DPP
DAILY PRACTICE PROBLEMS

Class : XIth | Solutions | Subject : Biology

Date : | DPP No. : 5

Topic :- Breathing and Exchange of Gases

1 (b)

A-97, B-RBC, C-3, D-Plasma

2 (c)

Systemic artery carries deoxygenated blood from the right ventricle to the lungs for the oxygenation of deoxygenated blood

3 (c)

A-CO_2; B-rhythm

4 (d)

Alveoli (thin, irregular-walled and vascularized bag-like structure at the end of bronchiole) are the primary sites of exchange of gases. O_2 and CO_2 are exchanged in these sites by simple diffusion mainly based on pressure/concentration gradient. Solubility of the gases as well as thickness of the membranes involved in diffusion are also some important factors that can affect the rate of diffusion. Reactivity of the gases does not affect the rate of alveolar diffusion.

5 (a)

Tidal volume is the volume of air inspired or expired with each normal breath. This is about 500 mL (0.5 L) in adult person.

6 (c)

The partial pressure of $CO_2(\rho CO_2)$ is the highest in tissues.

Partial pressure of respiratory gases in-mm Hg

Respiratory gases	Inspired air on atmospheric air	Alveolar air	Deoxygenated blood	Oxygenated blood	Expired air	Tissue cells
ρO_2	158	100	40	95	116	40
ρCO_2	0.3	40	45	40	32	45

7 (b)

ρCO_2 is low and ρO_2 is high in alveoli.

When ρCO_2 is high and ρO_2 is low as in the tissues, more binding of CO_2 occurs whereas when the ρCO_2 is low and ρO_2 is high as in the alveoli, dissociation of CO_2 from carbamino haemoglobin takes place, *i.e.,* CO_2 which is bound to haemoglobin from the tissues is delivered to alveoli

8 (a)

Another centre present in the pons region of the brain called pneumotaxic centre can moderate its functions of the respiratory rhythm centre. Neural signal from this centre can reduce the duration of inspiration and thereby, after the respiratory rate

9 (b)

A – Air Expelled from Lungs

B – Ribs and sternum returned to original position

C – Diaphragm relaxed and arched upward

10 (b)

2-3 DPG (2-3 diphosphoglycerate) concentration increases in hilly areas. This decreases the affinity of O_2 to haemoglobin and facilitates the unloading of O_2 to tissues

11 (d)

The epiglottis is a flap that is made up of elastic cartilage tissue covered with a mucous membrane, attached to the entrance of the larynx. It prevents the entry of food into the larynx, and directs it to the oesophagus. Due to improper movement of epiglottis, one may suddenly start coughing while swallowing some food.

12 (a)

A-vertebral column, B-sternum, C-ribs, D-diaphragm

13 (c)

Primary bronchus of lungs divide to form secondary bronchi which divide to form tertiary bronchi. The tertiary bronchi subdivided into bronchioles. The bronchioles open to alveol through alveolar duct, atria and alveolar sacs. The alveoli have very thin wall consisting of squamous epithelium. The wall of alveoli has extensive network of blood capillaries. Due to very intimate contact of blood capillaries with the alveoli, the exchange of gases takes place easily.

14 (a)

Carbon monoxide is a poisonous gas. It combines with haemoglobin more rapidly than oxygen to form carboxy haemoglobin. A carbon monoxide pressure of about 0.7 mm Hg (conc. of about 1%) in alveolar air can be lethal.

15 (c)

Ketoacidosis is a type of metabolic acidosis, which is caused by the high concentration of ketone bodies formed by the breakdown of fatty acids and the deamination of amino acids. Generally, it takes place when there is no adequate glucose for the oxidation in body

16 (a)

Larynx is a cartilaginous box, which helps in sound production and hence called sound box. Until puberty, there is a little difference in the size of larynx (sound box) in males and females. Thereafter, it grows larger and become prominent in males. Therefore, it is called

Adam's apple in man. It is the first part of the trachea present in the neck

17 (d)

All of these.

Four molecules of O_2

Each haemoglobin molecule can carry a maximum of four molecules of O_2

$Hb_4 + 4O_2 \rightarrow Hb_4O_8$

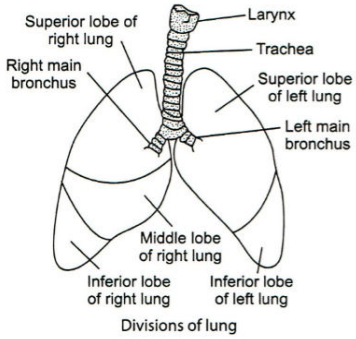
Binding of oxygen with haemoglobin is primarily related to the partial pressure of O_2, partial pressure of CO_2, hydrogen ion concentration and temperature

18 (d)

Bronchitis is aggravated by pollution. It involves permanent swelling and inflammation of bronchi, cough with thick mucus and pus cells are spitted out.

19 (a)

In humans, right lung is divided into three lobes and left lung is divided into two lobes



Divisions of lung

20 (d)

Pulmonary vein is the only vein in body, which carries oxygenated blood rather than deoxygenated blood. It carries the blood from the lungs to the left auricle of heart. From left auricle, blood goes to the left ventricle. Left ventricle distributes that blood all over the body

ANSWER-KEY										
Q.	1	2	3	4	5	6	7	8	9	10
A.	B	C	C	D	A	C	B	A	B	B
Q.	11	12	13	14	15	16	17	18	19	20
A.	D	A	C	A	C	A	D	D	A	D