

Respiration in Plants — Assignment 1

Class 11 Biology · Topic-wise question bank covering every concept of the chapter · Narayan Gurukul Academy

Instructions: (1) Attempt all questions. This worksheet walks through every concept of the chapter, topic by topic.
(2) The interactive MCQ version of these questions (with instant answer reveal) is available on the notes page.
(3) Universal values: $g = 10 \text{ m/s}^2$ unless stated. Give answers with correct SI units.

Overview of Cellular Respiration

MCQ Questions (choose the correct option)

- Cellular respiration is the process of
 - breaking down food to release energy
 - making food using light
 - transporting water
 - fixing nitrogen
- Aerobic respiration requires
 - oxygen
 - nitrogen
 - carbon dioxide only
 - hydrogen
- The overall equation of aerobic respiration produces
 - CO_2 , H_2O and energy
 - glucose and O_2
 - ATP only
 - lactic acid only
- Respiration in plants differs from photosynthesis in that it
 - releases energy
 - stores energy
 - needs light
 - produces oxygen

1 Mark Questions

- Define cellular respiration.
- Which gas is used in aerobic respiration?
- Name the site of aerobic respiration in the cell.

2 Mark Questions

- Distinguish between aerobic and anaerobic respiration.
- State the overall equation of aerobic respiration.

3 Mark Questions

- Describe the overview of cellular respiration.
- Explain how respiration in plants differs from photosynthesis.

Glycolysis (EMP Pathway)

MCQ Questions (choose the correct option)

1. Glycolysis occurs in the
 - (A) cytoplasm
 - (B) mitochondria
 - (C) chloroplast
 - (D) nucleus
2. Glycolysis converts one glucose into
 - (A) two pyruvate
 - (B) one pyruvate
 - (C) four pyruvate
 - (D) two acetyl-CoA
3. The net ATP yield of glycolysis is
 - (A) 2 ATP
 - (B) 4 ATP
 - (C) 6 ATP
 - (D) 0 ATP
4. The end product of glycolysis is
 - (A) pyruvic acid
 - (B) lactic acid
 - (C) ethanol
 - (D) citric acid

1 Mark Questions

1. Where does glycolysis occur?
2. What is the end product of glycolysis?
3. What is the net ATP yield of glycolysis?

2 Mark Questions

1. State two features of glycolysis.
2. Why is glycolysis called the EMP pathway?

3 Mark Questions

1. Describe the steps of glycolysis.
2. Explain the fate of pyruvate after glycolysis.

Fermentation

MCQ Questions (choose the correct option)

1. Fermentation is a form of
 - (A) anaerobic respiration
 - (B) aerobic respiration
 - (C) photosynthesis
 - (D) photorespiration
2. In alcoholic fermentation, pyruvate is converted into

- (A) ethanol and CO₂
 - (B) lactic acid
 - (C) citric acid
 - (D) acetyl-CoA
3. In lactic acid fermentation, pyruvate is converted into
- (A) lactic acid
 - (B) ethanol
 - (C) CO₂
 - (D) citric acid
4. The net ATP yield of fermentation per glucose is
- (A) 2 ATP
 - (B) 36 ATP
 - (C) 38 ATP
 - (D) 0 ATP

1 Mark Questions

1. What is fermentation?
2. Name the product of alcoholic fermentation.
3. Name the product of lactic acid fermentation.

2 Mark Questions

1. Distinguish between alcoholic and lactic acid fermentation.
2. Why is the energy yield of fermentation low?

3 Mark Questions

1. Describe fermentation with examples.
2. Compare fermentation and aerobic respiration.

Link Reaction and Krebs Cycle (TCA Cycle)

MCQ Questions (choose the correct option)

1. The Krebs cycle occurs in the
 - (A) mitochondrial matrix
 - (B) cytoplasm
 - (C) chloroplast
 - (D) thylakoid
2. Pyruvate is converted to acetyl-CoA by
 - (A) oxidative decarboxylation
 - (B) photolysis
 - (C) glycolysis
 - (D) fermentation
3. The enzyme that forms citrate in the Krebs cycle is
 - (A) citrate synthase
 - (B) RuBisCO
 - (C) hexokinase

(D) ATP synthase

4. The number of CO₂ molecules released per turn of the Krebs cycle is

(A) 2

(B) 1

(C) 3

(D) 4

1 Mark Questions

1. Where does the Krebs cycle occur?
2. What is the first product of the Krebs cycle?
3. How many CO₂ molecules are released per turn?

