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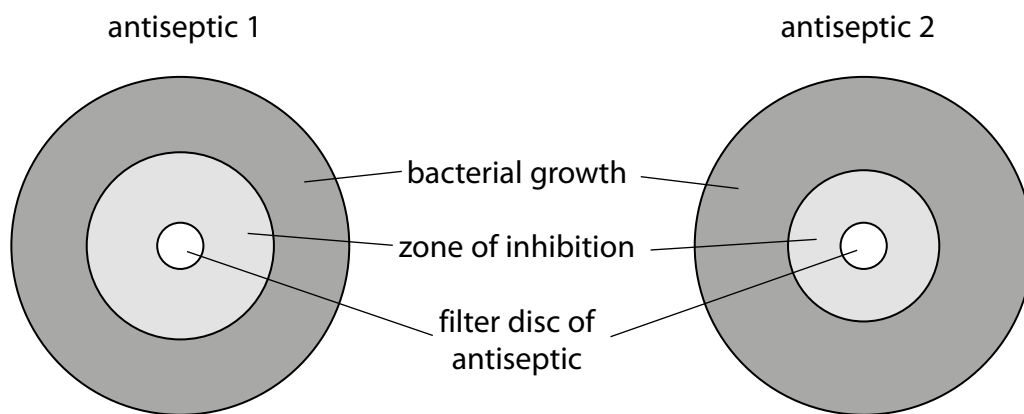
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2 *Streptococcus pyogenes* is a bacterium that causes communicable infections.

(a) Scientists tested the ability of two antiseptics to kill *Streptococcus pyogenes* bacteria.

They spread *Streptococcus pyogenes* bacteria on two agar jelly plates and placed a small disc of filter paper containing antiseptic in the centre of each dish.

Figure 3 shows the results of the test after 24 hours of incubation.



antiseptic 1 zone of inhibition	
radius (mm)	12
area (mm ²)	452

Figure 3

(i) Calculate the area of the zone of inhibition for antiseptic 2.

Give the answer to 3 significant figures.

($\pi = 3.14$)

(3)

zone of inhibition for antiseptic 2 = mm²

(ii) Explain which antiseptic is the most effective.

(2)

(iii) After the bacteria were spread on the plates, both plates were incubated for 24 hours at 37°C.

Give a reason why the plates were incubated at 37°C.

(1)

(b) The wire loop used to spread bacteria on an agar plate was heated in a Bunsen burner flame before being used.

Explain why this aseptic precaution was used.

(2)

(Total for Question 2 = 8 marks)

2 Antibiotics can be used to treat Chlamydia, which is a sexually transmitted infection.

(a) What type of pathogen causes Chlamydia?

(1)

- A bacteria
- B fungus
- C protist
- D virus

Figure 4 shows the number of new cases of Chlamydia diagnosed each year, in a region of the UK, between 2000 and 2008.

