OCR GCSE 21ST CENTURY BIOLOGY B · J257

BIOLOGY



EXAM QUESTION PACK

B2.2 HOW DO ORGANISMS PROTECT THEMSELVES AGAINST PATHOGENS? (FOUNDATION)

SCORE	PERCENTAGE
/43	%

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1. John grows tomatoes in his greenhouse.



(i) One morning John notices the leaves of his plant look different.

The tomato plant has a disease called blight.



Suggest the impact this may have on the plant.

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[1]

(ii) Pesticides can be used to try to kill plant diseases such as blight on tomato plants.

State **one** way that a plant can naturally defend itself against pathogens.

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[1]

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2. When bacteria enter the body, they multiply. The body launches an immune response.

What is the name given to the proteins produced by the body to attack the multiplying bacteria?

Put a tick (✓) in the correct box.

Antibodies	☐
Antigens	☐
Antibiotics	☐
Enzymes	☐

[1]

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3(a). Plants also need to protect themselves from disease.

Give two **physical** defences used by plants against disease.

1

2

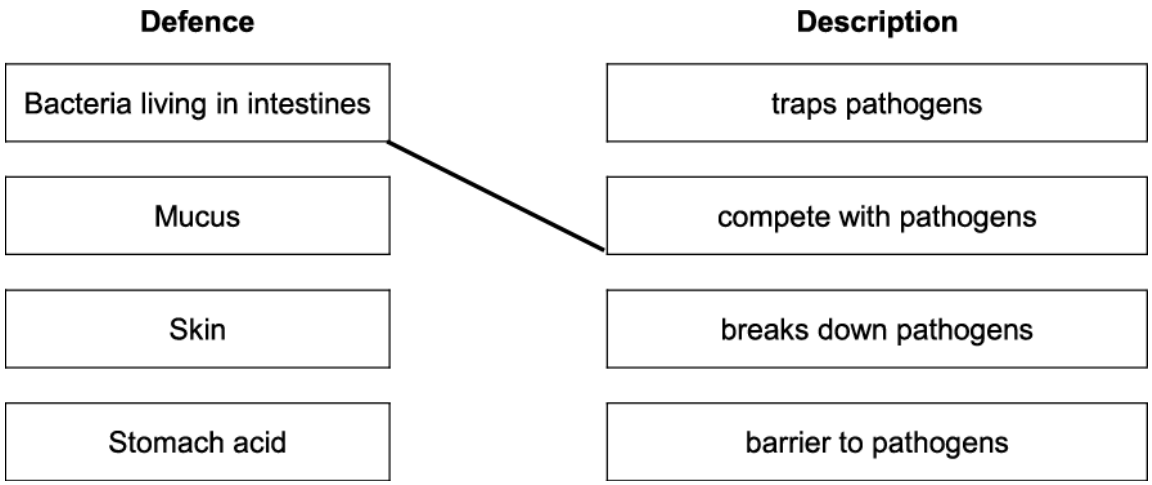
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[2]

(b). Humans have defences that make it difficult for pathogens to enter.

Use **straight lines** to link each **defence** to its correct **description**.

One line has been drawn for you.



[2]

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4(a). Human blood contains different components.

Write down the job of:

white blood cells _____

_____

platelets _____

_____

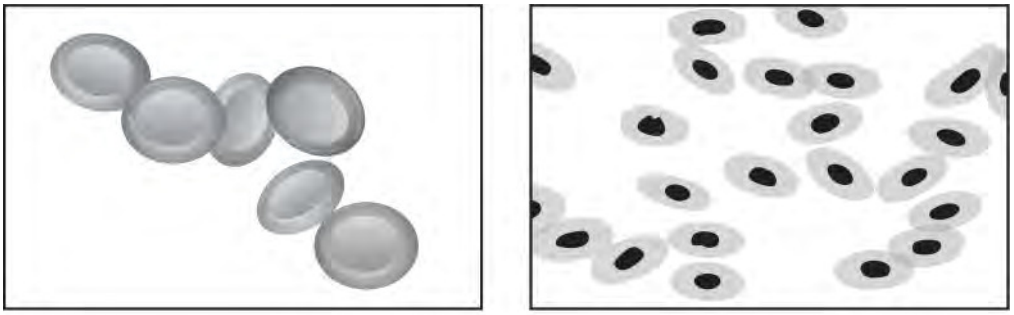
plasma _____

_____

[3]

(b). Blood also contains red blood cells.

