

Microbial Techniques

Question Paper 3

Level	A Level
Subject	Biology
Exam Board	Edexcel
Topic	Microbiology and Pathogens
Sub Topic	Microbial techniques
Booklet	Question Paper 3

Time Allowed: 15 minutes

Score: /12

Percentage: /100

Grade Boundaries:

A*	A	B	C	D	E	U
>85%	77.5%	70%	62.5%	57.5%	45%	<45%

1 Antibiotics are used in the treatment of bacterial infections.

- (a) (i) Cephalosporins are antibiotics that inhibit the production of bacterial cell walls.

Suggest why cephalosporins are **bactericidal** antibiotics.

(2)

- (ii) Quinolones are antibiotics that inhibit the synthesis of DNA in bacterial cells.

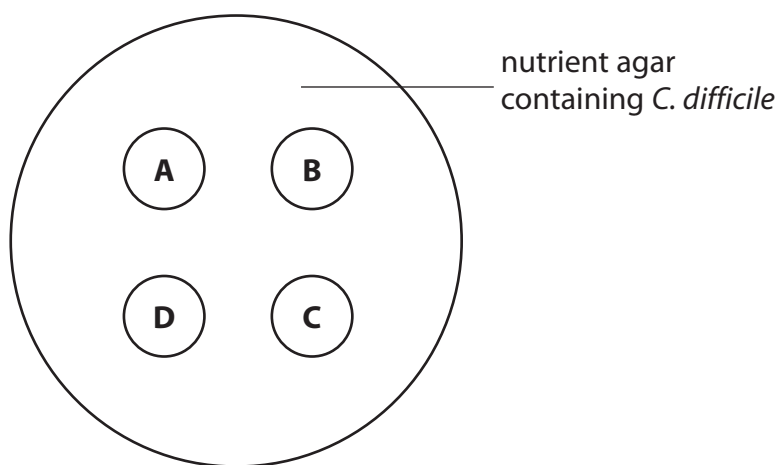
Suggest why quinolones are **bacteriostatic** antibiotics.

(2)

- (b) An investigation of the effectiveness of different antibiotics on *Clostridium difficile* was carried out by a hospital laboratory.
Several nutrient agar plates, containing *C. difficile*, were prepared.

Four discs, A, B, C and D, were placed on the surface of each plate. Each disc contained the same concentration of a different antibiotic.

The diagram below shows the position of the four discs on each agar plate, before being incubated.



After incubation, the scientists in the laboratory concluded that *C. difficile* was completely resistant to antibiotics A and C.
They also concluded that antibiotic D was more effective against *C. difficile* than antibiotic B.

- (i) Explain how the appearance of the nutrient agar plates, after incubation, would have enabled the scientists to reach these conclusions.

(3)

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For each of the statements below, put a cross (☒) in the box next to the term that completes each statement.

(ii) In this investigation, several nutrient agar plates were used for

(1)

☐ **A** accuracy

☐ **B** precision

☐ **C** reliability

☐ **D** validity

(iii) In this investigation, each disc had the same concentration of antibiotic for

(1)

☐ **A** accuracy

☐ **B** precision

☐ **C** reliability

☐ **D** validity

(c) Hospital-acquired infections caused by bacteria can be a major problem for patients.

In a study in a London hospital, it was found that pillows contaminated with bacteria could spread infections between patients.

Suggest how this hospital could improve the prevention and control of the spread of infections.

(3)

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(Total for Question 1 = 12 marks)