

Breathing and Exchange of Gases

I. Select the correct answers from the following questions:

Question 1.

Which of the following is not a step in the process of respiration?

- (a) Breathing
- (b) Diffusion of oxygen from blood to tissues
- (c) Production of energy
- (d) Diffusion of oxygen from tissues to blood

▼ [Answer](#)

Answer: (a) Breathing

Question 2.

The atmosphere contains CO₂ by volume

- (a) 0.1%
- (b) 0.5%
- (c) 0.03%
- (d) 0.3%

▼ [Answer](#)

Answer: (c) 0.03%

Question 3.

Sudden deep inspiration is due to

- (a) Increase in concentration of O₂
- (b) Increase in concentration of CO₂
- (c) Decrease in concentration of CO₂
- (d) Decrease in concentration of CO₂

▼ [Answer](#)

Answer: (b) Increase in concentration of CO₂

Question 4.

A man respires about

- (a) 40 times per minute
- (b) 72 times per minute
- (c) 12-16 times per minute
- (d) 100 times per minute

▼ [Answer](#)

Answer: (c) 12-16 times per minute

Question 5.

In which form CO_2 is carried in blood

- (a) Sodium bicarbonate
- (b) Sodium carbonate
- (c) Potassium bicarbonate
- (d) Potassium carbonate

▼ [Answer](#)

Answer: (d) Potassium carbonate

Question 6.

In man, gas exchange between the environment and the body takes place in

- (a) Bronchi
- (b) Larynx
- (c) Alveoli
- (d) Trachea

▼ [Answer](#)

Answer: (c) Alveoli

Question 7.

Inspiration would not occur if the

- (a) Diaphragm is elevated
- (b) Diaphragm is lowered
- (c) Ribs are elevated
- (d) Ribs are elevated and diaphragm is lowered

▼ [Answer](#)

Answer: (a) Diaphragm is elevated

Question 8.

Which one of the following does not contribute to the breathing movement in mammals?

- (a) Abdominal muscles
- (b) Larynx
- (c) Ribs
- (d) Diaphragm

▼ [Answer](#)

Answer: (c) Ribs

Question 9.

Breathing centre that controls normal breathing in mammals lies in

- (a) Mid brain
- (b) Cerebellum
- (c) Cerebrum
- (d) Medulla oblongata

▼ Answer

Answer: (a) Mid brain

Question 10.

If a person stays on hill for some days:

- (a) His body will step up production of RBCs
- (b) His body will step down production of RBCs
- (c) His RBCs will turn into very large cells
- (d) No change in the contents of RBCs in the body

▼ Answer

Answer: (a) His body will step up production of RBCs

Question 11.

The largest quantity of air that can be expired after a maximal inspiratory effort is

- (a) Tidal volume
- (b) Vital capacity of lungs
- (c) Lung volume
- (d) Residual volume

▼ Answer

Answer: (c) Lung volume

Question 12.

Which of the following facts suggests that O_2 is transported from lungs to the tissues combined with haemoglobin rather than dissolved in blood plasma:

- (a) Oxyhaemoglobin can dissociate into haemoglobin and O_2
- (b) An increase in CO_2 concentration decreases the O_2 affinity of haemoglobin
- (c) Haemoglobin can combine with O_2
- (d) O_2 carrying capacity of whole blood is higher than that of plasma and O_2 content of blood leaving the lungs is greater than that of blood entering the lungs.

▼ Answer

Answer: (d) O_2 carrying capacity of whole blood is higher than that of plasma and O_2 content of blood leaving the lungs is greater than that of blood entering the lungs.

Question 13.

If a man from sea coast of Mumbai goes to Mount Everest:

- (a) His breathing rate and heart beat will increase
- (b) His breathing rate and heart beat will decrease
- (c) His breathing rate will increase, but heart beat will decrease
- (d) His breathing rate will decrease, but heart beat will increase.

▼ Answer

Answer: (a) His breathing rate and heart beat will increase

Question 14.

Body tissues obtain oxygen from oxyhaemoglobin because of its dissociation caused by

- (a) Low CO₂ concentration
- (b) Low O₂ and high CO₃ concentration
- (c) High CO₂ concentration
- (d) Low oxygen concentration

▼ [Answer](#)

Answer: (b) Low O₂ and high CO₂ concentration

Question 15.