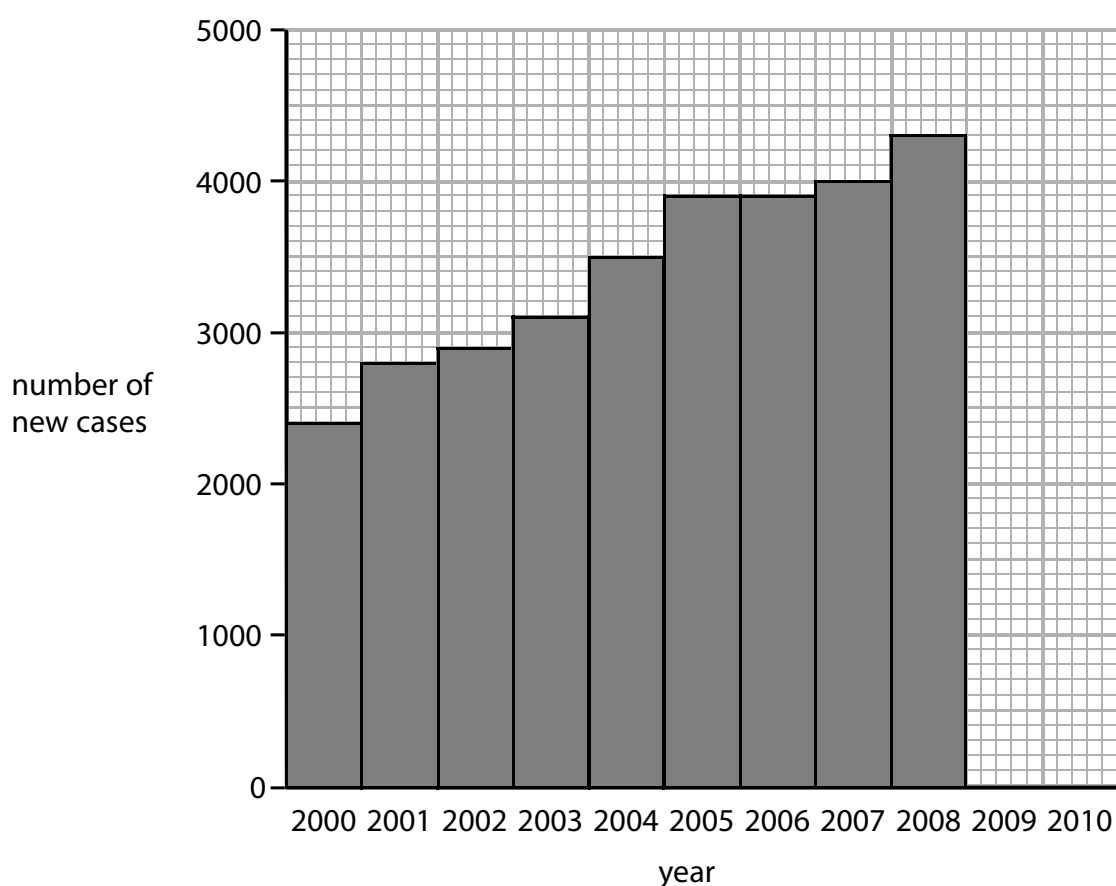


Figure 4

(b) (i) In 2009 there were 4800 new cases diagnosed.

In 2010 there were 4100 new cases diagnosed.

Plot this data on the graph in Figure 4.

(1)

(ii) Describe the trend in cases between 2000 and 2010.

(2)

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People infected with Chlamydia are more likely to be infected with the STI
Gonorrhoea.

(iii) Explain how people become infected with both Chlamydia and Gonorrhoea.

(2)

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HIV is a sexually transmitted infection.

(c) Explain how infection with HIV can lead to AIDS.

(2)

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(Total for Question 2 = 8 marks)

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Controlling infections

6 (a) Athlete's foot fungus is a pathogen.

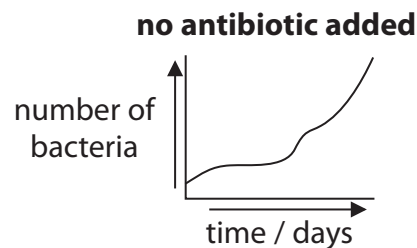
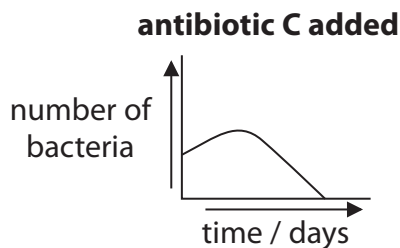
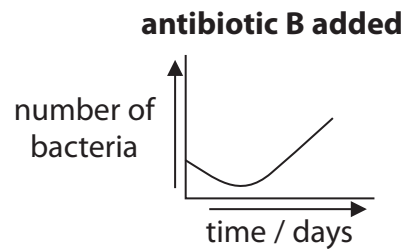
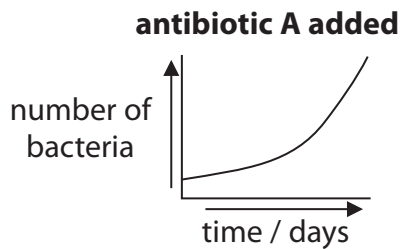
(i) Describe how athlete's foot fungus is spread.

