

CBT DECEMBER 2024
CLASS – XI: BIOLOGY

GENERAL INSTRUCTION :

SCORE AND REVIEW OF ALL THE QUESTIONS WILL BE PROVIDED IN THE EMAIL TO ALL THE STUDENTS ON NEXT DAY AND AFTER CLOSING OF QUIZ TIME.
IMPORTANT : ALL THE STUDENTS SHOULD FILL THE CORRECT SCHOOL NAME FROM DROP DOWN BUTTON

Q1 The respiratory system plays a crucial role in supplying oxygen to the body and removing carbon dioxide, which is a waste product of cellular metabolism. It consists of several components, including the airways (such as the bronchi and bronchioles) and the alveoli, where gas exchange takes place. The lungs are protected by a double-layered membrane called the pleura, which contains pleural fluid to reduce friction during breathing.

The respiratory system can be divided into two main parts: the conduction part and the exchange part. The conduction part includes all the respiratory structures from the nostrils to the alveoli and is responsible for conducting atmospheric air to the lungs. It also helps in filtering, moisturizing, and warming the air before it reaches the lungs. On the other hand, the exchange part is where oxygen diffuses into the bloodstream and carbon dioxide diffuses out of the bloodstream into the lungs.

Located in the chest cavity, the lungs are surrounded by the spine, sternum, ribs, and diaphragm. Changes in the volume of the chest cavity, caused by the movement of the diaphragm and rib muscles, result in changes in lung volume, which are essential for breathing. The process of breathing, or lung ventilation, involves the inhalation of atmospheric air rich in oxygen and the exhalation of alveolar air rich in carbon dioxide. Gas exchange occurs in the alveoli, where oxygen and carbon dioxide diffuse across the alveolar membrane into and out of the bloodstream, respectively. These gases are then transported through the blood to various organs and tissues, where oxygen is used for cellular metabolism and carbon dioxide is produced as a byproduct. This exchange of gases between the blood and body tissues is essential for cellular respiration, which provides the energy needed for various metabolic processes in the body.



1. Solubility of carbon dioxide is _____ than oxygen.

- a) more
- b) less
- c) 50 times more
- d) equal

FEEDBACK

Answer: a

Explanation: The solubility of carbon dioxide is 20-25 times higher than that of oxygen, therefore the amount of carbon dioxide that can diffuse through the diffusion membrane per unit difference in partial pressure is much higher compared to that of oxygen.

2. Partial pressure of oxygen in alveolar air is _____

- a) 159 mm Hg
- b) 90 mm Hg
- c) 104 mm Hg
- d) 45 mm Hg

FEEDBACK

Answer: c

Explanation: The Partial pressure of oxygen in alveolar air is 104 mm Hg, its value in arterial blood is 40 mm Hg. So, oxygen goes from alveolar air to arterial air. At the time of diffusion, gases move from high partial pressure to low partial pressure.

3. On which of the following factors diffusion does not depend?

- a) Solubility of gases

- b) Thickness of the respiratory membrane
- c) Partial pressure difference
- d) Molecular weight of gases

FEEDBACK

Answer: d

Explanation: Diffusing capacity depends on solubility of gases, thickness of the respiratory membrane, partial pressure difference. These all factors play an important role in the exchange of gases through the process of simple diffusion.

4. Which one of the following does not consist diffusion membrane?
- a) Thin squamous epithelium of alveoli
 - b) Cuboidal epithelium of alveoli
 - c) Basement membrane
 - d) Endothelium of blood capillaries

FEEDBACK

Answer: b

Explanation: Alveoli is made up of simple squamous epithelium. Diffusion membrane is made up of three major layers: Thin squamous epithelium of alveoli, endothelium of blood capillaries, basement substances in between them.

