NEET-UG Biology MCQ Practice Series

📘 *Chapter 14: Breathing & Exchange of gases*

(50 Most Important MCQs with Answer Key & Explanations)

DO NOT C

Prepared by: ***Study with Shelja (SWS)***

For: NEET-UG 2026 Aspirants

Chapter 14 – Breathing & Exchange of gases (NEET MCQs – 50 Questions)

❖ Respiratory Organs

1. Respiration through moist skin is seen in:
(a) Fish
(b) Frog
(c) Cockroach
(d) Birds

2. Insects respire through:
(a) Gills
(b) Lungs
(c) Tracheal system
(d) Skin

3. Among vertebrates, lungs are absent in:
(a) Amphibians
(b) Fishes
(c) Reptiles
(d) Mammals

4. Cutaneous respiration in vertebrates occurs in:
(a) Frog
(b) Human
(c) Bird
(d) Lizard

5. Alveoli are found in:
(a) Earthworm
(b) Mammals
(c) Insects
(d) Fish

❖ Mechanism of Breathing

6. Inspiration occurs when:
(a) Intra-pulmonary pressure > Atmospheric pressure
(b) Intra-pulmonary pressure < Atmospheric pressure
(c) Thoracic volume decreases
(d) Diaphragm relaxes

7. Expiration occurs when:
(a) Thoracic cavity expands
(b) Pulmonary pressure < Atmospheric pressure
(c) Pulmonary pressure > Atmospheric pressure
(d) Diaphragm contracts

DO NOT COPY (SWS)

8. Which muscles help in forced expiration?
(a) External intercostals
(b) Internal intercostals and abdominal muscles
(c) Diaphragm only
(d) Sternocleidomastoid

9. Spirometer is used to measure:
(a) Blood circulation
(b) Breathing rate
(c) Respiratory volumes and capacities
(d) Heart rate

10. Normal breathing rate in a healthy human is:
(a) 6–8/min
(b) 12–16/min
(c) 20–24/min
(d) 30/min

❖ **Respiratory Volumes and Capacities**

11. Tidal volume in an average adult is about:
(a) 150 mL
(b) 500 mL
(c) 1000 mL
(d) 3000 mL

12. Volume of air forcibly inspired after normal inspiration is:
(a) ERV
(b) IRV
(c) RV
(d) TV

13. Vital capacity is equal to:
(a) TV + IRV
(b) TV + IRV + ERV
(c) IRV + ERV
(d) ERV + RV

14. Functional residual capacity (FRC) =
(a) ERV + RV
(b) IRV + ERV
(c) TV + IRV
(d) TV + ERV

15. Total lung capacity (TLC) =
(a) VC + RV
(b) IRV + ERV + TV

DO NOT COPY (SWS)

(c) VC – RV
(d) TV + ERV

❖ **Exchange of Gases**

16. Gas exchange in humans occurs at:
(a) Bronchi
(b) Alveoli
(c) Trachea
(d) Bronchioles

17. Thickness of alveolar diffusion membrane is about:
(a) 1 mm
(b) 0.5 mm
(c) <1 μm
(d) <1 mm

18. Which factor does NOT affect gas diffusion across alveoli?
(a) Partial pressure gradient
(b) Solubility of gases
(c) Membrane thickness
(d) Active transport

19. pO_2 in alveoli is approximately:
(a) 40 mm Hg
(b) 104 mm Hg
(c) 95 mm Hg
(d) 159 mm Hg

20. Solubility of CO_2 in blood is about how many times greater than O_2?
(a) 2
(b) 5
(c) 20–25
(d) 50

❖ **Transport of Gases**

21. Percentage of oxygen carried by hemoglobin in blood is:
(a) 97%
(b) 70%
(c) 50%
(d) 3%

22. Oxygen dissociation curve is:
(a) Linear
(b) Sigmoid

DO NOT COPY (SWS)

(c) Hyperbolic
(d) Exponential

23. Conditions in tissues favoring O_2 release from hemoglobin include:
(a) High pO_2 and low pCO_2
(b) Low pO_2, high pCO_2, high H^+
(c) Low pCO_2, low H^+
(d) Low temperature

