



BIOLOGY

BOOKS - PEARSON IIT JEE

FOUNDATION

LIFE PROCESSES IN HUMAN BEINGS - II

**(RESPIRATORY AND CIRCULATORY
SYSTEMS)**

Test Your Concepts

1. Blood is composed of different types of cells that are present in a liquid matrix called _____



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2. Blood cells are known as _____ .



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3. Corpuscles are generated by _____ cells present in the bone marrow.



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4. In an adult human being, the total volume of the blood is about _____ litres.



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5. The fluid that comes out from the blood vessels when the blood passes through the capillaries is known as _____



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6. The two main components of blood are _____ and _____ .



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7. Tissue fluid that is collected in lymphatic vessels is called _____ .



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8. The solid components of plasma include _____ and _____ substances.



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9. The protein present in plasma is known as _____



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10. Granulocytes have _____ cytoplasm and nucleus.



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11. The two nostrils are separated by a cartilaginous wall called _____ .



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12. The tiny hair-like structures present in the nostril are called _____ .



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13. _____ is known as the voice box.



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14. In human beings, a pair of lungs is present in the _____



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15. Blood cells are generated by the stem cells that are present in _____

A. Heart

B. Kidney

C. Bone marrow

D. Liver

Answer: C



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16. Which among the following do not come under blood vessel?

A. Arteries

B. Leucocytes

C. Veins

D. Blood capillaries

Answer: B



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17. Identify the function of lymph vessels.

A. Transportation of food material.

B. Defend the body against the
microorganisms.

C. Transportation of gases.

D. All of the above.

Answer: D



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18. Which among the following is not a blood cell?

A. Serum

B. Erythrocytes

C. Leucocytes

D. Thrombocytes

Answer: A



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19. Match the entries of Column 1 with those of Column 2.

Column 1	Column 2
A. Bicuspid valve	(i) Valve between the right atrium and right ventricle
B. Aortic semilunar valve	(ii) Valve between the right ventricle and pulmonary artery
C. Tricuspid valve	(iii) Valve between the left atrium and ventricle
D. Pulmonary semilunar valve	(iv) Valve between the left ventricle and the aorta

A. A to iii, B to iv, C to i, D to ii`

B. $A \rightarrow ii, B \rightarrow iv, C \rightarrow i, D \rightarrow iii$

C. $A \rightarrow iii, B \rightarrow i, C \rightarrow iv, D \rightarrow ii$

D. $A \rightarrow iv, B \rightarrow iii, C \rightarrow i, D \rightarrow ii$

Answer: A



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20. Identify the process which is not involved in respiration.

A. Gaseous transport

B. Tissue respiration

C. Cellular respiration

D. Circulation

Answer: D



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21. Identify the part that opens into a tube-like structure called trachea.

A. Pharynx

B. Bronchioles

C. Larynx

D. Vocal cords

Answer: C



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22. What are the ligamentous fold-like structures inside the larynx?

A. Trachea

B. Vocal cords

C. Bronchi

D. Bronchioles

Answer: D



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23. Which component present in blood helps in the transport of oxygen as well as carbon dioxide?

A. Haemoglobin

B. Plasma

C. Cytoplasm

D. Heparin

Answer: A



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24. Where is larynx positioned in the respiratory tract?

- A. Between pharynx and trachea
- B. Between bronchi and alveoli
- C. Between trachea and bronchi
- D. Between pharynx and alveoli

Answer: A



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25. What is the form in which oxygen gas is transported from lungs to the bloodstream?

A. Carboamino-haemoglobin

B. Bicarbonate ions

C. Oxyhaemoglobin

D. Glucose

Answer: C



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26. Match the entries of Column 1 with those of Column 2.

Column 1

Column 2

1. Nostril

(A) Carbo amino –
haemoglobin

2. Bronchiole

(B) Pleura

3. Lung

(C) Alveoli

4. Carbon dioxide

(D) Cilia

A. $A \rightarrow iv, B \rightarrow iii, C \rightarrow ii, D \rightarrow i$

B. $A \rightarrow i, B \rightarrow ii, C \rightarrow iii, D \rightarrow i$

C. $A \rightarrow ii, B \rightarrow iii, C \rightarrow iv, D \rightarrow i$

D. $A \rightarrow ii, B \rightarrow iv, C \rightarrow iii, D \rightarrow i$

Answer: A



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Mastering The Concepts Knowledge And Understanding

1. Name the different types of blood vessels.



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2. What are the different types of blood cells?



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3. Write a short note on RBC.



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4. Explain the structure and function of platelets.





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5. What are granulocytes and how are they classified?



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6. How are agranulocytes classified?



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7. What are the chemicals that are secreted by basophils?



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8. What is the main function of eosinophils?



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9. Mention some of the general functions of blood.



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10. Name the two types of valves that are present in the heart.



