

6.3 Defence Against Infectious Disease

Question Paper

Course	DP IB Biology
Section	6. Human Physiology
Topic	6.3 Defence Against Infectious Disease
Difficulty	Hard

Time allowed: 10
Score: /5
Percentage: /100

Question 1

Routine use of antibiotics in animal feed has been common practice in livestock farming, but is now no longer widely practised.

Which statements best explain why?

- I. Use of antibiotics allows sub-standard hygiene conditions for farm animals to be kept in
- II. It encourages antibiotic resistance
- III. It is expensive
- IV. Farm animals get more nutrition from antibiotic-free feed

- A. II. and III.
- B. I. and II.
- C. I. II. and III.
- D. All of them

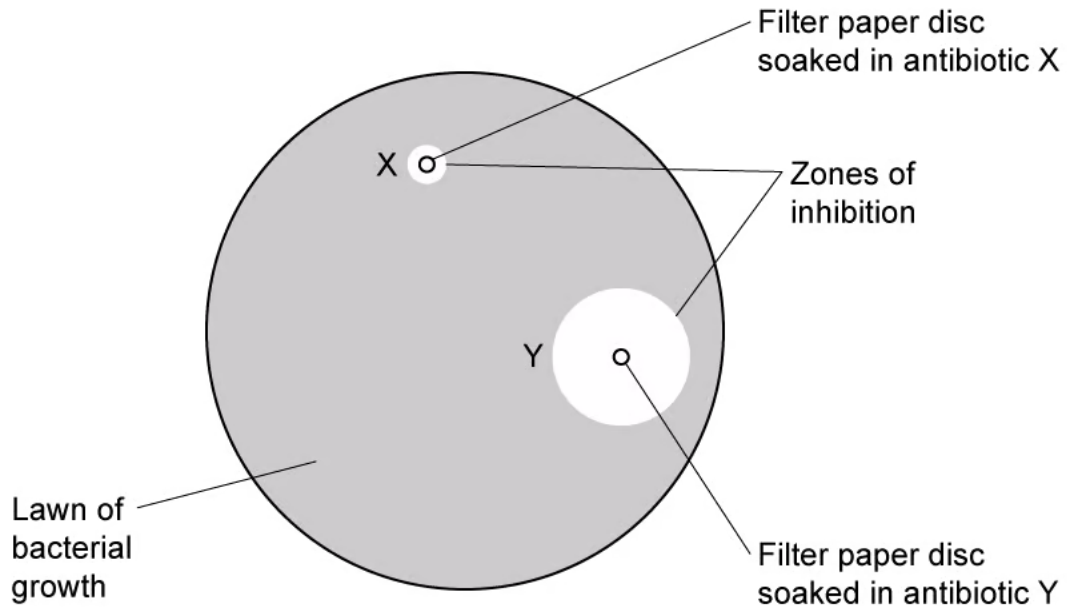
[1 mark]

Question 2

The image below shows a petri dish viewed from above. A lawn of bacteria is growing across the whole surface of the agar.

Different antibiotics, **X** and **Y** were applied to the agar before inoculating it with bacteria. Both antibiotics were applied to the discs of filter paper at the same concentration.

The plates were then incubated for 24 hours at 25°C. Zones of inhibition (areas of the dish with no bacterial growth) are shown on the diagram.



After growth, the following results were obtained.

Antibiotic	Diameter of zone of inhibition / cm
X	2.0
Y	6.0

How many times more effective was antibiotic **Y** versus antibiotic **X** in this study?

- A. 3x
- B. 9x
- C. 12x
- D. 18x

[1 mark]

Question 3

Which is a reason why fungi such as *Penicillium* have evolved to produce antibiotics?

- A. To destroy bacteria that could otherwise feed on *Penicillium*
- B. To destroy bacteria that could otherwise harm the fungus's host organisms
- C. To destroy saprophytic bacteria as a way of *Penicillium* out-competing bacterial competitors for food
- D. To kill viruses that may otherwise be pathogenic to the fungus

[1 mark]

Question 4

Some bacteria develop resistance to antibiotics by forming biofilms, which are large colonies of bacteria clumped together.

Which statement best explains how forming a biofilm might give a bacterial species resistance to antibiotics?

- A. Antibiotic molecules are physically unable to reach all bacterial cells in a biofilm
- B. Biofilms secrete chemicals which break down the antibiotic
- C. Biofilms remain in a host organism for many years
- D. Bacterial cells in a biofilm go into a suspended state but can become infectious again at a later stage

[1 mark]

Question 5

Lefamulin™ is a newly-developed antibiotic that binds to the 50S bacterial ribosomal subunit.

It was approved by the US Food and Drug Administration (FDA) in August 2019 for the treatment of pneumonia.

Which is the mode of action of Lefamulin™?

- A. Inhibits bacterial protein synthesis
- B. Perforates the bacterial cell membrane
- C. Prevents the bacterial cell wall forming
- D. Inhibits replication of bacterial DNA

[1 mark]