24. Each hemoglobin molecule binds maximally with:
(a) 2 O_2 molecules
(b) 3 O_2 molecules
(c) 4 O_2 molecules
(d) 6 O_2 molecules

25. Every 100 mL of oxygenated blood delivers about:
(a) 1 mL O_2
(b) 3 mL O_2
(c) 5 mL O_2
(d) 10 mL O_2

26. Maximum CO_2 transport occurs as:
(a) Carbaminohemoglobin
(b) Bicarbonate ions
(c) Dissolved CO_2
(d) Free CO_2

27. Carbonic anhydrase is found mainly in:
(a) Plasma
(b) RBCs
(c) Alveoli
(d) Bronchioles

28. Carbaminohemoglobin formation is favored in:
(a) High pCO_2, low pO_2 (tissues)
(b) Low pCO_2, high pO_2 (alveoli)
(c) High pO_2, high pCO_2
(d) Low pCO_2, low pO_2

29. Every 100 mL of deoxygenated blood delivers about:
(a) 2 mL CO_2
(b) 4 mL CO_2
(c) 6 mL CO_2
(d) 10 mL CO_2

30. The enzyme carbonic anhydrase catalyzes:
(a) $CO_2 \rightarrow O_2$
(b) $CO_2 + H_2O \leftrightarrow H_2CO_3$

DO NOT COPY (SWS)

(c) $H_2O \rightarrow H^+ + OH^-$
(d) $O_2 \rightarrow CO_2$

❖ Regulation of Respiration

31. Respiratory rhythm center is located in:
(a) Pons
(b) Medulla oblongata
(c) Cerebrum
(d) Hypothalamus

32. Pneumotaxic center is present in:
(a) Pons
(b) Medulla
(c) Cerebellum
(d) Midbrain

33. Which is most important in regulating respiration?
(a) pO_2
(b) pCO_2 and H^+
(c) Blood pressure
(d) ATP levels

34. Receptors detecting changes in pCO_2 are present in:
(a) Aortic arch and carotid artery
(b) Kidney
(c) Liver
(d) Stomach

35. Oxygen plays:
(a) Major role in regulation
(b) Minor role in regulation
(c) Equal role with CO_2
(d) No role at all

❖ Disorders of Respiratory System

36. Asthma is caused by:
(a) Inflammation of bronchioles
(b) Rupture of alveoli
(c) Fibrosis of lungs
(d) Lack of surfactant

37. Emphysema is due to:
(a) Inflammation of bronchi
(b) Damage of alveolar walls

DO NOT COPY (SWS)

(c) Lung fibrosis due to dust
(d) Infection by bacteria

38. Long exposure to stone dust causes:
(a) Asthma
(b) Silicosis
(c) Emphysema
(d) Tuberculosis

39. Occupational respiratory disorders mainly cause:
(a) Increase in lung capacity
(b) Inflammation and fibrosis
(c) Extra alveoli formation
(d) High O_2 absorption

40. Which of the following is NOT a respiratory disorder?
(a) Asthma
(b) Emphysema
(c) Silicosis
(d) Arthritis

❖ **Mixed / Applied NEET-type Questions**

41. Minute volume in a healthy adult is approximately:
(a) 1 L/min
(b) 3 L/min
(c) 6–8 L/min
(d) 12 L/min

42. The sound box in humans is:
(a) Pharynx
(b) Larynx
(c) Trachea
(d) Epiglottis

43. Pleural fluid is important for:
(a) Gas exchange
(b) Reducing friction
(c) Secreting mucus
(d) O_2 binding

44. Hypoxia refers to:
(a) Excess O_2 at tissues
(b) O_2 deficiency at tissues
(c) CO_2 deficiency
(d) Increased pO_2

DO NOT COPY (SWS)

45. At high altitude, the most common problem is:
(a) Silicosis
(b) Hypoxia
(c) Asthma
(d) Emphysema

46. Which part is the common passage for both food and air?
(a) Larynx
(b) Pharynx
(c) Trachea
(d) Bronchus

47. Which respiratory volume ensures lungs never collapse?
(a) TV
(b) RV
(c) ERV
(d) IRV

48. Which condition shifts O_2 dissociation curve to right?
(a) High pH
(b) High temperature & high pCO_2
(c) Low H^+ concentration
(d) Low CO_2