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11. Write a brief note on the structure of heart.



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12. Draw the structure of heart and label it.



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13. Identify and explain about the pale yellow-coloured component of the blood.



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14. Identify and explain about the type of granu- loocytes that destroy the parasitic

worms.



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15. Explain about the type of agranulocytes that possess cells with mono-lobed nucleus.



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16. Explain about the blood vessel that carries blood away from the heart and transports to the other parts of the body?



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17. Explain about the blood vessel that carries blood from different parts of the body to the heart with the help of a diagram



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18. Explain about the function of the blood vessels that connect arterioles and venules.



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19. Explain about the different valves that help in the flow of blood in human pump.



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20. Name and explain the cardiac cycle in which the atria and ventricles are relaxed during the inflow of blood.



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21. Explain the flow of blood in the cardiac phase where contraction of the blood vessels take place.



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22. Explain about the different pathways by which blood is circulated by the heart.



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23. Complete the table for the arteries and veins through inflow and outflow of blood from heart, kidneys and liver.

Function of the blood vessels	Entering/leaving blood vessels
It carries blood from the upper part of the body.	
It carries oxygenated blood to all the parts of the body	
It supplies oxygenated blood to the liver from the aorta	
It transports the blood from the kidney to the posterior vena cava for its purification	
It carries the deoxygenated blood from the right ventricle to the lungs for purification	



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24. Mention the organs that are involved in the respiratory system.



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25. Write briefly about the pharynx.



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26. What is the frequency of respiration in human beings?



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27. Name the basic processes that are involved in respiration.



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28. Define breathing.



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29. What is meant by tidal volume?



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30. Define the rate of ventilation.



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31. Draw the structure of lungs and label the following parts in it.

(1) Nasal cavity (2) Epiglottis (3) Lungs (4) Larynx and vocal cords (5) Trachea (6) Diaphragm (7) Bronchus (8) Alveoli



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32. Identify the type of respiration in which the glucose undergoes oxidation and also mention where it takes place.



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33. Why food does not enter the respiratory tract when there is a common cavity for both food and air?



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34. Identify and explain about the part of the respiratory system that consists of the cluster of structures that resemble grapes for the exchange of gases.



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35. What do you mean by vital capacity and residual capacity?



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Mastering The Concepts Application And Analysis

1. RBCs have biconcave, disc-like structure and they are tiny and flexible. Give reason.



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2. What is the role of liver in iron homeostasis?



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3. Why does spleen enlarge in a patient suffering from infections due to invasion of pathogens?



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4. What is eosinophilia? How does it occur?



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5. Why do eosinophils turn orange-red in response to eosin, an acidic dye?



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6. Thrombosis is treated with heparin. Give reason.



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7. Neutrophils act as body's natural antibiotics.

Give reason.



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8. What is lymphocytosis? What does this condition generally indicate?



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9. Why monocytes are called scavenger cells?



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10. How does platelets prevent bleeding?



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11. What are myocardium and myocardial infarction?



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12. Why blood from gastrointestinal tract is directly not transported to the heart?



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13. A person with swollen lymph nodes is generally treated with antibiotics. Give reason.



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14. How does carbon monoxide poisoning occur?



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15. Is there any effect of altitude on breathing?
Explain.



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16. We should avoid talking while eating. Give reason.



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17. Why does asthma cause breathlessness?



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18. Why is smoking related to emphysema?



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19. Why does our finger nail turn bluish in cold weather?



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20. What is pleurisy?



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Mastering The Concepts Assertions And Reasons

1. Assertion(A): The heart in human beings is present in a fluid-filled pericardial cavity.

Reason (R): Pericardial fluid transports nutrients to the heart.

A. Both A and R are true and R is the correct explanation for A.

B. Both A and R are true, but R is not the correct explanation for A.

C. A is true and R is false.

D. A is false and R is true.

Answer: C



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2. Assertion(A): The left atrium and the left ventricle are completely separated from the right atrium and the right ventricle.

Reason (R): Oxygenated and deoxygenated blood never mix with each other inside the heart.

- A. Both A and R are true and R is the correct explanation for A.
- B. Both A and R are true, but R is not the correct explanation for A.
- C. A is true and R is false.
- D. A is false and R is true.

Answer: A



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3. Assertion(A): Arteries always carry oxygenated blood.

Reason (R): Arteries transport blood from the heart to different parts of the body.

A. Both A and R are true and R is the correct explanation for A.

B. Both A and R are true, but R is not the correct explanation for A.

C. A is true and R is false.

D. A is false and R is true.

Answer: D



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4. Assertion (A): Systolic pressure is higher than the diastolic pressure.

Reason (R): During diastole, cuspid valves open while during systole semilunar valves open.

