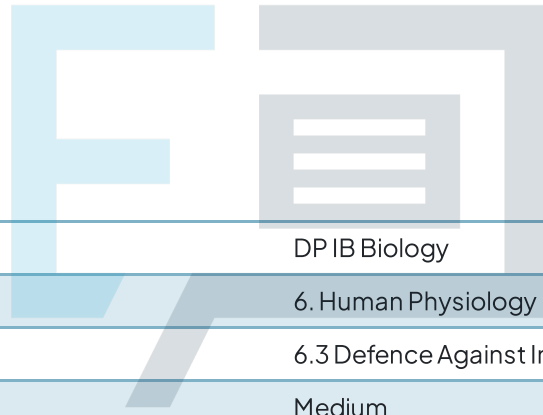




6.3 Defence Against Infectious Disease

Mark Schemes



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

Exam Papers Practice

To be used by all students preparing for DP IB Biology SL
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1

The correct answer is **A**; skin provides a tough physical barrier as well as chemical protection through sebum production. Mucus membranes produce mucus to trap microorganisms to prevent harm.

Option **B** is incorrect as hair is not considered primary defence.

Option **C** is incorrect as phagocytes and fever are part of the secondary defence systems

Option **D** is incorrect because lymphocytes produce antibodies as part of a specific immune response which could be considered the third line of defence.

2

The correct answer is **A** because the reduction of flights would reduce spread of the disease between humans in different countries.

Option **B** is incorrect as killing all birds would not prevent the spread of H5N1 as this was only given the name bird flu as it is a **cross-species transmission** from birds to humans

Option **C** is incorrect as antibiotics are not effective against avian flu, only against bacterial infections.

Option **D** is incorrect as the winter flu vaccination is designed for a different strain of flu which has different antigens and therefore triggers production of different antibodies.

3

The correct answer is **C** because one class of antibiotics (bacteriostatic antibiotics) are effective against bacteria because they disrupt the synthesis of the peptidoglycan cell wall. Viruses do not have peptidoglycan 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 does 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

4

The correct answer is **D** because this antibiotic has the largest zone of inhibition which means greater efficacy of the antibiotic against that bacterial strain.

Options **A** and **B** are incorrect because they have smaller zones of inhibition showing that the antibiotics are less effective.

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

5

The correct answer is **B** because the process is as follows:

- Endocytosis is the process of **engulfing** a pathogen that is either attached to the surface of the cell or marked by an antibody.
- A vacuole is formed around the bacteria.
- Digestive enzymes are released from **lysosomes** into the vacuole to digest the pathogen.

The whole process described above is 'phagocytosis'.

6

The correct answer is **C** – this statement is correct as lymphocytes produce antibodies to combat specific pathogens.

Answer **A**, **B** and **D** are all incorrect as they refer to phagocytes

7

The correct answer is **B**; Platelets are a component in the blood which are responsible for triggering the process by releasing clotting factors which stimulate thrombin to convert fibrinogen to fibrin which forms a mesh to collect further platelets and cell debris to form a scab.

Answers **A**, **C** and **D** are incorrect as they refer to the correct components but in the wrong order.

8

The correct answer is **C**; lymphocytes respond to specific antigens on the surface of pathogens to produce specific antibodies which can combat that pathogen.

Answer **A** is incorrect as that describes the treatment of a disease but not immunity to the disease.

Answer **B** is incorrect because monoclonal antibodies are produced in the lab to target certain antigens artificially.

Answer **D** is incorrect as phagocytosis is a non-specific immune response.



9

The correct answer is **B** because the development of new antibiotics should act to relieve the selection pressure caused by overuse of current antibiotics and therefore reduce the evolution of bacteria towards becoming resistant over time.

Options **A**, **C** and **D** are all contributing factors towards the development of resistant strains of antibiotics and are therefore incorrect.

10

The correct answer is **D** because recent developments in antiretroviral medication has made this even longer as they slow the progression of the disease

Options **A**, **B** and **C** are incorrect because many patients are asymptomatic (not showing signs of infection) for many years until the virus has reduced the levels of the immune system to a point that AIDS (Acquired Immunodeficiency Syndrome) has started. It is not possible to completely cure or remove the HIV infection from a patient.

Exam Papers Practice