CLASS XI BIO CH-14

Set 4 – Conceptual / NEET-Style (Advanced)

- 1. The lungs remain expanded even after maximum expiration because of
- A) Residual volume
- B) Vital capacity
- C) Functional residual capacity
- D) Inspiratory reserve volume
- 2. Which of the following directly controls rate and depth of breathing?
- A) Chemoreceptors in aortic arch and carotid bodies
- B) Stretch receptors in skin
- C) Proprioceptors in muscles
- D) Baroreceptors in arteries
- **3.** If partial pressure of oxygen in alveoli drops from 104 mm Hg to 60 mm Hg, diffusion of O₂ into blood will
- A) Stop completely
- B) Slow down
- C) Speed up
- D) Remain unaffected
- 4. A patient's spirometer reading shows a normal TV but very low VC. This indicates
- A) Damage to alveoli
- B) Weak respiratory muscles
- C) Blocked trachea
- D) High haemoglobin level
- **5.** During inspiration, the external intercostal muscles:
- A) Relax
- B) Contract and lift ribs outward
- C) Contract and push ribs inward
- D) Remain inactive
- 6. Sudden exposure to high altitude leads to breathlessness because
- A) Low pO2 causes reduced oxygenation of blood
- B) Low CO₂ reduces chemoreceptor activity
- C) Air density increases
- D) Lungs collapse
- 7. If a person breathes rapidly and deeply for several minutes, blood pH will
- A) Decrease
- B) Increase
- C) Remain same
- D) Drop sharply after few seconds
- 8. The primary stimulus for breathing in a normal person is
- A) Low O₂ concentration
- B) High CO₂ concentration

- C) High N₂ concentration
- D) Low blood pressure
- 9. A person's alveolar membrane becomes thick due to fibrosis. What is expected?
- A) Increased diffusion rate
- B) Decreased diffusion rate
- C) No change
- D) Reversal of gas flow
- 10. At the tissue level, most CO2 enters RBCs because
- A) Carbonic anhydrase is abundant inside RBCs
- B) RBCs have higher pH
- C) Plasma is impermeable
- D) RBCs lack mitochondria
- **11.** The Bohr effect facilitates O₂ transport by
- A) Increasing O2 binding at tissues
- B) Enhancing O2 release at tissues
- C) Preventing CO₂ binding
- D) Increasing CO₂ uptake
- 12. When pCO2 increases in blood, breathing becomes
- A) Slower and shallow
- B) Faster and deeper
- C) Irregular but slower
- D) Absent
- 13. The Haldane effect refers to
- A) Effect of O₂ on CO₂ transport
- B) Effect of CO₂ on O₂ binding
- C) pH change on O₂ transport
- D) Effect of temperature on Hb saturation
- 14. Why is partial pressure of O₂ in alveoli less than that in atmosphere?
- A) Mixing of residual air and humidification
- B) Active O₂ uptake by alveoli
- C) Low blood flow
- D) CO₂ secretion into alveoli
- 15. The steepness of O₂ diffusion gradient between alveoli and blood depends on
- A) Ventilation rate only
- B) Blood flow and ventilation
- C) pH of blood
- D) Carbonic anhydrase activity
- **16.** Which of the following changes occurs during exercise?
- A) Right shift of O₂ dissociation curve
- B) Left shift of O₂ dissociation curve
- C) Decrease in CO₂ production
- D) Decrease in temperature
- 17. A person holds breath for long; what change occurs first?
- A) Rise in blood CO₂

B) Fall in blood O2 C) Drop in Hb D) Decrease in blood pressure 18. Hyperventilation leads to A) Decrease in blood CO2 and alkalosis B) Increase in CO₂ and acidosis C) Increase in H⁺ D) None 19. The maximum amount of O2 carried by 100 mL of blood is about A) 10 mL B) 20 mL C) 5 mL D) 15 mL 20. In alveoli, CO2 is released from bicarbonate primarily due to A) Low pCO₂ B) Action of carbonic anhydrase C) High H⁺ concentration D) Enzyme absence 21. The medulla's respiratory rhythm centre responds mainly to A) pO₂ B) pCO₂ and H⁺ C) Temperature D) Blood pressure 22. Which combination favors loading of O₂ on Hb? A) High pO₂, low pCO₂, low H⁺, low temperature B) Low pO₂, high pCO₂ C) High H⁺, high temperature D) Low pO₂, low H⁺ 23. The oxygen-haemoglobin dissociation curve becomes flat at high pO₂ because A) Hb is almost saturated B) Hb affinity decreases C) Hb breaks down

