

Breathing and Exchange of Gases — 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 · Breathing and Exchange of Gases · 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)

- The primary site of gas exchange in the human body is the
 - alveoli
 - trachea
 - bronchi
 - larynx
- The muscular sheet separating the thoracic and abdominal cavities is the
 - diaphragm
 - pleura
 - epiglottis
 - larynx
- Inspiration occurs when the diaphragm
 - contracts and flattens
 - relaxes and domes up
 - stays still
 - expands the abdomen
- The volume of air inspired or expired during a normal breath is the
 - tidal volume
 - vital capacity
 - residual volume
 - total lung capacity
- Exchange of gases between alveoli and blood occurs by
 - simple diffusion
 - active transport
 - osmosis
 - endocytosis
- Most oxygen is transported in the blood by
 - haemoglobin
 - plasma
 - platelets
 - white blood cells
- Most carbon dioxide is transported as
 - bicarbonate ions

- (B) carbamino-haemoglobin
 - (C) free CO₂ in plasma
 - (D) carbonic acid only
8. The respiratory centre is located in the
- (A) medulla oblongata
 - (B) cerebellum
 - (C) hypothalamus
 - (D) spinal cord only
9. Name the primary site of gas exchange in the lungs.
10. What is tidal volume?

Section B — Short Answer I (4 × 2 = 8 marks)

11. What is the diaphragm?
12. What is inspiration?
13. What is residual volume?
14. In which form is most CO₂ transported?

Section C — Short Answer II (4 × 3 = 12 marks)

15. Distinguish between inspiration and expiration.
16. Distinguish between tidal volume and vital capacity.
17. State two forms in which CO₂ is transported.
18. How is breathing regulated by CO₂?

Section D — Long Answers (2 × 5 = 10 marks)

19. (a) Describe the structure of the human respiratory system. (b) Describe the mechanism of breathing.
20. (a) Describe the transport of oxygen in the blood. (b) Explain the regulation of breathing.

Answer Key (Marking Scheme)

- Q1 — (A) alveoli. Q2 — (A) diaphragm. Q3 — (A) contracts and flattens. Q4 — (A) tidal volume. Q5 — (A) simple diffusion. Q6 — (A) haemoglobin. Q7 — (A) bicarbonate ions. Q8 — (A) medulla oblongata.
- Q9 — The alveoli.
- Q10 — Tidal volume is the air inspired or expired during a normal breath (~500 mL).
- Q11 — The diaphragm is the muscular sheet separating the thoracic and abdominal cavities.
- Q12 — Inspiration is the intake of air into the lungs.
- Q13 — Residual volume is the air remaining in the lungs after a forced expiration.
- Q14 — As bicarbonate ions.
- Q15 — Inspiration: air enters (diaphragm contracts); expiration: air leaves (diaphragm relaxes).
- Q16 — Tidal volume is air in a normal breath; vital capacity is the maximum air expired after maximum inspiration.
- Q17 — As bicarbonate ions and as carbamino-haemoglobin.
- Q18 — Rising CO₂ stimulates the respiratory centre in the medulla, increasing the breathing rate.

Q19 — (a) Nostrils → nasal cavity → pharynx → larynx → trachea → bronchi → bronchioles → alveoli. (b) Inspiration: diaphragm contracts and ribs move up/out; expiration: diaphragm relaxes and ribs move down/in.

Q20 — (a) About 97% as oxyhaemoglobin, 3% dissolved in plasma. (b) The medullary respiratory centre responds to CO₂/H⁺ levels.