49. Surfactant in alveoli mainly:
(a) Increases surface tension
(b) Reduces surface tension
(c) Helps diffusion
(d) Acts as enzyme

50. Which is NOT a step of respiration?
(a) Inspiration
(b) Gas exchange
(c) Cellular respiration
(d) Photosynthesis

DO NOT COPY (SWS)

ANSWER KEY

1-b	**11-b**	**21-a**	**31-b**	**41-c**
2-c	**12-b**	**22-b**	**32-a**	**42-b**
3-b	**13-b**	**23-b**	**33-b**	**43-b**
4-a	**14-a**	**24-c**	**34-a**	**44-b**
5-b	**15-a**	**25-c**	**35-b**	**45-b**
6-b	**16-b**	**26-b**	**36-a**	**46-b**

7-c	**17-d**	**27-b**	**37-b**	**47-b**
8-b	**18-d**	**28-a**	**38-b**	**48-b**
9-c	**19-b**	**29-b**	**39-b**	**49-b**
10-b	**20-c**	**30-b**	**40-d**	**50-d**

EXPLANATIONS

❖ Respiratory Organs

- **Q3.** Among vertebrates, only **fishes lack lungs**, they respire through gills. Amphibians, reptiles, birds, and mammals have lungs.
- **Q4.** Frogs can respire through moist skin (cutaneous respiration) besides lungs.

❖ Mechanism of Breathing

- **Q6–7.** Inspiration occurs when **intra-pulmonary pressure < atmospheric pressure** due to diaphragm contraction & rib lifting. Expiration occurs when the reverse happens.
- **Q8. Forced expiration** uses internal intercostals + abdominal muscles, not diaphragm alone.

❖ Respiratory Volumes & Capacities

- **Q13.** Vital capacity = IRV + TV + ERV. Important for clinical assessment of lung health.
- **Q14.** FRC = ERV + RV → ensures some air always remains in lungs after normal expiration.

❖ Exchange of Gases

- **Q17.** Diffusion membrane (alveolar epithelium + capillary endothelium + basement membranes) is **<1 mm thick**, facilitating diffusion.
- **Q18.** Gas exchange depends only on passive diffusion; **active transport does not occur**.
- **Q20.** CO_2 is ~20–25× more soluble than O_2 → hence small pressure gradients can drive CO_2 exchange efficiently.

❖ Transport of Gases

- **Q22.** Oxygen dissociation curve is **sigmoid (S-shaped)** due to cooperative binding of O_2 with hemoglobin.
- **Q23.** In tissues: low pO_2, high pCO_2, high H^+ concentration & temperature → favor O_2 release (Bohr's effect).
- **Q26.** Majority (~70%) of CO_2 is carried as **bicarbonate ions**, not carbaminohemoglobin.
- **Q28.** At tissue level (high CO_2, low O_2), carbaminohemoglobin formation is favored.
- **Q29.** Every 100 mL deoxygenated blood delivers ~4 mL CO_2 at alveoli.

DO NOT COPY (SWS)

❖ Regulation of Respiration

- **Q33.** Regulation depends mainly on **pCO_2 & H^+**, oxygen plays a **minor role**.
- **Q34.** Chemoreceptors in **aortic arch & carotid body** detect changes in CO_2/H^+ and send signals to medulla.

❖ Disorders of Respiratory System

- **Q37.** Emphysema = alveolar wall damage → reduced surface area (common in smokers).
- **Q38.** Silicosis = occupational lung fibrosis due to stone dust.

❖ Mixed/Applied

- **Q41.** Minute volume = TV × breathing rate ≈ 500 mL × 12–16 = 6–8 L/min.
- **Q44–45.** Hypoxia = oxygen deficiency at tissue level; common at **high altitude** due to low pO_2.
- **Q47.** RV (Residual Volume) prevents lungs from collapsing even after forced expiration.
- **Q48.** High temperature, high CO_2, high H^+ shift O_2 curve right → more O_2 released in tissues.
- **Q49.** Surfactant reduces surface tension of alveoli, preventing collapse.

DO NOT COPY (SWS)