A. Both A and R are true and R is the correct explanation for A.

B. Both A and R are true, but R is not the correct explanation for A.

C. A is true and R is false.

D. A is false and R is true.

Answer: B



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5. Assertion(A): Arteries do not collapse, but veins collapse when they are cut through.

Reason (R): Arteries do not have valves whereas veins have valves.

A. Both A and R are true and R is the correct explanation for A.

B. Both A and R are true, but R is not the correct explanation for A.

C. A is true and R is false.

D. A is false and R is true.

Answer: B



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6. Assertion (A): Lack of muscular coordination takes place in the higher altitude.

Reason (R): Proper muscular coordination requires supply of right proportion of oxygen in the muscular tissues.

A. Both A and R are true and R is the correct explanation for A.

B. Both A and R are true, but R is not the correct explanation for A.

C. A is true and R is false.

D. A is false and R is true.

Answer: A



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7. Assertion (A): During inhalation or inspiration, the muscles of the ribs and the diaphragm expand.

Reason (R): Expansion of diaphragm reduces the space in thoracic cavity.

- A. Both A and R are true and R is the correct explanation for A.
- B. Both A and R are true, but R is not the correct explanation for A.
- C. A is true and R is false.
- D. A is false and R is true.

Answer: D



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8. Assertion (A): The expulsion of carbon dioxide occurs due to the increase in pressure in the thoracic cavity.

Reason (R): Exhaled air contains higher percentage of carbon dioxide than normal air.

A. Both A and R are true and R is the correct explanation for A.

B. Both A and R are true, but R is not the correct explanation for A.

C. A is true and R is false.

D. A is false and R is true.

Answer: B



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9. Assertion (A): Oxygen enters the cells in the tissues through the thin walls of the blood capillaries by the process of diffusion.

Reason (R): Diffusion occurs from the region of lower concentration to the region of higher concentration.

- A. Both A and R are true and R is the correct explanation for A.
- B. Both A and R are true, but R is not the correct explanation for A.
- C. A is true and R is false.
- D. A is false and R is true.

Answer: C



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Assessment Tests

1. White blood cells are classified into _____ and _____



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2. _____ is secreted by basophils that help in preventing blood clotting.



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3. Neutrophils engulf the pathogens invaded in our body by the process of _____ .



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4. The main function of lymphocytes is the production of antibodies and thus they provide _____ to our body.



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5. The plasma without fibrinogen is called

_____.



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6. The double-layered membrane that encloses

each lung is called _____



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7. Identify the blood cells that are unique and are the most abundant among all the blood cells.

A. Thrombocytes

B. Erythrocytes

C. Granulocytes

D. Leucocytes

Answer: B



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8. Which of the following is/ are granulocyte(s)?

A. Eosinophils

B. Basophils

C. Neutrophils

D. All the above

Answer: D



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9. Which chemical helps in transmitting the messages from one area of the brain to another?

A. Histamine

B. Heparin

C. Serotonin

D. Both (a) and (b)

Answer: C



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10. What is the lifespan of thrombocytes?

A. 1-2 days

B. 3-5 days

C. 15-20 days

D. 20-25 days

Answer: B



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11. Which artery carries deoxygenated blood from the heart?

- A. Renal arteries
- B. Aorta
- C. Pulmonary artery
- D. Hepatic artery

Answer: C



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12. Name the blood vessels that carry blood to the veins,

A. Venules

B. Capillaries

C. Arterioles

D. Both (a) and (b)

Answer: A



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13. Which substance undergoes oxidation during cellular respiration?

A. Oxygen

B. Carbaminohaemoglobin

C. Glucose

D. Bicarbonate ions

Answer: C



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14. During the process of inhalation, the muscles of the ribs and the diaphragm expand.



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15. The space in the thoracic cavity increases during the exhalation process.



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16. In systole phase, the ventricles expand and the inflow of blood takes place from the heart to the arteries.



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17. Veins carry blood from heart to different parts of the body.



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18. _____ Granulocytes :: Blood : _____



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19. Neutrophils: _____ :: Lymphocytes :



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20. Diastole phase: _____ :: Pulmonary circuit:

Systematic circuit.



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21. Larynx : vocal cords :: bronchioles :



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22. Name the two different apertures present within the heart.



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23. Write about the function of heart.



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24. What is the normal heart beat per minute in a healthy adult?



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25. Write a short note on blood pressure.



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26. What is the hepatic portal system? Explain.



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27. Explain in brief about the lymphatic system.



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28. Explain about the function of lymph nodes.



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29. Write a short note on the organ that disintegrates the old red blood cells.



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30. Explain briefly about the mechanism of respiration.



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31. Explain about tissue respiration.



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Quick Recap

1. How are pulmonary circuit and respiratory process related?



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2. How does the respiratory system in human beings help in speech?



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3. The voice of an adult male and a female is distinguishable. Explain.



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4. Distinguish arteries from veins.



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5. What are the different functions of plasma?



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