2 Mark Questions

1. What is the link reaction?
2. State two products of the Krebs cycle.

3 Mark Questions

1. Describe the link reaction and Krebs cycle.
2. Explain the significance of the Krebs cycle.

Electron Transport System and Oxidative Phosphorylation

MCQ Questions (choose the correct option)

1. The electron transport system is located in the
 - (A) inner mitochondrial membrane
 - (B) cytoplasm
 - (C) matrix
 - (D) chloroplast
2. The final electron acceptor in the ETS is
 - (A) oxygen
 - (B) NAD⁺
 - (C) FAD
 - (D) CO₂
3. ATP synthesis using the proton gradient is called
 - (A) oxidative phosphorylation
 - (B) photophosphorylation
 - (C) glycolysis
 - (D) decarboxylation
4. The enzyme that synthesises ATP in the ETS is
 - (A) ATP synthase
 - (B) RuBisCO
 - (C) citrate synthase
 - (D) hexokinase

1 Mark Questions

1. Where is the electron transport system located?
2. What is the final electron acceptor?
3. What is oxidative phosphorylation?

2 Mark Questions

1. State the role of oxygen in the ETS.
2. What is the chemiosmotic hypothesis?

3 Mark Questions

1. Describe the electron transport system.
2. Explain oxidative phosphorylation and the role of ATP synthase.

Respiratory Balance Sheet

MCQ Questions (choose the correct option)

1. The total ATP yield from one glucose molecule in aerobic respiration is often given as
 - (A) 38 ATP
 - (B) 2 ATP
 - (C) 18 ATP
 - (D) 76 ATP
2. NADH yields approximately
 - (A) 3 ATP
 - (B) 2 ATP
 - (C) 1 ATP
 - (D) 0 ATP
3. FADH₂ yields approximately
 - (A) 2 ATP
 - (B) 3 ATP
 - (C) 1 ATP
 - (D) 4 ATP
4. The ATP produced directly in glycolysis and the Krebs cycle is called
 - (A) substrate-level phosphorylation
 - (B) oxidative phosphorylation
 - (C) photophosphorylation
 - (D) decarboxylation

1 Mark Questions

1. How many ATP are produced per NADH?
2. How many ATP are produced per FADH₂?
3. What is substrate-level phosphorylation?

2 Mark Questions

1. State the ATP yield of aerobic respiration.
2. Distinguish between substrate-level and oxidative phosphorylation.

3 Mark Questions

1. Prepare a balance sheet of aerobic respiration.
2. Account for the ATP produced in each step of respiration.

Respiratory Quotient (RQ)

MCQ Questions (choose the correct option)

1. The respiratory quotient is the ratio of
 - (A) CO₂ released to O₂ consumed
 - (B) O₂ released to CO₂ consumed
 - (C) ATP to glucose
 - (D) glucose to ATP
2. The RQ for carbohydrates is
 - (A) 1.0
 - (B) 0.7
 - (C) 0.9
 - (D) 4.0
3. The RQ for fats is
 - (A) about 0.7
 - (B) about 1.0
 - (C) about 0.9
 - (D) about 1.3
4. The RQ for organic acids is
 - (A) more than 1
 - (B) less than 1
 - (C) equal to 1
 - (D) zero

1 Mark Questions

1. What is the respiratory quotient?
2. What is the RQ for carbohydrates?
3. What is the RQ for fats?

2 Mark Questions

1. How is RQ calculated?
2. Why is the RQ of organic acids more than 1?

3 Mark Questions

1. Explain the respiratory quotient with examples.
2. Describe how RQ varies with the respiratory substrate.