

Blood and the immune system: practice questions

7 questions • 24 marks • mark scheme at the back

For Pearson Edexcel International GCSE Biology 4BI1 and Science (Double Award) 4SD0. **Biology only** is not in the Double Award and is only examined on Paper 2.

Name

Total / 24

- 1** State the four components of blood. [4 marks]

- 2** Plasma transports many substances around the body. Give three substances that are transported by plasma. [3 marks]

- 3** Which feature of a red blood cell increases the amount of oxygen it can carry? [1 mark]

- A. ☐ A large nucleus
B. ☐ A thick cell wall
C. ☐ Haemoglobin inside the cell
D. ☐ Many mitochondria

- 4** Explain how three adaptations of red blood cells make them suitable for transporting oxygen. [3 marks]

Mark scheme

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

1. [4]

- red blood cells (1)
- white blood cells (1)
- platelets (1)
- plasma (1)

2. [3]

- carbon dioxide (1)
- digested food / glucose / amino acids (1)
- urea (1)
- hormones (1)
- heat energy (1)
- Max 3

3. [1]

C C (1)

4. [3]

- biconcave shape gives a large surface area for oxygen to diffuse in and out (1)
- no nucleus, so there is more room for haemoglobin (1)
- contains haemoglobin which combines with oxygen (1) allow forms oxyhaemoglobin

5. [3]

- antibodies are specific (1)
- the shape of the antibody fits the antigen on that pathogen only (1)
- a different pathogen has different antigens, so a different antibody is needed (1)

6. [6] **Biology only**

Level 3 5-6	A clear, logical explanation covering the vaccine, the first response, memory cells and all three features of the faster second response (sooner, faster, greater quantity). Scientific terms are used accurately.
Level 2 3-4	Explains most of the sequence, including memory cells and at least one feature of the faster response. Some steps may be missing or unclear.
Level 1 1-2	Some correct points, such as the vaccine contains antigens or antibodies are made, but little explanation of memory cells or the second response.

Indicative content

- a vaccine contains a harmless form of the pathogen (dead or weakened) with its antigens
- the antigens trigger lymphocytes to release antibodies, without the person becoming ill
- memory cells are made and stay in the body
- if the live pathogen enters, memory cells recognise it
- antibody production happens sooner
- antibodies are produced faster and in greater quantity
- the pathogen is destroyed before it can cause the disease

7. [4] **Biology only**

- platelets collect at the wound / release chemicals (1) allow enzymes for chemicals
- soluble fibrinogen is changed into insoluble fibrin (1)
- fibrin forms a mesh that traps red blood cells to form a clot / scab (1) allow net / web for mesh
- the clot prevents blood loss and prevents entry of micro-organisms / pathogens (1)