Model Answers: Medium

1

The correct answer is **C** because TB and cholera are both caused by bacteria, and can be treated with antibiotics.

The other options all include measles. Measles is a viral infection which is not treated with antibiotics, as viruses that cause disease in humans infect animal cells. Remember antibiotics target the growth and metabolic processes of bacterial cells that differ or are not present in animal cells (such as the 70S ribosome or a cell wall).

2

The correct answer is **C** because:

- One class of antibiotics (bacteriostatic antibiotics) are effective against bacterial because they disrupt the synthesis of the peptidoglycan cell wall
- Viruses do not have cell walls, this is why antibiotics do not affect viruses

A is incorrect as viruses need to infect a host cell in order to carry out metabolic processes, but this do not explain why antibiotics are effective against bacteria but not viruses

B & D are incorrect as while the statements are correct about viruses, they do not explain why antibiotics work on bacteria and not viruses

3

The correct answer is **D** because bacteria do not have cell walls made from cellulose, their cell walls are made of peptidoglycan (this is a polymer of sugars and amino acids)

All the other options are correct modes of action of antibiotics on bacteria.

4

The correct answer is **B** because the enzyme **β lactamase** (also known as penicillinase) breaks down penicillin. This prevents it from working on bacterial cells.

Penicillin works by preventing the formation of cross-links between peptidoglycan polymers in the cell wall. This leads to weakening of the cell wall in a growing bacterial cell.

None of the other methods would stop the action of penicillin

5

The correct answer is **D** because:

- This antibiotic has the largest zone of inhibition. This is an area where bacterial growth has not occurred, so the colour of the agar on the plate can still be visualised and should be clear.
- The larger the zone of inhibition, the greater the effectiveness of an antibiotic against that bacterial strain.

A is incorrect as this only has a very small zone of inhibition so this antibiotic has not been very effective

B is incorrect as while there is a reasonable zone of inhibition around **B**, **D** is more effective

C is incorrect as this disc is likely to be a control and did not contain any antibiotic, there should be no inhibition of growth around a control.