Immune System & Physical and Chemical Barriers

1 Name two physical barriers that humans have to prevent invasion by pathogens and explain how they work.

- Skin - physical barrier between outside world and body - produces oils and antimicrobial substances that kill pathogens
- Mucus in nose - traps particles of dust and microbes
- Mucus in bronchi - traps particles of dust and microbes - cilia brush this up to oesophagus and swallow to stomach

[4 marks]

2 Name a chemical barrier that humans have to prevent invasion by pathogens and explain how it works.

- Acid in the stomach - that kills pathogens due to low pH
- Any other examples like tears in eyes

[2 marks]

3 If a pathogen does make it inside the body, then the immune system takes over

a) What type of cell is responsible for carrying out the immune response?

- White blood cells

[1 mark]

b) What is the difference between antibodies and antigens?

- Antibodies are produced by our white blood cells and are specific for an antigen, which is a material that has been detected as foreign by the immune system

[2 marks]

c) What is phagocytosis?

- When a white blood cell / phagocyte engulfs a pathogen
- First is locates the pathogen (due to chemicals the pathogen release)
- Then it binds it
- Then it engulfs it
- Then it breaks it down, killing it

[4 marks]

d) How do antitoxins work?

- They bind and neutralise toxins which are released by some pathogens

[1 mark]

e) What are antibodies?

- Antibodies are proteins produced by white blood cells that bind antigens and act as a signal for immune system to find them.

[1 mark]

[Total 15 marks]