



QUESTION WORKBOOK

Cofactors, coenzymes and where enzymes work

Enzymes and metabolic control · Unit B03

OCR A 2.1.4 · Edexcel A 2.10, 3.3 · Edexcel B 1.5 vii · CAIE 3.1, 3.2

15 questions · 45 marks

NAVY SCREEN EDITION

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SECTION A · Short, 1 to 2 marks**A1**

CCW-Q6

State what is meant by a coenzyme, and name the vitamin from which the coenzyme NAD is made.

[2]

A2

CCW-Q14

State what is meant by a prosthetic group, and state one named example of one.

[2]

A3

CCW-Q15

Name the organelle in which catalase acts, and name the class, intracellular or extracellular, that this makes catalase.

[2]

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

CCW-Q1

A prolonged dietary shortage of vitamin B3 damages tissues that respire heavily, such as skin and the nervous system. Suggest why.

[4]

B2 Compare an intracellular enzyme with an extracellular enzyme, giving a named example of each and comparing the conditions each must tolerate. [4]
CCW-Q7

B3 A patient's diet is severely deficient in vitamin B5. Suggest the effect this has on the Krebs cycle, and suggest why a wide range of tissues would be affected rather than just one. [4]
CCW-Q8

B4 Compare a coenzyme with a prosthetic group, giving a named example of each. [3]
CCW-Q2

B5 A purified sample of amylase hydrolyses starch only when chloride ions are present in the solution. Explain this observation. [3]
CCW-Q3

B6 Explain why the enzymes that digest food in the gut must be extracellular, and name two such enzymes. [3]
CCW-Q4

B7 Two enzymes, P and Q, act on the same substrate and have similar V_{max} values. Enzyme P has a K_m of 0.2 mmol dm^{-3} and enzyme Q a K_m of 4.0 mmol dm^{-3} . Explain which enzyme has the higher affinity for the substrate, and which converts more substrate when the substrate concentration is low. [3]
CCW-Q5

B8 Name the vitamin from which coenzyme A is made, name the coenzyme it forms, and name the pathway it carries acetate into. [3]
CCW-Q9

B9 Explain why carbonic anhydrase's zinc ion is classed as a prosthetic group rather than as a cofactor that visits and leaves, even though it is a single inorganic ion. [3]
CCW-Q10

B10 Describe the role of NAD in aerobic respiration, and describe what happens to the coenzyme once it has delivered its hydrogen. [3]
CCW-Q11

B11 Explain why a cofactor is not shown as one of the products of a reaction it makes possible, even though the reaction could not proceed without it. [3]
CCW-Q12

B12 Hexokinase has a K_m far below the normal blood glucose concentration. Explain what this tells us about how close to V_{max} hexokinase is working under normal conditions, and explain why its rate barely changes when blood glucose rises after a meal. [3]
CCW-Q13

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