BREATHING & EXCHANGE OF GASES

1. Volume of thoracic cavity decreases dorsoventrally due to the

a. Relaxation of muscles of diaphragm b. Relaxation of external inters costal muscles

c. Contraction of muscles of diaphragm d. Contraction of external inter costal muscles

2. 75% of hemoglobin is saturated when the PO_2 is

a. 30mm Hg b. 95 mm Hg c. 98 mm Hg 4. 40 mm Hg

3. The largest cartilage in larynx forms

a. Dorsal and ventral walls b. Dorsal and lateral walls

c Ventral wall only d. Ventral and lateral walls

4. During pulmonary gas exchange O_2 from alveolar air diffuses into blood under the difference of PO_2 is

a. 5 mm Hg b. 55 mm Hg c. 64 mm Hg d. 22 mm Hg

5. Assertion (A): Humans can't survive long at an altitude above 6000 meters although the air at that altitude contains 20.95% O_2

Reason (R): At an altitude above 6000 meters the PO_2 is very low

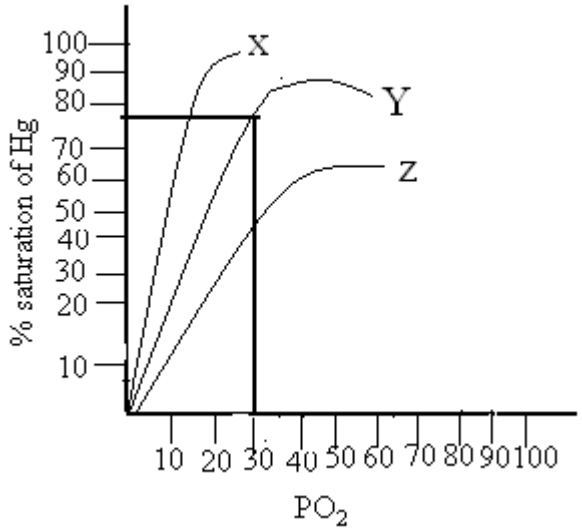
a. A and R are correct and R is the correct explanation of A

b. A and R are correct and R is not the correct explanation of A

c. A is true R is false

d. A is false R is true

6. In the oxygen hemoglobin dissociation curves given below, conditions applicable to the curve X are (comparatively)



a. Higher temperature, high CO_2, low pH
b. Low temperature, low CO_2, high pH
c. Low temperature, high CO_2, high pH
d. High temperature. Low CO_2, low pH

7. % of CO_2 transported as carbamino compounds is

a. 70%
b. 7%
c. 23 %
d. 95%

8. Find the correct statement related to reverse chloride shift

a. HCO_3-diffuses into RBC and Cl- into plasma - at lungs

b. HCO_3-diffuses into RBC and Cl- into plasma - at tissues

c. HCO_3- diffuses into plasma and Cl- into RBC-at lungs

d. HCO_3- diffuses into plasma and Cl- into RBC-at tissues

9. The epiglottis arises from

a. Cricoid cartilage
b. Arytenoids
c. Thyroid cartilage
d. Santorini

10. Alveolus is lined by

a. Simple squamous epithelium
b. Columnar epithelium
c. Pseudostratified ciliated epithelium
d. Simple cuboidal epithelium

11. The two fibro-elastic strands of the larynx extend between the

a. Thyroid and arytenoid cartilages
b. Thyroid and criciod cartilages
c. Santorini and thyroid cartilages
d. Cricoid and tracheal cartilaginous rings

12. Rima glottidis in rabbit is a space between the

a. Vocal cards b. Arytenoids and santorini

c. Cricoids and arytenoids d. Glottis and epiglottis

13. Entry of the maximum amount of air into the lungs during normal breathing is due to the contraction of

a. External inter costal muscles b. Internal inter costal muscles

c. Diaphragm d. External and internal inter costal muscles

14. Maximum volume of air that can be exhaled after taking the deepest breath possible is called

a. Vital capacity b. Total lung capacity

c. Inspiratory capacity d. Functional Residual capacity

15. Formula for Functional Residual Capacity is

a. TV+IRV b. ERV+RV c. VC+RV d. TV+IRV+ERV

16. The following are the statements regarding respiration

I. Cellular respiration involves the production of ATP

II. Inspiration is an active process caused due to contraction of external inter costal muscles

III. Forceful expiration is caused due to contraction of internal intercostal muscles.

The **correct** combination is

a. All are true b. Only I & II c. Only I & III d. Only II & III

17. Assertion (A): CO_2 must be eliminated from the body

Reason (R):CO_2 will lower blood pH and threatening homeostasis

a. A and R are correct and R is the correct explanation of A

b. A and R are correct and R is not the correct explanation of A

c. A is true R is false d. A is false R is true

18. If the partial pressure of oxygen is 95 mm Hg, the percentage of haemoglobin saturation is

a.48 % b. 80 % c. 97 % d. 50%

19. Assertion: Though PCO_2 in alveolar air is much less compared to PO_2 more percentage of CO_2 dissolves in plasma than O_2

