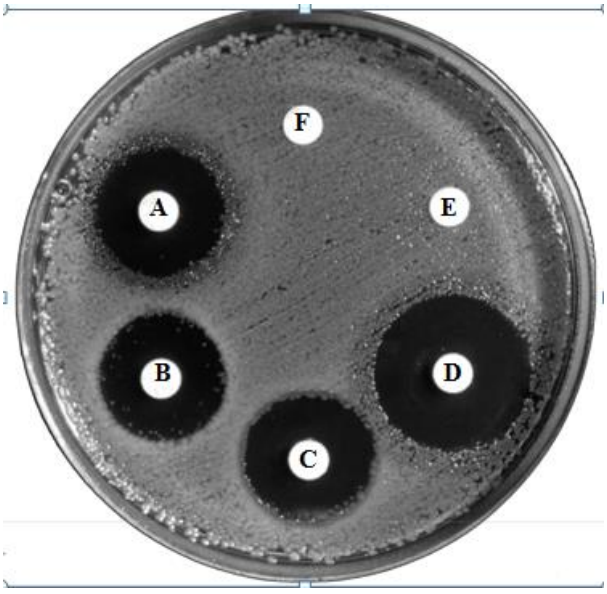
Antibiotic Resistant Bacteria

Q:1 Some scientists tested the effectiveness of six new antibiotics, A, B, C, D, E and F.

- They mixed a culture of one species of bacterium with nutrient agar in a Petri dish.
- They then prepared separate discs of filter paper, each soaked in a different antibiotic.
- They placed the filter paper discs on the surface of the agar.
- The Petri dish was kept at 35 ºC for 2 days.

The results are shown in the photograph.



(a) (i) Which two antibiotics from A, B, C, D, E and F, did not kill this species of bacterium?

☐ ☐

(1 mark)

(a)(ii) Which would be the best antibiotic, A, B, C, D, E or F, to treat an infection caused by this species of bacterium?

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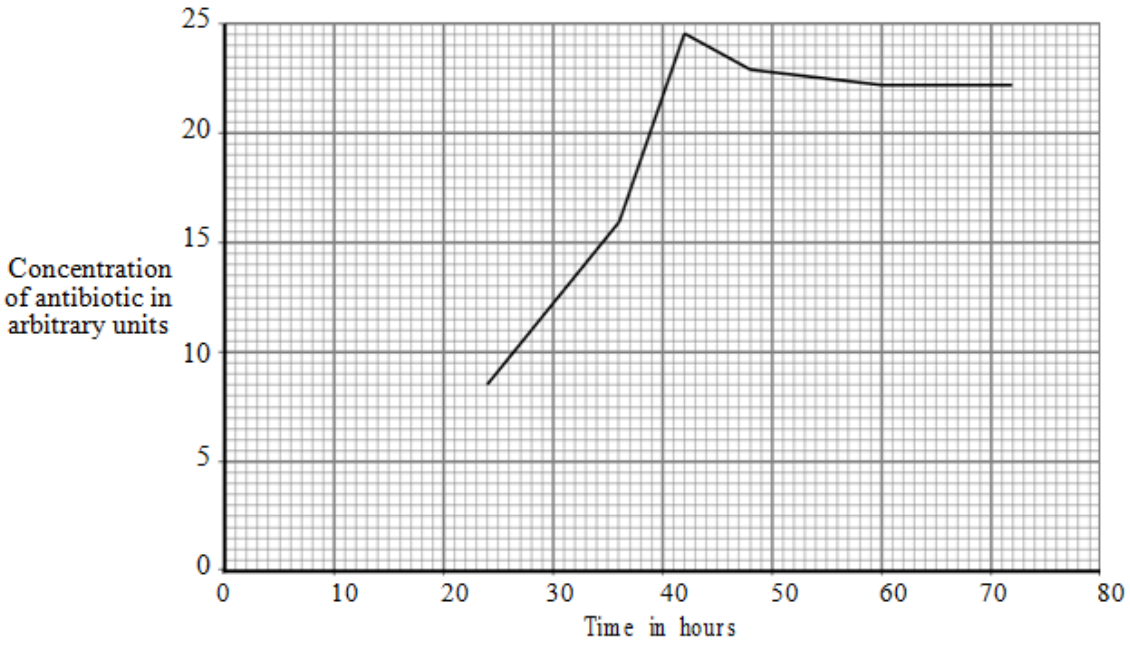
(1 mark)

(b) The scientists measured the production of an antibiotic by a mould. The graph shows their results.



(b)(i) Describe what happened to the concentration of antibiotic between 24 and 72 hours.

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(2 marks)

(b)(ii) The scientists decided to grow the mould for 42 hours in future.

Why did they choose this time?

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(1 mark)

Q:2 MRSA strains of bacteria are causing problems in many hospitals.

(a) The diagram shows a hand-gel dispenser.

Hand-gel dispensers are now placed at the entrance of most hospital wards.

Explain why.

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(2 marks)

(b) Explain, as fully as you can, how MRSA strains of bacteria became difficult to treat.

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(3 marks)

Q:3 Many strains of bacteria have developed resistance to antibiotics.

The table shows the number of people infected with a resistant strain of one species of bacterium in the UK.

Year	2004	2005	2006	2007	2008
Number of people infected with the resistant strain	3499	3553	3767	3809	4131

(a) Calculate the percentage increase in the number of people infected with the resistant strain between 2004 and 2008.

Show clearly how you work out your answer.

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Percentage increase = _____

(2 marks)

(b) Explain, in terms of natural selection, why the number of people infected with the resistant strain of the bacterium is increasing.

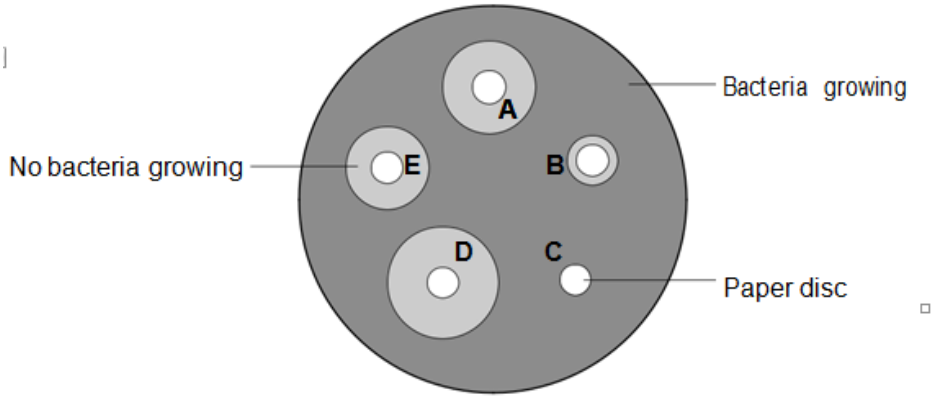
(3 marks)

Q:4 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 mark)

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

The inv xcv b cubator should not be set at a higher temperature because the higher

pathogens.

temperature might help the growth of toxins.

viruses.

(1 mark)

(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.

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(2 marks)

(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 mark)

TOTAL MARKS=