5. Assertion :Alveoli are the primary sites for exchange of gases. Reason: All factors in our body are favourable for the diffusion of O₂ from alveoli to tissues and that of CO₂ from tissues to alveoli.
- A. Both Assertion and Reason are correct and Reason is the correct explanation for Assertion
 - B. Both Assertion and Reason are correct but Reason is not the correct explanation for Assertion
 - C. Assertion is correct but Reason is incorrect
 - D. Both Assertion and Reason are incorrect

FEEDBACK

Answer: b

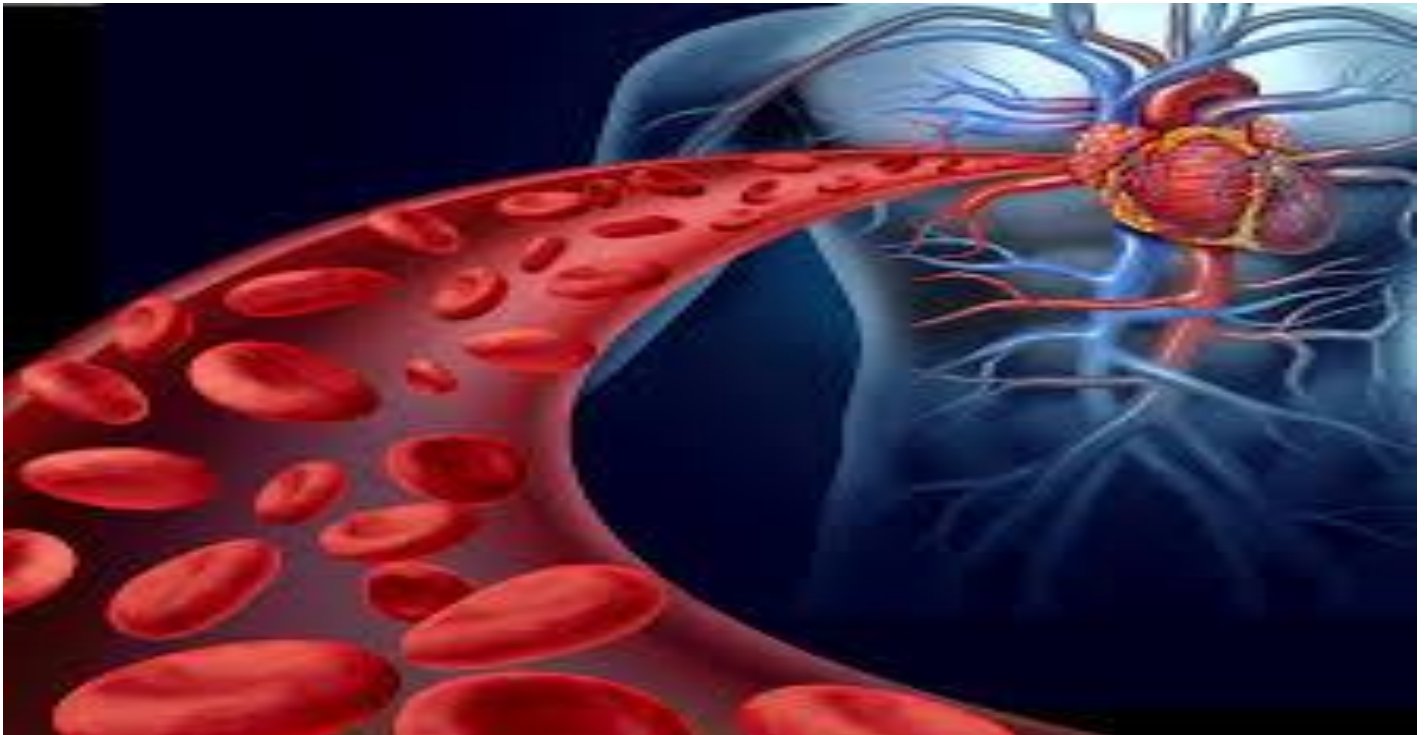
The correct option is B Both Assertion and Reason are correct but Reason is not the correct explanation for Assertion

The solubility of the gases, as well as the thickness of the membranes involved in diffusion, are important factors that affect the rate of diffusion. A gradient of partial pressure is present for oxygen from alveoli to blood and blood to tissue. Similarly, a gradient of CO₂ is present in the opposite direction i.e., from tissues to blood and blood to alveoli. It is further dependent on the solubility of the diffusing gases. As the solubility of CO₂ is 20-25 times higher than that of O₂, the amount of CO₂ that can diffuse through the diffusion membrane per unit difference in partial pressure is much higher compared to that of O₂. Therefore, all the factors in our body are favourable for diffusion of O₂ from alveoli to tissues and that of CO₂ from tissues to alveoli. The alveolus is the primary site of exchange as it has an extensive network of blood capillaries and consists of squamous epithelium. Due to the very intimate contact of blood capillaries with the alveoli, the exchange of gases takes place easily.

