DPP
DAILY PRACTICE PROBLEMS

Class : XIth **Subject : Biology**

Date : **Solutions** **DPP No. :9**

Topic :-Breathing and Exchange of Gases

1 (a)

Under the normal physiological conditions, 100 mL of the oxygenated blood can deliver around 5 mL O_2 to the body

2 (b)

In the tissues, where partial pressure of CO_2 is high due to catabolism, CO_2 diffuses into blood (RBCs and plasma) and forms HCO_3^- and H^+. At the alveolar site, where ρCO_2 is low, the reaction proceeds in the opposite direction, leading to the formation of H_2O and CO_2. Thus, CO_2 gets trapped as bicarbonate at the tissue level and transported to the alveoli and released as CO_2

3 (c)

Periodically, filling the lung with atmospheric air and then emptying, is called breathing or ventilation of lungs. Breathing in is called inspiration or inhalation and breathing out is called expiration or exhalation. During inhalation or inspiration, the diaphragm contracts putting backwards by partial flattening and increase the thoracic cavity lengthwise.

4 (c)

Expiration is a process by which CO_2 is expelled out from the lungs. Muscle fibres of the diaphragm relax make it convex, and decreasing the volume of thoracic cavity.

5 (b)

SARS (Severe Acute Respiratory Syndrome) spread recently in China, Hong Kong and Singapore. It is a viral disease caused by Paramyxo virus. Paramyxo virus of SARS is related to corona virus family (corona virus causes common cold).

6 (c)

Residual Volume (RV) is the volume of air present in lungs even after a forcible expiration, averaging about 1200 mL.

7 (c)

Brain's Part	Control/Function
Cerebellum	Coordination of muscular movement
Cerebrum	Voluntary function
Medulla oblongata	Respiration
Hypothalam -us	Temperature

8 (c)

In alveoli, exchange of gases takes place in man.

10 (a)

A-45 mm, B-40 mm.

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

11 (c)

Larynx is present in between the epiglottis and trachea

12 (a)

Major steps involving respiration are

Step I Utilisation of O_2 by cell for catabolic reactions

Step II Diffusion of O_2 and CO_2 between blood and tissues

Step III Transportation by blood

Step IV Diffusion of gases (O_2 and CO_2) through alveolar membrane

Step IV CO_2 goes out and atmospheric air is drawn in

13 (d)

A-increases, B-decreases, C-outside, D-inspiration

14 (b)

Residual volume remains in the lungs even after the forcible expiration. That's why, spirometer can't measure the volume of residual volume

15 (a)

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

16 (d)

Aerobic Respiration Cells utilise O_2 from atmospheric air or from water to oxidise the nutrients. *It involves*

(i) **External Respiration** Gaseous exchange of O_2 and CO_2 between the blood and air (or water)

(ii) **Transport** of gases to tissues

(iii) **Internal Respiration** Gaseous exchange between the blood and tissues

(iv) **Cellular Respiration** Oxidation of nutrients in the cells and liberation of energy

17 (b)

CO_2 is carried by haemoglobin as carbamino haemoglobin (about 20-25%). This binding is related to the partial pressure of CO_2.ρO_2 is a major factor, which could effect this binding

18 (b)

Pressure contributed by the individual gas in a mixture of gases is called partial pressure and is represented as ρO_2 for oxygen and ρCO_2 for carbon dioxide

19 (c)

Vocal cords Vocal cords are two pairs of folds of mucous membrane that extends into the lumen from the sides of larynx. Sound is produced by the vocal cords

20 (a)

Book lungs are named so because their folds resemble the leaves in a book. In this, the exchange of gases takes place between the interlamellar spaces and the venous blood through the thin membranous walls of the lamellae.

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