OCR GCSE 21ST CENTURY BIOLOGY B · J257

BIOLOGY



EXAM QUESTION PACK

B2.4 HOW CAN WE IDENTIFY THE CAUSE OF AN INFECTION? (HIGHER)

SCORE	PERCENTAGE
/15	%

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1. Aseptic techniques must be used when culturing organisms.

Give an example of an aseptic technique and explain why it is used.

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[2]

2. To confirm that a female is pregnant a pregnancy test will be done. This test uses monoclonal antibodies.

(i) Describe how monoclonal antibodies are produced.

---

[3]

(ii) Antibodies are proteins.

The statements below describe protein synthesis.

A The mRNA travels to a ribosome in the cytoplasm.

B A copy of the gene is made from messenger RNA.

C The ribosome joins the amino acids together in the correct order.

D The gene that codes for the protein is found in the DNA.

Put the statements in the correct order.

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[1]

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

Amir has a sample of one species of bacteria from an infected plant.

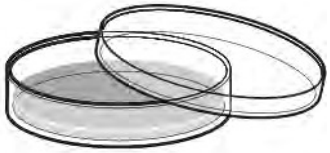
He wants to test the effectiveness of different antibiotics against this species of bacteria.

Amir must start by transferring bacteria from the sample bottle into four Petri dishes containing agar jelly.

He needs to set up four identical dishes of this species of bacteria.



glass bottle containing the sample of bacteria



Petri dish containing agar jelly

He intends to pour some of the liquid from the glass bottle into each Petri dish.

(i) Write down **two** ways he could improve his method and explain why each is an improvement.

Improvement 1 ----------

Explanation ----------

Improvement 2 ----------

Explanation ----------

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[4]

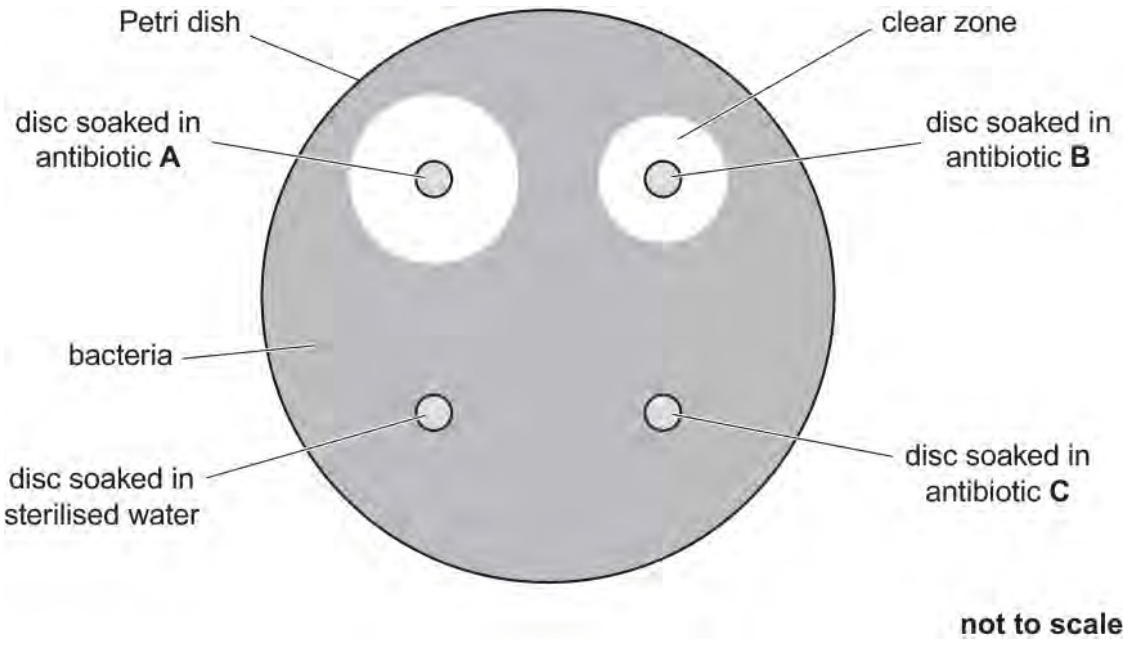
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After transferring bacteria from the sample to the four Petri dishes, Amir adds four different paper discs to each dish.

The paper discs have been soaked in different solutions.

Amir places the dishes in an incubator overnight.
The bacteria grow to cover the surface of the agar jelly.

The diagram shows what Amir sees on one of the dishes after it has been incubated.



(ii) The diameter of the clear zone around the disc soaked in antibiotic **A** is 23 mm.

Calculate the area of this clear zone.

Use the equation: area of clear zone = $3.14 \times r^2$.

Give your answer to **3**significant figures.

Area of clear zone = ... mm^2**[3]**

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(iii) **Table 4.1** shows Amir's results for all four dishes.

Disc soaked in	Area of clear zone (mm^2)			
	Petri dish 1	Petri dish 2	Petri dish 3	Petri dish 4
Antibiotic **A**		363	346	346
Antibiotic **B**	227	254	227	214
Antibiotic **C**	0	0	0	0
Sterilised water	0	0	0	0

Table 4.1

Suggest **two** possible explanations for the results for antibiotic **C**.

1 ----------

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2 ----------

---[2]

END OF QUESTION PAPER

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