



QUESTION WORKBOOK

Industrial biotechnology: growing microorganisms on purpose

Gene regulation, genomics and biotechnology · Unit B17

OCR A 6.2.1 · Edexcel A 4.14, 8.17 · Edexcel B 6.1 i, 6.1 ii, 6.1 iii, 6.1 v

7 questions · 24 marks

PRINT EDITION

Every question in this book has a code beside its number.
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SECTION A · Short, 1 to 2 marks**A1**

IB-Q7

Apart from their rapid growth, state two reasons why industry grows microorganisms rather than farming a plant or an animal for the same product.

[2]

SECTION B · Standard, 3 to 5 marks**B1**

IB-Q1

Describe how the conditions inside a stirred-tank fermenter are held at the optimum for the production organism, naming the part of the fermenter responsible in each case.

[4]

B2

IB-Q2

Compare batch fermentation with continuous fermentation, referring to the closed-culture growth curve in your answer.

[4]

B3

IB-Q3

A company cultures a bacterium that secretes a new antibiotic only once the culture stops dividing. It also sells the bacterial biomass itself as animal feed. Suggest which fermentation method suits each product, and suggest why.

[4]

B4

IB-Q4

A local authority proposes to replace part of the meat served in its school meals with mycoprotein. Evaluate this proposal.

[4]

B5

IB-Q5

Explain why a fermenter must be run under aseptic conditions, and explain how those conditions are achieved at industrial scale.

[3]

B6

IB-Q6

A fermenter is inoculated with 5.0×10^4 bacteria of a strain whose doubling time under these conditions is 20 minutes. Calculate the number of bacteria present after 4 hours of exponential growth.

[3]

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