Higher Combined version — Higher Tier (★) included; Separate-only (◆) removed.

Q1. Write the word equations for anaerobic respiration in (a) animals and (b) yeast.

[2 marks]

Q2. Explain what an oxygen debt is and how it is repaid after exercise.

[3 marks]

Q3. Describe TWO commercial uses of fermentation in yeast.

[2 marks]

★ HIGHER TIER

Q4. ★ Compare the energy released, products and location in the cell for aerobic vs anaerobic respiration.

[3 marks]

Total: 10 marks

Q1 (2 marks)

Write the word equations for anaerobic respiration in (a) animals and (b) yeast.

- (a) Glucose → lactic acid (+ small amount of energy) [1]
- (b) Glucose → ethanol + carbon dioxide (+ small amount of energy) [1]

Q2 (3 marks)

Explain what an oxygen debt is and how it is repaid after exercise.

- During intense exercise, muscles use anaerobic respiration → lactic acid accumulates [1]
- After exercise, extra oxygen is needed to convert lactic acid back to glucose (in liver) [1]
- This extra O■ requirement is the oxygen debt — repaid by continued elevated breathing rate [1]

Q3 (2 marks)

Describe TWO commercial uses of fermentation in yeast.

- Brewing: yeast produces ethanol → beer/wine [1]
- Bread-making: yeast produces CO■ → dough rises [1]

Q4 (3 marks) [★ HT]

★ *Compare the energy released, products and location in the cell for aerobic vs anaerobic …*

- Aerobic: large amount of energy (~38 ATP); anaerobic: very little (~2 ATP) [1]
- Aerobic: CO■ + water; anaerobic: lactic acid (animals) or ethanol + CO■ (yeast) [1]
- Aerobic: mitochondria; anaerobic: cytoplasm [1]