Lungs are covered by

- (a) Perichondrium
- (b) Pleura
- (c) Periosteum
- (d) Pericardium

▼ [Answer](#)

Answer: (d) Pericardium

Question 16.

Tidal air is

- (a) Total air taken into lungs
- (b) Air that comes in and goes out in normal breathing
- (c) Air inhaled in deep breathing
- (d) Air expelled forcibly after normal inspiration

▼ [Answer](#)

Answer: (b) Air that comes in and goes out in normal breathing

Question 17.

Lung lobes of human being are

- (a) 2 left and 3 right
- (b) 3 in each
- (c) 2 in each
- (d) 3 left and 2 right

▼ [Answer](#)

Answer: (a) 2 left and 3 right

Question 18.

Body cavity is divided into thoracic

- (a) Heart
- (b) Liver

- (c) Lungs
- (d) Diaphragm

▼ [Answer](#)

Answer: (d) Diaphragm

Question 19.

Breathing becomes faster in fever because

- (a) Fever stimulates the respiratory centre of the man
- (b) Oxygen carrying capacity of blood becomes lower
- (c) Oxygen is used in fighting germs
- (d) Increase in temperature increases metabolic rate requiring more oxygen

▼ [Answer](#)

Answer: (d) Increase in temperature increases metabolic rate requiring more oxygen

Question 20.

Excess of water absorbed by human being is passed out in urine. Other sources is

- (a) Inspiration
- (b) Expiration
- (c) Defaecation
- (d) Salivation

▼ [Answer](#)

Answer: (b) Expiration

Question 21.

Exchange of gases between the blood and the tissue of the body is called

- (a) Internal respiration
- (b) Cellular respiration
- (c) External respiration
- (d) Counter current exchange

▼ [Answer](#)

Answer: (a) Internal respiration

Question 22.

Respiration involves in which following step:

- (a) Transport of gases by the blood
- (b) Diffusion of O_2 and CO_2 between the blood and the tissues
- (c) Diffusion of gases (O_2 and CO_2) across alveolar membrane.
- (d) All of these functions.

▼ [Answer](#)

Answer: (d) All of these functions.

II. Fill in the blanks:

Question 1.

This process of exchange exchange of O_2 from the atmosphere with CO_2 produced by the cells is called commonly known as

▼ Answer

Answer: breathing, respiration

Question 2.

..... use their moist cuticle for respiration.

▼ Answer

Answer: Earthworms

Question 3.

Among vertebrates, fishes respire through gills whereas and and use

▼ Answer

Answer: reptiles, birds, mammals, lungs

Question 4.

..... like can respire through their moist skin also.

▼ Answer

Answer: Nasopharynx, frogs

Question 5.

The nasal chamber opens into which is a portion of pharynx, the common passage for and

▼ Answer

Answer: nasopharynx, food, air

Question 6.

Nasopharynx opens through glottis of the larynx region into the

▼ Answer

Answer: trachea

Question 7.

The lungs are situated in the thoracic chamber which is anatomically an

▼ Answer

Answer: air-tight chamber

Question 8.

Breathing involves two stages: during which atmospheric air is drawn in and by which the alveolar air is released out.

▼ Answer

Answer: inspiration, expiration

Question 9.

On an average, a healthy human respire times/minute.

▼ Answer

Answer: 12-16

Question 10.

Total of air a person can inspire after a normal

▼ Answer

Answer: Volume, expiration

Question 11.

Volume of air that will remain in the after a normal expiration. This includes

▼ Answer

Answer: lungs, ERV+RV

Question 12.

..... and are exchanged in these sites by simple diffusion mainly based on pressure/concentration gradient.

▼ Answer

Answer: O₂, CO₂

Question 13.

All the factors in our body are favourable for diffusion of from alveoli to tissues and that of from tissues to alveoli.

▼ Answer

Answer: O₂, CO₂

Question 14.

About of CO₂ is carried in a dissolved state through

▼ [Answer](#)

Answer: 7 percent, plasma

Question 15.