(1)

(ii) State the type of medication that can be used to treat this pathogen.

(1)

(b) The graphs show the effect of three different antibiotics on bacterial growth.



(i) Which of these is most effective at reducing the number of bacteria?

Put a cross (☒) in the box next to your answer.

(1)

- A** antibiotic A
- B** antibiotic B
- C** antibiotic C
- D** no antibiotic



(ii) Explain how chemical defence mechanisms in the body reduce the chance of infection.

(3)

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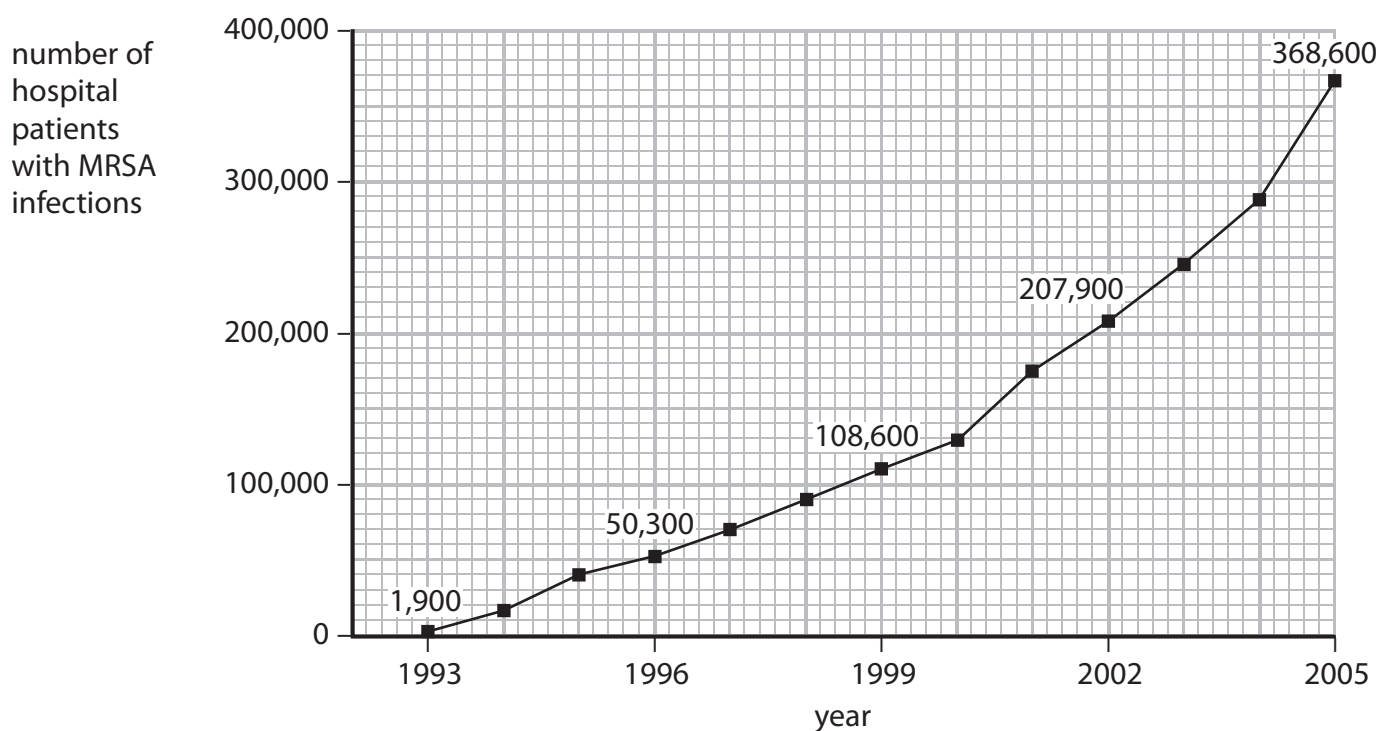
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*(c) MRSA is a bacterial infection.

The graph shows the number of cases of hospital patients with MRSA infections from 1993 to 2005.



