

Q1 (1 mark)

- The process of releasing energy from glucose

Q2 (1 mark)

- Mitochondria

Q3 (1 mark)

- To release energy

Q4 (1 mark)

- Oxygen

Q5 (2 marks)

Any two:

- Carbon dioxide
 - Water
 - Energy (keep in mind energy cannot be created only transferred/released)
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Q6 (2 marks)

Any two:

- Plants
 - Animals
 - Microorganisms
-

Q7 (2 marks)

Any two:

- During intense exercise
 - When oxygen in the environment is low
 - In muscles during heavy activity
-

Q8 (2 marks)

- Glucose + oxygen → carbon dioxide + water (+ energy)
 - 1 mark each for reactants and products
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Q9 (3 marks)

- Releases energy for cell activities (1)
 - Needed for movement, growth, repair (1)
 - Powers chemical reactions in cells (1)
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Q10 (3 marks)

- Happens when oxygen is low (1)
 - Glucose is broken down without oxygen (1)
 - Produces lactic acid (1)
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Q11 (3 marks)

- Breakdown of glucose without oxygen (1)
 - Occurs in microorganisms like yeast (1)
 - Produces ethanol and carbon dioxide (1)
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Q12 (4 marks)

- Muscles need energy for contraction (1)
 - Oxygen supply becomes insufficient (1)
 - Anaerobic respiration occurs (1)
 - Lactic acid builds up causing pain (1)
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Q13 (4 marks)

- Respiration releases energy from glucose (1)
- Energy used for chemical reactions (1)
- Includes growth and repair (1)
- Includes processes like active transport or protein synthesis (1)

Q14 (4 marks)

- Yeast carries out anaerobic respiration (1)
- Produces carbon dioxide which makes bread rise (1)
- Produces ethanol used in alcoholic drinks (1)
- This process is fermentation (1)

Q15 (6 marks)

Level 1 (1-2 marks)

- Basic mention of anaerobic respiration

Level 2 (3-4 marks)

- Some correct processes or products

Level 3 (5-6 marks)

- Clear explanation of humans and microorganisms with equations

Expected content:

- Glucose → lactic acid (humans) (1)
- Occurs when oxygen is low (1)
- Causes muscle fatigue (1)
- In yeast: glucose → ethanol + carbon dioxide (1)
- Called fermentation (1)
- Releases less energy than aerobic respiration (1)

Example full-mark answer:

“Anaerobic respiration happens when there is not enough oxygen. It releases less energy than aerobic respiration. In humans, glucose is broken down into lactic acid, which can cause muscle fatigue. In microorganisms such as yeast, glucose is broken down into ethanol and carbon dioxide. This process is called fermentation and is used in brewing alcohol and making bread rise.”

Q16 (6 marks)

Level 1 (1-2 marks)

- Basic differences stated

Level 2 (3-4 marks)

- Some correct comparisons

Level 3 (5-6 marks)

- Clear, detailed comparison

Expected content:

- Aerobic uses oxygen (1)
- Anaerobic does not use oxygen (1)
- Aerobic produces carbon dioxide and water (1)
- Anaerobic produces lactic acid or ethanol + carbon dioxide (1)
- Aerobic releases more energy (1)
- Anaerobic releases less energy (1)

Example full-mark answer:

"Aerobic respiration uses oxygen to break down glucose and produces carbon dioxide and water, releasing a large amount of energy. Anaerobic respiration does not use oxygen and produces lactic acid in humans or ethanol and carbon dioxide in yeast. It releases much less energy than aerobic respiration. Aerobic respiration is more efficient, while anaerobic respiration is used when oxygen is limited."