So the correct answer is 'Both Assertion and Reason are correct but Reason is not the correct explanation for Assertion'.

Q2 The mechanism by which the body stops bleeding to prevent constant loss of blood is known as hemostasis. The entire process is divided here into three major steps:

- The primary hemostasis involves the process of vasoconstriction, which responds to the injury of the body in the vascular wall. Once injured, the vascular walls react immediately by reducing the amount of blood flow in the infected area.
- Next, the platelets play a key role in covering the injured area to stop the bleeding. They also activate a process that forms a fibrin clot known as the secondary hemostasis. This leads to the release of stored granular contents which contain serotonin, ADP and thromboxane, which results in further activation of platelets in the blood plasma.
- Since the platelets alone could not secure the damages caused to the vessel walls, thus a blood clot should be formed necessarily. This formation of the blood clots depends on several clotting factors which activate each other in the clotting cascade.
- This cascade results in the formation of fibrinogen, which is a soluble plasma [protein](#). The fibrinogen is converted into fibrin proteins and they finally stick together to form a clot. Platelet clots are termed white thrombus and if the red blood cells are also present, it is known as red thrombus.



1. What prevents clotting of blood in blood vessels?

- a) Serotonin
- b) Fibrinogen
- c) Heparin
- d) Fibrin

FEEDBACK

Answer: c

Explanation: Heparin is used as an anticoagulant. It inhibits reactions that lead to the clotting of blood and the formation of fibrin clots both in vitro and in vivo.

2. Which of the following plasma protein is involved in coagulation of blood?

- a) Albumin
- b) Globulin
- c) Fibrinogen
- d) Amylase

FEEDBACK

Answer: c

Explanation: Fibrinogen is a glycoprotein, during tissue injury it is converted by thrombin to fibrin and subsequently to a fibrin based blood clot.

3. Assertion: Blood coagulates in injured blood vessels.

Reason: Uninjured blood vessels release an anticoagulant heparin.

A Both assertion and the reason are true and the reason is the correct explanation of the assertion.

B Both assertion and the reason are true but the reason is not the correct explanation of the assertion.

C The assertion is true but the reason is false

D Both assertion and reason are false.

FEEDBACK

Answer: D

Both assertion and reason are false.

When a blood vessel gets injured, blood platelets get clumped at the injured spot and release certain chemicals called platelet factors, which promote blood coagulation. Injured tissue or platelets also release coagulation promoting substances called thromboplastins which help in the formation of an enzyme prothrombinase. This enzyme activates inactive protein prothrombin into active thrombin which further promotes blood coagulation. Blood normally contains an anticoagulant called heparin which is released from the mast cell granules that prevents the activation of prothrombin in uninjured blood vessels. Blood also contains antithrombin which inhibits any thrombin formed accidentally. Moreover, uninjured tissues do not release thromboplastins, hence blood does not coagulate in uninjured blood vessels.

Q3 Heart disease is a general term that includes many types of heart problems. It's also called cardiovascular disease, which means heart and blood vessel disease.

Heart disease is the leading cause of death in the United States, but there are ways to prevent and manage many types of heart disease. Over time, unhealthy lifestyle habits can raise your risk heart disease



1. What is CAD also known as?

- a) Hypertension
- b) Arteriosclerosis
- c) Atherosclerosis
- d) Angina

FEEDBACK

Answer: c

Explanation: CAD or Coronary Artery Disease is also known as atherosclerosis. It occurs in the coronary arteries, which supply blood to the heart muscles. It leads to the narrowing of the arterial lumens.

2. Which of these diseases make the lumen of arteries narrower?

- a) Atherosclerosis
- b) Hypertension
- c) Angina
- d) Heart failure

FEEDBACK

Answer: a

Explanation: Atherosclerosis or Coronary Artery Disease (CAD) leads to the narrowing of the lumen of arteries. This occurs due to the deposition of cholesterol, fibrous tissue and calcium in the coronary arteries.

LINK FOR GOOGLE FORM

<https://forms.gle/y8zbcdbT9aXtP8TJ8>

