



QUESTION WORKBOOK

Anaerobic respiration and the respiratory quotient

Respiration and cellular energy · Unit B12

AQA 3.5.2 · OCR A 5.2.2, 5.2.3 · Edexcel A Topic 7.5–7.7 · CAIE 12.2, 12.3

7 questions · 23 marks

PRINT EDITION

SECTION A · Short, 1 to 2 marks

- A1** State the products formed when yeast respires glucose anaerobically, and state the net number of ATP molecules gained per molecule of glucose. [2]

SECTION B · Standard, 3 to 5 marks

- B1** Explain why glycolysis can continue in a muscle cell that has run short of oxygen, and explain what the reduction of pyruvate to lactate achieves. [4]

- B2** Compare the anaerobic pathway followed in an animal muscle cell with the anaerobic pathway followed in yeast. [4]

- B3** Germinating seeds are placed in a respirometer at 20 °C. With soda lime present the fluid drop moves 50 mm towards the seeds in ten minutes; with the soda lime removed and everything else unchanged it moves 5 mm towards the seeds in ten minutes. The capillary has a cross-sectional area of 1.0 mm². Calculate the respiratory quotient and state which substrate it indicates. [4]

- B4** Explain why a gram of lipid releases roughly 39 kJ when it is respired while a gram of carbohydrate releases only about 16 kJ. [3]

- B5** Explain why a respirometer investigation includes a second tube holding glass beads of the same mass, and why the whole apparatus is left to equilibrate in a water bath before the first reading is taken. [3]

- B6** A sealed flask of yeast, fed on glucose, is found to have a respiratory quotient of 1.6. Suggest what this value shows about the respiration taking place in the flask.

[3]
