the body.

[4]

(b) Sometimes the defence mechanisms do **not** work and pathogens enter the body. The pathogens may then be treated with antibiotics.

What is an antibiotic?

[2]

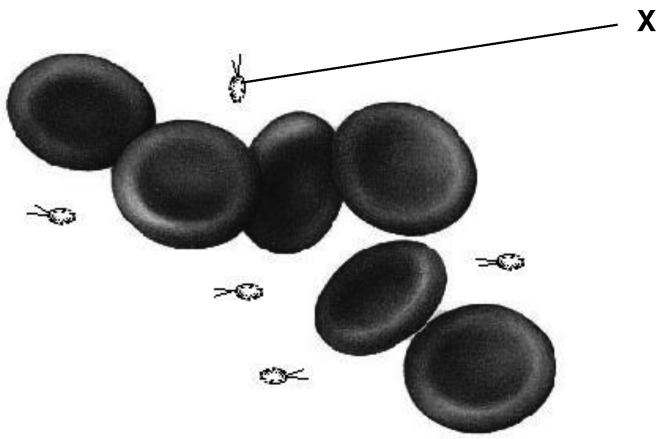
(c) A student is ill and is having tests in hospital.
His doctors monitor his body temperature frequently.

Explain why it is important to monitor his body temperature frequently.

[2]

(d) The doctors took a sample of blood from the student. They looked at the specimen under a light microscope.

This is a picture of what they saw.



From this picture, the doctors decide that the student's illness is caused by bacteria (labelled **X**).

(i) Why do the doctors **not** think that the structures labelled **X** are viruses?

[1]

(ii) What equipment could the doctors use to get a clearer image to confirm their ideas?

[1]

(e) **(i)** The student's doctors want to check that the bacteria causing his illness are not resistant to the antibiotic erythromycin.

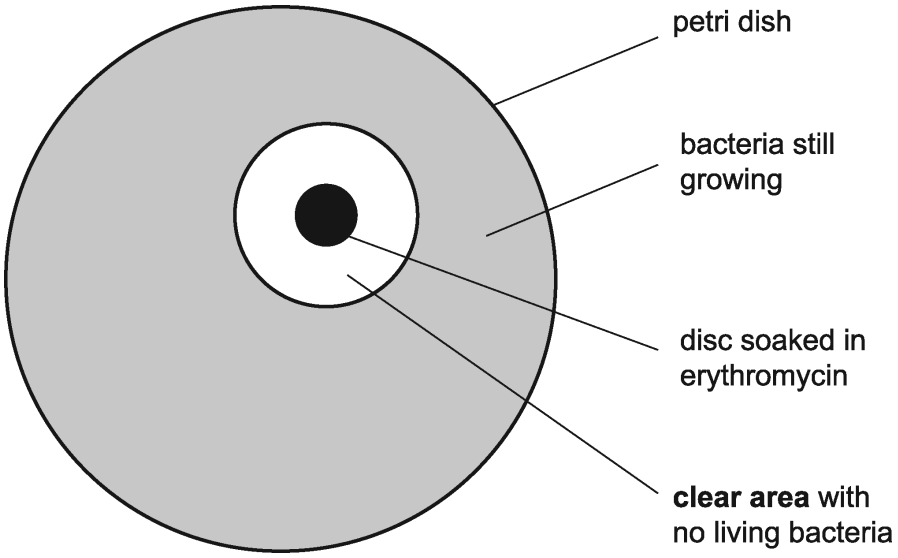
This is the method they use:

1. A petri dish is made that has the bacteria growing evenly over the surface of agar.
2. A disc of filter paper is soaked in erythromycin.
3. The disc is placed on the agar in the centre of the petri dish.
4. The lid of the dish is fixed on with a piece of tape.
5. The dish is then incubated.

Why did the doctors tape the lid on the petri dish?

[1]

(ii) The diagram shows the doctor's results.



Use a ruler to measure the diameter of the **clear area** in mm.

Using this diameter, calculate the area of the circle where there are no living bacteria.

- The area of a circle = πr^2 and $\pi = 3.14$

Answer = ... mm^2 **[3]**

(iii) This table is used to analyse the results of the experiment.

Area clear of bacteria including the area of the disc (mm^2)	**Level of resistance**
less than 133	resistant
133 to 416	intermediate resistance
more than 416	not resistant

Use your result from part **(ii)** to judge the level of resistance in the microbe. **[1]**

Total Marks for Question Set 4: 15