24. The respiratory surface of humans is efficient because

A) Large area and thin membrane

B) Atmospheric > IntrapulmonaryC) Thoracic cavity expands

25. During expiration, air moves out because

A) Intrapulmonary pressure > Atmospheric pressure

C) Thick and vascular walls D) High alveolar pressure

D) None

D) None

B) Dry surface

- 26. O2 transport efficiency of blood depends mainly on
- A) Haemoglobin concentration
- B) Plasma volume
- C) Temperature
- D) CO₂ concentration
- 27. Which statement about CO2 transport is incorrect?
- A) 70 % as bicarbonate
- B) 23 % as carbamino compound
- C) 7 % dissolved
- D) 50 % by plasma proteins
- 28. The first step in inspiration is
- A) Contraction of diaphragm
- B) Relaxation of intercostal muscles
- C) Closure of glottis
- D) None
- 29. The sigmoidal shape of O2-Hb curve is due to
- A) Cooperative binding of O₂ to Hb
- B) Independent binding
- C) CO₂ interference
- D) Linear diffusion
- 30. The affinity of Hb for O2 decreases with
- A) Low pH and high temperature
- B) High pH and low temperature
- C) Low CO₂
- D) Low H⁺
- 31. At the tissue level, which form of CO₂ transport predominates?
- A) Dissolved gas
- B) Carbamino compound
- C) Bicarbonate ion
- D) Carbonic acid
- 32. When CO2 is added to blood, pH
- A) Decreases
- B) Increases
- C) Unchanged
- D) Rises briefly
- 33. CO₂ produced in mitochondria diffuses out of cells because
- A) pCO₂ in cells > pCO₂ in blood
- B) Active transport
- C) ATP consumption
- D) High O₂ in blood
- 34. Breathing stops if
- A) Medulla is damaged
- B) Cerebellum is damaged
- C) Spinal cord is damaged below neck
- D) Both A and C

35. The vital capacity is reduced in
A) Emphysema
B) Asthma
C) Both A and B
D) None
36. During sleep, breathing rate de
A > D

- ecreases due to
- A) Reduced metabolic activity
- B) High pCO₂
- C) Increased neural stimulation
- D) Low H⁺
- 37. If atmospheric pressure falls by half, the oxygen diffusion into blood will
- A) Reduce by half
- B) Increase
- C) Stop
- D) Remain constant
- 38. The functional residual capacity helps to
- A) Maintain uniform alveolar gas concentration
- B) Empty lungs completely
- C) Increase tidal volume
- D) Reduce blood flow
- 39. Pulmonary surfactant prevents
- A) Alveolar collapse
- B) Oxygen diffusion
- C) CO₂ dissolution
- D) Lung elasticity
- 40. Which change occurs in blood leaving the lungs?
- A) pO₂ increases, pCO₂ decreases
- B) pO₂ decreases, pCO₂ increases
- C) Both decrease
- D) Both increase
- 41. The diffusion membrane does NOT include
- A) Alveolar epithelium
- B) Capillary endothelium
- C) Smooth muscle layer
- D) Basement membrane
- **42.** Which factor increases the breathing rate?
- A) High H⁺ and pCO₂
- B) Low CO₂
- C) High pH
- D) High O₂
- 43. Occupational lung disease can cause
- A) Fibrosis reducing diffusion area
- B) Alveolar enlargement
- C) Oedema
- D) Bronchial dilation

B) Carbamino compound
C) Carbonate
D) None
45. The enzyme carbonic anhydrase is inactive in
A) Plasma
B) RBCs
C) Alveoli
D) Tissues
46. High CO₂ in blood is called
A) Hypercapnia
B) Hypocapnia
C) Hyperoxia
D) Hypoxia
47. Which statement about emphysema is correct?
A) Alveolar walls rupture → less surface area
B) Lung elasticity increases
C) pO ₂ rises
D) Diffusion distance decreases
48. Asthma causes breathing difficulty because
A) Inflammation narrows bronchioles
B) Loss of surfactant
C) Alveolar collapse
D) Thick diffusion membrane
49. Which pair is correctly matched?
A) Medulla – Rhythm centre
B) Pons – Pneumotaxic centre C) Both A and B
D) None
B) Notice
50. The respiratory process continues even during sleep due to
A) Involuntary control by medulla
B) Voluntary control
C) Stimulation by cerebrum
D) Chemical inhibition

44. The first step in CO_2 transport from tissues is its conversion to

A) Carbonic acid

Answer Key (Set 4)

1-A, 2-A, 3-B, 4-B, 5-B, 6-A, 7-B, 8-B, 9-B, 10-A, 11-B, 12-B, 13-A, 14-A, 15-B, 16-A, 17-A, 18-A, 19-B, 20-B, 21-B, 22-A, 23-A, 24-A, 25-A, 26-A, 27-D, 28-A, 29-A, 30-A, 31-C, 32-A, 33-A, 34-D, 35-C, 36-A, 37-A, 38-A, 39-A, 40-A, 41-C, 42-A, 43-A, 44-A, 45-A, 46-A, 47-A, 48-A, 49-C, 50-A.