Reason: The solubility of CO_2 is 20-25 times greater than that of O_2

a. A and R are correct and R is the correct explanation of A

b. A and R are correct and R is not the correct explanation of A

c. A is true R is false

d. A is false R is true

20. Inspiration is

a. An active process with decrease of volume of thoracic cavity

b. An active process with increase of volume of the thoracic cavity

c. Passive process with decrease of volume of thoracic cavity

d. Passive process with increase of volume of thoracic cavity

21. During rest when PO_2 is 40 mm Hg, the Hb saturation with O_2 is

a.40% b. 97 % c. 75% d. 50%

22. Study the following reactions:

1. $Hb+O_2 \rightarrow HbO_2$ 2. $CO_2+H_2O \rightarrow H_2CO_3 \rightarrow H^+ + HCO_3$

3. $Hb+CO_2 \rightarrow HbCO_2$ 4. $HbH+O_2 \rightarrow HbO_2+H^+$

Which of the above reactions take place at he pulmonary capillaries?

a. 1 and 4 b. 2 and 3 c. 1 and 3 d. 3 and 4

23. Statement (S): During inspiration, the volume of thoracic cavity increase

Reason :(R): This happens due to the relaxation of muscles of diaphragm and external intercostal muscles.

a. Both (S) and (R) are true but (R) is the correct explanation of (S)

b Both (S) and (R) are true but (R) is not the correct explanation of (S)

c. Only (S) is correct but (R) is wrong d. Both (S) and (R) are wrong

24. Study the following statements regarding transport of gases and lung volumes and capacities

I. Reaction between CO_2 and water in plasma occurs faster than in RBC

II. Formation and breakdown of carbonic acid in RBC are enhanced by carbonic anhydrase

III. Haemoglobin is 75% saturation when PO_2 is 40 mm Hg

IV. Maximum percentage of CO_2 is transported as carbamino compounds

Which of the above are correct?

a. III, IV b. II, III, IV c. I, III, IV d. II,III

25. The following are the statements regarding transport of gases in rabbit

I. Most of the CO_2 is transported as carbamino compounds

II. Carbamino haemoglobin is formed in blood plasma

III. Carbonic anhydrase helps in both the formation and dissociation of carbonic acid

IV. Most of the O_2 is transported in the form of oxyhaemoglobin

The **incorrect** statements (s) is/are

a. I & II b. Only I c. II & III d. I & III

26. During transport of respiratory gases unloading of oxygen from haemoglobin is enhanced by

a. Increase in pH b. Decrease in CO_2

c. Decrease in temperature d. Decrease in pH

27. One of the following can not enhance the unloading of oxygen from haemoglobin at the level of tissues

a. Increase of CO_2 b. Increase of pH

c. Decrease of pH d. Increase of temperature

28. Match the following:

List - I	**List - II**
A. Chloride shift	1. Effect of CO_2 on O_2 carrying capacity of Hb
B. Bohr effect	2. Hamburger's phenomenon
C. Haemoglobin	3. Respiratory parts
D. Natural conditioners of air	4. Respiratory pigment

The correct match is:

a. A-1; B-3; C-4; D-2 b. A-1; B-2; C-4; D-3

c. A-2; B-1; C-4; D-3 d. A-1; B-2; C-3; D-4

29. Under normal conditions, every 100ml of oxygenated blood (If haemoglobin is 100% Saturated) contains about

a. 5ml of o_2 b. 20 ml of O_2 c. 15 ml of O_2 d. 10 ml of O_2

30. Study the following statements

I. Effect of CO_2 and H^+ on the oxygen affinity of haemoglobin is termed Bohr Effect

II. Formation of carbonic acid is faster in plasma than RBC due to carbonic anhydrase

III. Decrease in pH increases in CO_2 and temperature shifts oxy haemoglobin dissociation curve to the left side

IV. Exchange of chloride and bicarbonate ions between RBC and plasma is called Hamberger's phenomenon

Correct statements are:

a. I & II b. II & III c. I & IV d. II & IV

31. Carbonic anhydrase is found in

a. Leucocytes b. Lymphocytes c. Erythrocytes d. Blood plasma

32. Find the correct statement among the following:

a. External intercostal muscles, radial muscles contract and volume of the thoracic cavity de creases during inspiration

b. External intercostal muscles, radial muscles relax and volume of the thoracic cavity decreases during expiration

c. Radial and intercostal muscles contract and pressure in the thoracic cavity decreases during expiration

d. Radial muscles and external intercostal muscles contract and size of the thoracic cavity increases during inspiration