O₂ can bind with haemoglobin in a reversible manner to form

▼ [Answer](#)

Answer: oxyhaemoglobin

III. Mark the statement True (T) or False (F)

Question 1.

Each haemoglobin molecule can carry a maximum of four molecules of O₂.

▼ [Answer](#)

Answer: True.

Question 2.

O₂ is carried by haemoglobin as carbamino-haemoglobin (about 25-20 percent).

▼ [Answer](#)

Answer: False.

Question 3.

Every 10 mL of oxygenated blood can deliver around 10 ml of O₂ to the tissues under normal physiological conditions.

▼ [Answer](#)

Answer: False

Question 4.

In the alveoli, where there is low pO₂, high pCO₂, higher H⁺ concentration and lesser temperature.

▼ [Answer](#)

Answer: False

Question 5.

Every 100mL of deoxygenated blood delivers approximately 4 ml of CO₂ to the alveoli.

▼ [Answer](#)

Answer: True

Question 6.

The role of oxygen in the regulation of respiratory rhythm is quite insignificant.

▼ [Answer](#)

Answer: True

Question 7.

Asthma is a difficulty in breathing causing wheezing due to inflammation of bronchi and bronchioles.

▼ [Answer](#)

Answer: True

Question 8.

In certain industries, especially those involving grinding or stone-breaking, so much dust is produced that the defence mechanism of the body cannot fully cope with.

▼ [Answer](#)

Answer: True

Question 9.

Emphysema is a chronic disorder in which alveolar walls are damaged due to which respiratory surface is decreased. One of the major causes of this is cigarette smoking.

▼ [Answer](#)

Answer: True

Question 10.

The first step in respiration is breathing by which atmospheric air is taken in and the alveolar air is released out.

▼ [Answer](#)

Answer: True.

Question 11.

It is approx 800 ml., i.e., a healthy man can inspire or expire approximately 2000 to 8000 ml of air per minute.

▼ [Answer](#)

Answer: False

Question 12.

Volume of air remaining in the lungs even after a forcible expiration. This averages-100 mL to 200 mL.

▼ [Answer](#)

Answer: False

IV. Match the items in column I with Column II

Column I	Column II
(a) Tidal volume	1. averages 1000 ml to 1100 ml
(b) RV	2. averages 2500 ml to 3000 ml
(c) ERV	3. TV + IRV
(d) Inspiratory capacity	4. approximately 6000 to 8000 ml of air per minute
(e) IRV	5. averages 1100 ml to 1200 ml
(f) EC	6. pO ₂ for oxygen and pCO ₂ for carbon dioxide
(g) FRC	7. transported by RBC whereas 70 percent of it is carried as bicarbonate.
(h) Vital capacity	8. TV + ERV
(i) Total lung Capacity	9. transported by RBCs in the blood.
(j) Partial pressure	10. for respiration
(k) About 97 percent of O ₂ is	11. called lungs
(l) Nearly, 20-25 percent of CO ₂ is	12. ERV + RV
(m) Gills	13. This includes RV, ERV, TV and IRV
(n) Vascularised bags	14. This includes ERV, TV and IRV
(o) Larynx is a cartilaginous box	15. Sound box

▼ [Answer](#)

Answer:

Column I	Column II
(a) Tidal volume	4. approximately 6000 to 8000 ml of air per minute
(b) RV	5. averages 1100 ml to 1200 ml
(c) ERV	1. averages 1000 ml to 1100 ml
(d) Inspiratory capacity	3. TV + IRV
(e) IRV	2. averages 2500 ml to 3000 ml
(f) EC	8. TV + ERV
(g) FRC	12. ERV + RV

(h) Vital capacity	14. This includes ERV, TV and IRV
(i) Total lung Capacity	13. This includes RV, ERV, TV and IRV
(j) Partial pressure	6. pO_2 for oxygen and pCO_2 for carbon dioxide
(k) About 97 percent of O_2 is	9. transported by RBCs in the blood.
(l) Nearly, 20-25 percent of CO_2 is	7. transported by RBC whereas 70 percent of it is carried as bicarbonate.
(m) Gills	10. for respiration
(n) Vascularised bags	11. called lungs
(o) Larynx is a cartilaginous box	15. Sound box