



Edexcel GCSE Biology • Topic 5 Health, disease and the development of medicines

Human defences and immunity: practice questions

4 questions · 16 marks · mark scheme at the back

For Edexcel GCSE Biology 1BI0 and Combined Science 1SC0, **Triple only** is not in Combined Science. **Higher tier** is only on the Higher paper.

Name

Total / 16

- 1** Describe how the nose and airways help to prevent pathogens reaching the lungs. **[3 marks]**

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- 2** A child has chickenpox once and does not usually become ill with it again. Explain why the child does not become ill if they are infected with the chickenpox virus a second time. **[3 marks]**

[illegible]

- 3** Explain how the immune system responds when a pathogen enters the body for the first time, and how immunisation can prevent illness when the same pathogen enters the body again. **[6 marks]**

[illegible]

Discuss the advantages and disadvantages of immunisation, including the idea of herd immunity.

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Mark scheme

One mark for each point unless a maximum is given. Words in brackets are not needed for the mark.

1. [3]

- mucus traps pathogens (1)
- cilia (hairs) on the cells lining the airways (1)
- move the mucus away from the lungs / up to the throat (1)

2. [3]

- memory lymphocytes were made during the first infection (1)
- they recognise the antigens and respond faster (1)
- more antibodies are made quickly so the pathogen is destroyed before symptoms develop (1)

3. [6]

Level 3 5-6	A clear, well-structured explanation covering both the first response (antigens, antibodies, memory lymphocytes) and how immunisation leads to a faster, larger secondary response. Scientific terms are used accurately and links between ideas are clear.
Level 2 3-4	Explains most of the first response or immunisation, with some correct links. There may be gaps, such as not linking memory lymphocytes to the secondary response.
Level 1 1-2	Some correct statements about antibodies or immunisation, but little explanation and few links between ideas.

Indicative content

- antigens on the pathogen trigger an immune response
- the response produces antibodies that bind to the antigens and help to destroy the pathogen
- antigens also trigger production of memory lymphocytes
- immunisation uses an inactive form of the pathogen, which cannot cause the disease
- the inactive pathogen still has antigens, so antibodies and memory lymphocytes are produced
- if the live pathogen enters later, memory lymphocytes carry out a secondary response
- this is faster and produces more antibodies, so the pathogen is destroyed before the person becomes ill

4. [4] Triple only

- advantage: protects the individual from a serious disease / prevents epidemics (1)
- herd immunity: when a large proportion of the population is immune, the pathogen cannot spread easily (1)
- so people who are not immune / cannot be vaccinated, such as babies, are protected (1)
- disadvantage: some people have side effects, such as a sore arm or fever, or rarely a serious reaction (1)
- disadvantage: it does not work for everyone / boosters may be needed / new vaccines are needed if the pathogen changes (1)
- Max 4: at least one advantage and one disadvantage needed for full marks