OCR GCSE 21ST CENTURY BIOLOGY B · J257

BIOLOGY



EXAM QUESTION PACK

B2.1 WHAT ARE THE CAUSES OF DISEASE? (FOUNDATION)

SCORE	PERCENTAGE
/27	%

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1.

(i) HIV is an infection which causes a weakened immune system.

State **two** ways of passing HIV from one person to another.

1

2

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[2]

(ii) People with HIV are at risk from opportunistic infections.

These infections take advantage of a weakened immune system.

The most threatening infections occur when the person has a CD4 count less than 200.

4 individuals with HIV had their CD4 count measured.

Individual	CD4 count
1	500
2	210
3	160
4	175

Place the individuals in order of those with the greatest risk of contracting an opportunistic infection.

....

most risk least risk

[1]

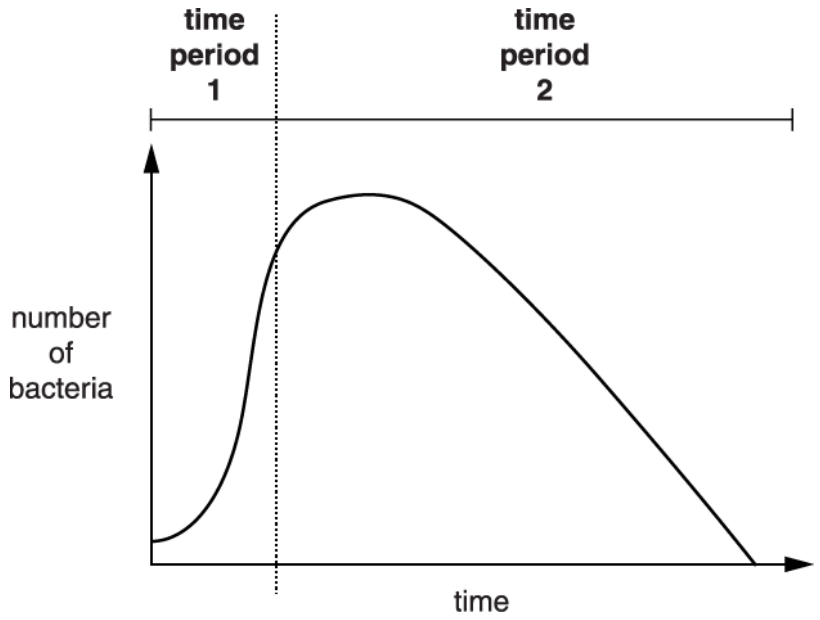
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2(a). Dan works in his garden. He cuts his leg.

Some bacteria enter the cut. The bacteria start to reproduce.

The graph shows how the number of bacteria in the cut changes over time.



During **time period 1**, the bacteria are reproducing quickly.

Each bacterium divides to produce two bacteria. This happens once every 20 minutes.

(i) At the start of **time period 1** there are 50 bacteria.

Calculate how many bacteria there will be after 2 hours if all bacteria survive.

number of bacteria = _____ **[1]**

(ii) Dan will show symptoms of infection when there are more than 20 000 bacteria in the cut.

Dan thinks this will take days.

Look again at your answer to part **(i)**.

Explain why Dan is wrong.

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[2]

(iii) Write down **two** ways in which bacteria can cause symptoms of infection in the body.

[2]

(b). Look at time **period 2** on the graph.

Some of the bacteria are dying.

(i) Draw an **X** on the graph to show a time when the number of new bacteria being produced is equal to the number of bacteria dying.

[1]

(ii) What actions take place inside Dan's body to cause the shape of the graph in **time period 2**?

[2]

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3(a). Tony has pneumonia.
His doctor prescribes antibiotics.

Suggest the type of microorganism that causes pneumonia.

[1]

(b). The microorganism reproduces rapidly.
It divides into 2 every 20 minutes.
Starting with 1 microorganism, what is the maximum number that could be present in Tony's body after 2 hours?
You **must** show your working.

Put a tick (✓) in the box next to the correct answer.

32 ☐

64 ☐

128 ☐

256 ☐

[2]

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4(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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5. Cancer of the ovaries is a common type of cancer in women.

Complete the following sentences about cancer.

Put a (ring) around the correct option in each sentence.

Cancer is a **communicable** / **non-communicable** / **sexually-transmitted** disease.

It is caused by changes in the **cell membranes** / **DNA** / **mitochondria**.

The changes cause cells to divide many times by

asexual reproduction / **meiosis** / **mitosis**.

This uncontrolled growth and division creates **an infection** / fatty deposits / **a tumour**.

[4]

6. Amir works in a laboratory. His job is to identify the pathogens that cause plant diseases.

Different types of pathogens cause different diseases in plants.

Draw lines to join each **type of pathogen** with the correct **disease** it causes.

Type of pathogen	Disease
Bacterium	Ash dieback
Fungus	Tobacco mosaic
Virus	Crown gall

[2]

END OF QUESTION PAPER

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