Look at the diagrams.
They show human red blood cells and frog red blood cells.



Human red blood cells

Frog red blood cells

Human red blood cells are better adapted to the job that they do than frog red blood cells.

Use the diagrams to suggest how.

_____

_____

_____ [2]

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5(a). There are more red blood cells than white blood cells in the blood sample above.

Estimate the ratio of red blood cells to white blood cells.

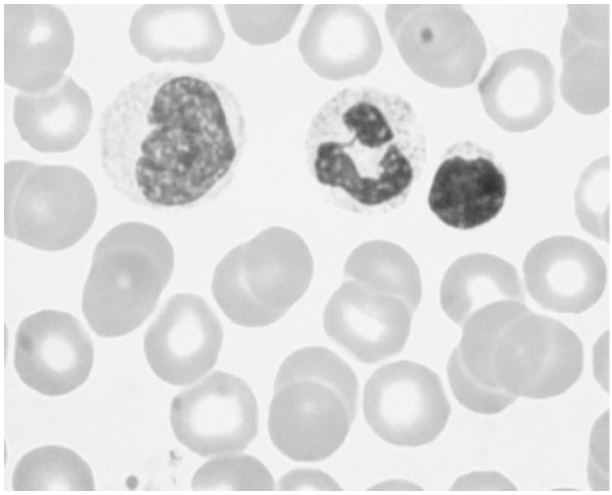
---------- [1]

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(b). Blood is made up of cells, plasma and platelets.

The picture below is of blood cells as seen down a microscope.



Draw a labelled scientific drawing of a white blood cell in the space below.

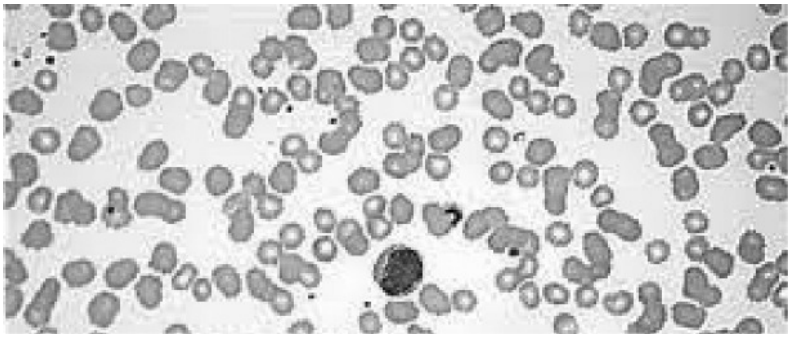
Label the nucleus and cell membrane.

[4]

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6. Blood consists of many different components.



sample of human blood

Name these components and describe their jobs in the human body.

The quality of written communication will be assessed in your answer.

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[6]

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7(a). Jake accidentally cuts himself.

The cut becomes infected with bacteria.

Jake begins to feel ill. He has septicaemia (blood poisoning).

Septicaemia can kill.

Complete the sentences to explain what the bacteria are doing to make Jake feel ill.

Choose only words from this list.

antibiotics **damage** **help** **oxygen** **stimulate** **toxins**

The bacteria in Jake's cut multiply rapidly. They spread into his blood stream.

The bacteria _____ Jake's cells and release

_____ into his blood stream.

[2]

(b). For the first few hours, the bacteria divide into two every twenty minutes.

100 bacteria entered Jake's wound when he cut himself.

How many bacteria are in Jake's wound after 2 hours?

Show your working.

number of bacteria in Jake's wound after two hours. _____ **[2]**

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(c). It is important for Jake to produce antibodies against these bacteria as quickly as possible.

Use the information from parts **(a)** and **(b)** to explain why.

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[3]

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8(a). Most women diagnosed with cancer of the ovaries will have an operation to remove their ovaries.

Before the operation, the doctor will discuss the risks of the operation with the patient.

Give **one** example of a risk to the patient.