Explain the trend in the graph, even though the patients were treated with antibiotics.

(6)

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(Total for Question 6 = 12 marks)

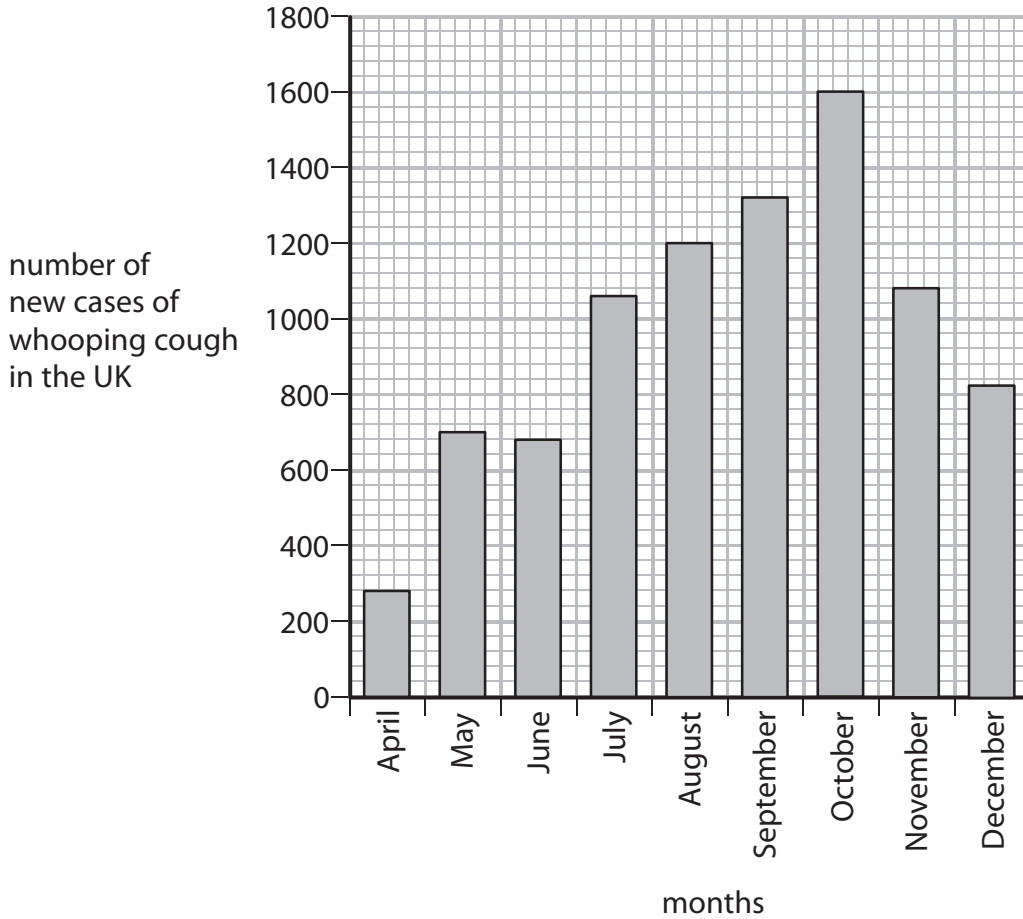
TOTAL FOR PAPER = 60 MARKS



Bacterial infection

2 In 2012 there was an outbreak of whooping cough in the UK.

The graph shows the number of new cases of whooping cough in the UK from April to December 2012.



(a) (i) Describe the trend shown in the graph from April to December.

(1)

(ii) In September 2011 there were 168 cases of whooping cough in the UK.

Calculate the difference in the number of cases of whooping cough in September 2011 and September 2012.

(2)

..... cases



(b) Whooping cough is caused by the bacterium *Bordetella pertussis*, which grows rapidly in the human body.

State the term used to describe the rapid growth of a bacterial population.

(1)

(c) Children in the UK can be immunised against whooping cough.

Suggest why outbreaks of whooping cough still occur in the UK.

(2)

(d) Describe the response of the human body to immunisation.

(3)

(Total for Question 2 = 9 marks)

