

Topic :- Breathing and Exchange of breathing Gases

- 1 **(b)**
In higher organisms, the sites of aerobic respiration are
(i) **Cytoplasm** Where, glycolysis takes place
(ii) **Mitochondria** Where, Kreb's cycle takes place
- 2 **(c)**
The total thickness of the diffusion membrane is less than 1 millimeter.
The diffusion membrane is made up of three major layers (figure) namely, the thin squamous epithelium of alveoli, the endothelium of alveolar capillaries and the basement substance in between them. However, its total thickness is much less than a millimeter. Therefore, all the factors in our body are favourable for the diffusion of O₂ from alveoli to tissues and that of CO₂ from the tissues to alveoli
- 3 **(a)**
Diaphragm is made up of involuntary muscles and found in mammals only. During expiration, diaphragm is relaxed and dome-shaped, whereas during inspiration diaphragm is contracted and flat.
- 4 **(a)**
Oxygen carrying capacity of whole blood is much higher than that of plasma and oxygen content of blood leaving the lungs is greater than that of blood entering the lungs thus, most oxygen is transported from lungs to the tissue combined with haemoglobin rather than dissolved in blood plasma.
- 5 **(d)**
Our tissue are able to utilized only 25% of O₂ carried by arterial blood. The venous blood is stil 75% saturated with O₂. This O₂ acts as a reserve during muscular excuse.
- 6 **(a)**
Trachea It is about four and half inches long with 'C' shaped rings of hyaline cartilage in its walls. These rings of cartilage makes the wall non-collapsible. It is internally lined by pseudostratified ciliated squamous epithelium. Cilia pushes out the mucous

7 **(d)**
A-fermentation, B-ethyl alcohol, C-aerobically

8 **(c)**
The ventilation movement of the lungs is governed by diaphragm and intercoastal muscles

9 **(b)**
A-RBC, B-alveolar, C-bicarbonate, D-CO₂

10 **(c)**
Bronchioles are formed by branching of tertiary bronchi. Bronchioles divide into terminal bronchioles, respiratory bronchioles. Bronchioles are without cartilaginous rings.

11 **(a)**
Respiratory System

Conducting Portion	Respiratory Portion
The conducting portion provides a passage for the air. It conditions the incoming air by warming, moistening and cleaning it. It consists of nasopharynx, larynx, trahea, bronchi, bronchioles and terminal bronchioles	The respiratory portion consisting bronchioles, alveolar ducts and alveolar sacs, serves to get rid the body of CO ₂ and pick up oxygen. This system is derived from the endoderm



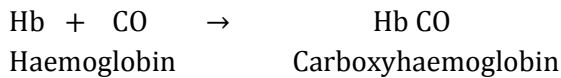
12 **(b)**
Respiration involves the following steps
(i) Breathing or pulmonary ventilation by which atmospheric air is drawn in and CO₂ rich alveolar air is released out
(ii) Diffusion of gases, *i.e.*, O₂ and CO₂ across alveolar membrane
(iii) Transport of the gases by blood
(iv) Diffusion of O₂ and CO₂ between the blood and tissue
(v) Utilisation of O₂ by the cells for catabolic reactions and the resultant release of CO₂

13 **(b)**
The diffusion membrane is made up of three major layers (figure) namely, the thin

squamous epithelium of alveoli, the endothelium of alveolar capillaries and the basement substance in between them. However, its total thickness is much less than a millimeter. Therefore, all the factors in our body are favourable for the diffusion of O_2 from alveoli to tissues and that of CO_2 from the tissues to alveoli

14 (d)

Carbon monoxide forms a stable compound with haemoglobin called **carboxyhaemoglobin** as affinity of haemoglobin for carbon monoxide is 250 times greater than its affinity for oxygen. In this form, haemoglobin does not carry oxygen resulting in death too.



15 (a)

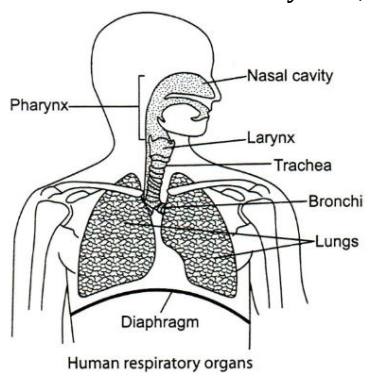


To maintain the neutrality of the plasma, HCO_3^- ions diffuse out into the plasma and ions enter into the RBC. The chloride content of the RBCs increases when oxygenated blood becomes deoxygenated

This is known as **Hamburger shift** or **chloride shift**. Because of it, the Cl^- content of the red cells in the venous blood is significantly greater than in arterial blood

16 (d)

Pair of external nostrils opens above the upper lips, which leads to nasal passage. It opens into the nasopharynx. Nasopharynx opens through the glottis of the larynx region into the trachea. Trachea is a straight tube extending upto mid-thoracic cavity, which divides at the right and left bronchi. Each bronchi undergoes repeated division to form secondary and tertiary bronchi and bronchioles ending up in very thin terminal bronchioles, which gives rise to a number of very thin, irregular walled, vascularized bag like structure called alveoli



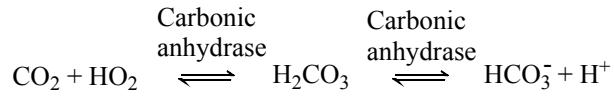
17 (a)

Oxygen is transported from the lungs to the cells by simple **diffusion**. The respiratory membrane (alveolar capillary membrane) has a limit of gaseous exchange between alveoli and pulmonary blood. This is called **diffusing capacity**.

18

(c)

RBCs contain very high concentration of enzymes, carbonic anhydrase and minute quantities of the same is present in the plasma too. *This enzyme facilitates the following reaction in both directions*



19

(b)

The movement of chloride ions into erythrocytes from the plasma to maintain osmotic balance during transport of gases is known as **Hamburger phenomenon**.

20

(a)

Exchange part of the respiratory system is the actual site through which the exchange of O_2 between the blood and atmospheric air takes place. Alveoli is the part of lungs at which this exchange takes place

PE

ANSWER-KEY										
Q.	1	2	3	4	5	6	7	8	9	10
A.	b	c	a	a	d	a	d	c	b	c
Q.	11	12	13	14	15	16	17	18	19	20
A.	a	b	b	d	a	d	a	c	b	a

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