33. Assertioons (A): Percentage of saturation of haemoglobin of oxygen is high in lungs

Reason (R): Respiratory organs are with low CO_2, high O_2 concentration and with low temperature

a. A and R are correct and R is the correct explanation of A

b. A and R are correct and R is not the correct explanation of A

c. A is true R is false d. A is false R is true

34. During inspiration

a. Diaphragm becomes dome shaped b. Diaphragm becomes flat

c. Diaphragm becomes round d. Diaphragm do not undergo any change

35. **Assertion (A):** In rabbit carbonic acid is more formed inside the RBC than the plasma

Reason (R): An enzyme called carboxylase which catalyses the reaction between CO_2 and H_2O is present inside RBC is more then in plasma

a. A and R are correct and R is the correct explanation of A

b. A and R are correct and R is not the correct explanation of A

c. A is true R is false d. A is false R is true

36. **In which of the following conditions oxyhaemoglobin dissociates and release oxygen**

a. Decrease of pH and temperature of the tissue

b. Low tension of CO_2 and high tension of O_2 of tissues

c. Low pH, high tension of CO_2 and low tension of O_2 at tissues

d. Low pH high tension of CO_2 and low tension of O_2 at lungs

37. **Following are the statements about transport of respiratory gases in rabbit**

I. Percentage of saturation of haemoglobin occurs more under low temperature and CO_2 which cause shifting of oxygen dissociation curve towards y-axis

II. In systemic arteries Po_2 is about 95 mm Hg so 97% Hb is saturated in them

III. CO_2 is transported in the form of carbamino compounds through plasma only

IV. Chloride shift regulates electro neutrality of cell membrane of RBC during transport of O_2 only

a. I, II and IV are correct b. Only I and II are correct

c. II, III and IV are correct d. All are correct

38. **Which of the following conditions will shift the dissociation curve of oxyhaemoglobin to the left/ towards the y-axis?**

i. High temperature i i) Low PO_2 iii) Low hydrogen ion concentration iv) Low PCO_2

a. i and iii only b. i, ii and iii only c. iii and iv only d. ii and iii only

39. **Increased hydrogen ion concentration in the blood**

I. Induces release of more oxygen by haemoglobin

II. Shifts the oxygen dissociation curve of oxyhaemoglobin to the right

III. Shifts the oxygen dissociation curve of oxyhaemoglobin towards the y-axis

Spot the **correct** statements:

a. I and II only b. I only c. I and III only d. I,II and III

40. Displacement of oxygen from oxyhaemoglobin due to increase in CO_2 occurs in the tissues. This phenomenon is called

a. Chloride shift b. Haldane effect c. Bohr Effect d. Reverse chloride shift

41. The vocal cords in the larynx extend between the cartilages called

a. Cricoid and arytenoids b. Arytenoids and thyroid

c. Thyroid and cricoid d. Cricoid and epiglottis

42. The following are different components of the path of passage of air during inspiration. Arrange these components in the correct sequence, from the outside to the inside

I. Respiratory bronchioles II. Tertiary bronchioles III. Secondary bronchioles

IV. Terminal bronchioles V. Alveolar duct VI. Primary bronchioles

(Note): Neglect the intervening components, if any missing in the list given above

a. VIII-VII-VI-III-II-IV-I-V b. VIII-VII-III-VI-II-IV-V-I

c. VII-VIII-VI-III-II-IV-I-V d. VIII-VII-VI-IV-III-II-I-V

43. Assertion (A): A rabbit in advanced pregnancy is likely to feel shortage of breath after a brisk run even for a short distance

Reason (R): The above said rabbit is not able to breathe in the normal quantum of air because the diaphragm cannot become dome shaped due to the occupation of the lower abdomen with foetus

a. A and R are correct and R is the correct explanation of A

b. A and R are correct and R is not the correct explanation of A

c. A is true R is false d. A is false R is true

44. Amount of O_2 delivered to the tissues of various body parts except lungs in each cardiac out put when the heart beats at the rate of 72 times per minute is

a. 100 ml b. 150 ml c. 252 ml d. 600 ml

45. Match the following:

A) Tidal volume	I) Maximum volume of air that can be exhaled after deepest breath
B) Residual volume	II) Volume of air that remains in the lungs at all times
C) Vital capacity	III) Volume of air that can be exhaled after tidal volume
D) Expiratory reserve volume:	IV) Volume of air moved in or out of the lungs

The correct match is:

	A	B	C	D		A	B	C	D
a.	II	IV	I	III	b.	IV	II	I	III
c.	III	IV	I	II	d.	I	II	III	IV

KEY

1.	a	11.	a	21.	c	31.	c	41.	b
2.	d	12.	a	22.	a	32.	b	42.	a
3.	d	13.	c	23.	c	33.	a	43.	c
4.	c	14.	a	24.	d	34.	b	44.	c
5.	a	15.	b	25.	a	35.	c	45.	b
6.	b	16.	a	26.	d	36.	c		
7.	c	17.	a	27.	b	37.	b		
8.	a	18.	c	28.	c	38.	c		
9.	c	19.	a	29.	a	39.	a		
10.	a	20.	b	30.	c	40.	c		