

Respiration in Plants — CBSE Pattern Test 1

Class 11 Biology · 90 minutes · 40 marks · Sections A–D with answer key · Narayan Gurukul Academy

Test 1 — CBSE Pattern (90 minutes, 40 marks)

Class 11 Biology · Respiration in Plants · Narayan Gurukul Academy (ClassApna)

General Instructions: (1) This paper has four sections — Section A (1×10), Section B (2×4), Section C (3×4) and Section D (5×2) — total 40 marks. Time allowed: 90 minutes.

(2) All questions are compulsory. No overall choice is given; internal choice, where allowed, is clearly marked.

(3) For MCQ questions choose the single correct option; for VSA answers write a single line.

(4) Take $g = 10 \text{ m/s}^2$. All symbols carry their usual meaning. Use of a calculator is not permitted.

Section A — MCQ & VSA ($10 \times 1 = 10$ marks)

- 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
- Glycolysis occurs in the
 - cytoplasm
 - mitochondria
 - chloroplast
 - nucleus
- Glycolysis converts one glucose into
 - two pyruvate
 - one pyruvate
 - four pyruvate
 - two acetyl-CoA
- The net ATP yield of glycolysis is
 - 2 ATP
 - 4 ATP
 - 6 ATP
 - 0 ATP
- The Krebs cycle occurs in the
 - mitochondrial matrix
 - cytoplasm
 - chloroplast
 - thylakoid
- The final electron acceptor in the ETS is
 - oxygen

- (B) NAD^+
 - (C) FAD
 - (D) CO_2
8. The respiratory quotient for carbohydrates is
- (A) 1.0
 - (B) 0.7
 - (C) 0.9
 - (D) 4.0
9. Define cellular respiration.
10. What is the end product of glycolysis?

Section B — Short Answer I ($4 \times 2 = 8$ marks)

11. Which gas is used in aerobic respiration?
12. What is the end product of glycolysis?
13. Name the product of alcoholic fermentation.
14. What is the respiratory quotient?

Section C — Short Answer II ($4 \times 3 = 12$ marks)

15. Distinguish between aerobic and anaerobic respiration.
16. Distinguish between alcoholic and lactic acid fermentation.
17. What is the link reaction?
18. State two products of the Krebs cycle.

Section D — Long Answers ($2 \times 5 = 10$ marks)

19. (a) Describe the steps of glycolysis. (b) Describe the link reaction and Krebs cycle.
20. (a) Describe the electron transport system. (b) Prepare a balance sheet of aerobic respiration.

Answer Key (Marking Scheme)

- Q1 — (A) breaking down food to release energy. Q2 — (A) oxygen. Q3 — (A) cytoplasm. Q4 — (A) two pyruvate. Q5 — (A) 2 ATP. Q6 — (A) mitochondrial matrix. Q7 — (A) oxygen. Q8 — (A) 1.0.
- Q9 — Cellular respiration is the stepwise oxidation of food to release energy as ATP.
- Q10 — Pyruvic acid (pyruvate).
- Q11 — Oxygen.
- Q12 — Pyruvic acid (pyruvate).
- Q13 — Ethanol (and CO_2).
- Q14 — The ratio of CO_2 released to O_2 consumed.
- Q15 — Aerobic uses oxygen and completely oxidises glucose (~38 ATP); anaerobic does not use oxygen and partially oxidises it (2 ATP).
- Q16 — Alcoholic fermentation gives ethanol and CO_2 (yeast); lactic acid fermentation gives lactic acid (muscle).
- Q17 — The oxidative decarboxylation of pyruvate to acetyl-CoA.
- Q18 — NADH and FADH_2 (and CO_2/ATP).

Q19 — (a) Glucose is phosphorylated, split into two triose phosphates and oxidised to two pyruvate with net 2 ATP + 2 NADH. (b) Pyruvate → acetyl-CoA; acetyl-CoA condenses with OAA to give citrate; the cycle releases 2 CO₂, 3 NADH, 1 FADH₂ and 1 ATP.

Q20 — (a) NADH/FADH₂ donate electrons to the ETS in the inner mitochondrial membrane; O₂ is the final acceptor and ATP is made by chemiosmosis. (b) Glycolysis 2 ATP + 2 NADH; link 2 NADH; Krebs 2 ATP + 6 NADH + 2 FADH₂ → about 38 ATP.