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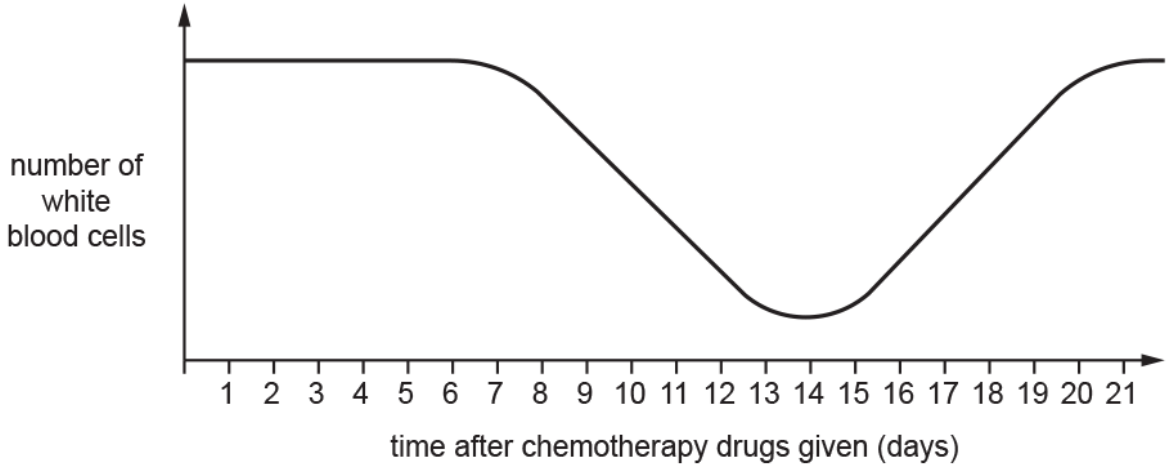
[1]

(b). After surgery the patient may be given chemotherapy drugs to kill any remaining cancer cells.

Chemotherapy also affects the number of white blood cells in a patient.

The graph shows what happens to the number of white blood cells during chemotherapy.

The patient receives the chemotherapy drugs on day 1.



(i) Describe what happens to the number of white blood cells after chemotherapy.
Use information from the graph in your answer.

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[2]

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(ii) Explain how white blood cells protect us from disease **and** how they are adapted for this function.

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[3]

(iii) White blood cells are one component of the blood.

There are three other major components of the blood, which all have specific functions.

Draw a line to link each **blood component** to its **function**.

Blood component	Function
Plasma	Cell fragment that helps the blood clot at injury sites and helps seal wounds.
Red blood cell	Transports dissolved substances such as hormones, urea and food molecules.
Platelet	Contains haemoglobin and transports oxygen around the body.

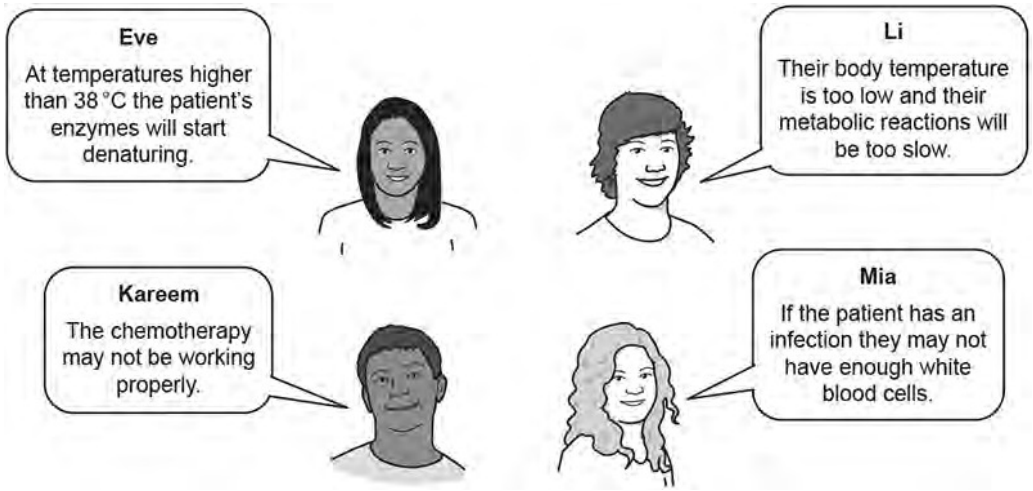
[2]

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(iv) A chemotherapy patient is told to go to accident and emergency if they feel ill and have a temperature above 38 °C.

Some students have a discussion about why this is important.



Which **two** students made the best suggestions?

---------- and ---------- [2]

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9. Plant cells make their own antimicrobial substances.

Explain how antimicrobial substances help plants to survive and why this is essential for **human** survival.

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[3]

END OF QUESTION PAPER

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