

Important Questions Class 11 Biology Chapter 15

Body Fluids and Circulation

1. Which of the four chambers of the human heart has the thickest muscular wall?

Ans: Left ventricle is the thickest muscular wall.

2. Where are RBCs formed from an adult human?

Ans: The bone marrow is used to make RBCs.

3. What is the ECG technique?

Ans: It's a technique for capturing and photographing the numerous electrical variations in the heart's functioning.

4. In which mammal, the RBC are nucleated?

Ans: The nucleus is present in camel red blood cells, which are nucleated and oval in shape rather than spherical.

5. Name any two substances which prevent blood coagulation in uninjured blood vessels.

Ans: Heparin, Antithrombin are the two substances that prevent blood coagulation in uninjured blood vessels.

6. Name the type of granulocytes that play an important role in detoxification?

Ans: Eosinophils play an important role in detoxification.

7. A cardiologist observed an enlarged QR wave in the ECG of a patient. What does it indicate?

Ans: Myocardial infarction is indicated by enlarged Q and R waves .

8. Name the double-layered membranous covering of the heart.

Ans: Pericardium is the double-layered membranous covering of the heart.

9. Why does lymphatic circulation take place very slowly?

Ans: Lymphatic transit is slow because it is not pumped by any organ, such as the heart; instead, it is facilitated by muscle contraction and relaxation. Second, because the lymphatic system is not a closed system, it does not have a high rate of movement.

The squeezing action of surrounding muscles, not the heart, causes lymphatic circulation.

10. Name the instrument used for measuring blood pressure

Ans: Sphygmomanometer is used to measure blood pressure.

11. What is a pace-maker?

Ans: A pace-maker is defined as a patch of cardiac muscle that causes a wave of contractions to start.

12. Why is the SA node called the pace-maker of the heart?

Ans: SA node is termed as the pace-maker of the heart as the SA node is self-excitatory and it causes the heart to contract in a wave.

13. Write the full form of the SA node.

Ans: SA node - Sinoatrial node (Pace-maker)

14. What is the lymph node?

Ans: A lymph node is a specialized component in a lymphatic stream that is responsible for the lymphocytes' filtering of foreign substances.

15. A cardiologist observed an enlarged QRS wave in the ECG of a patient. What does it indicate?

Ans: The QRS wave represents the heart's ventricular contraction, which can be normal or pathological.

16. Name the enzyme that catalyses the formation of carbonic acid in erythrocytes.

Ans: The enzyme carbonic anhydrase catalyses the generation of carbonic acid in erythrocytes.

17. What is systemic circulation?

Ans: The systemic circulation ensures that all body tissues receive adequate blood supply. It transports oxygen and nutrients to the cells while also collecting carbon dioxide and trash.

The type of blood circulation involved is the flow of oxygenated blood from the left ventricle to all body parts and the return of oxygenated blood to the right atrium of the heart.

18. Give two examples of extracellular fluids.

Ans: Interstitial fluid and blood plasma are the examples of extracellular fluids.

19. What name is given to the blood vessels which generally bring blood to an organ?

Ans: Afferent blood vessel is the name given to the blood vessels.

20. Which adrenal hormone accelerates the heartbeat under normal conditions?

Ans: Noradrenalin accelerates the heartbeat under normal conditions.

21. Name the vein that carries blood from the intestine to liver.

Ans: Hepatic portal vein is the blood that carries blood from the intestine to liver.

22. Define cardiac cycle.

Ans: The stages involved in converting deoxygenated blood to oxygenated blood in the lungs and pumping it to the body through the aorta are referred to as the cardiac cycle.

During the conclusion of one heartbeat, a regular sequence of three events occurs: (i) auricular systole, (ii) ventricular systole, and (iii) combined diastole.

23. Name the protein found in RBCs.

Ans: Haemoglobin is found in RCB's.

24. What happens to a person suffering from hemophilia?

Ans: Haemophilia is a condition in which a person's blood lacks clotting factors, resulting in a faulty clotting mechanism. In case of injury the person is at risk of blood loss.

2 Marks Questions

1. Distinguish between mitral and tricuspid valve?

Ans: Difference between mitral and tricuspid valve:

Mitral Valve

Tricuspid Valve

It's known as the bicuspid valve.

It lies in the region of right atrioventricular aperture.

The two flaps are about similar in size.

The size of each of the three flaps varies.

This flap consists of two flaps.

There are three flaps in this flap.

Check the back flow of oxygenated blood into the left auricle.

Check back flow of the deoxygenated blood into right auricle

2. Why does the fish heart pump only deoxygenated blood?

Ans: The fish heart pump only deoxygenated blood because:-

1. All regions of the body send deoxygenated blood to the atrium.
2. It is pushed to the gills after being pumped into the ventricle.
3. Oxygenated blood moves from the gills to other sections of the body.

3. How is heart failure different from heart attack?

Ans: Difference between Heart Failure and Heart attack:-

Heart Failure

Heart Attack

It describes the condition of the heart when it is unable to pump enough blood to meet the body's needs.

It is the condition in which the heart stops beating.

It is often due to congestion of the lungs.

It is caused by a lack of blood flow to the heart.

4. Name the different types of granulocytes. Give the function of the one which constitutes the maximum percentage of total leucocytes.

Ans: Granulocytes come in a variety of shapes and sizes.

(i) Neutrophils – 62%

(ii) Acidophils (eosinophils) – 3%

(iii) Basophils - 0.5% to 1%

Neutrophils are phagocytic, meaning they protect the body from infection.

5. Why is the closed circulatory system considered advantageous?

Ans: For the following reasons, a closed circulatory system is preferred.

1. It maintains a proper high blood pressure, allowing blood to flow at a high velocity, speeding up the supply of essential supplies and the removal of wastes from tissues.
2. The amount of blood flowing to a specific organ or tissue can be adjusted according to the tissue's needs.

6. What is the name of the straw- coloured fluid left after clotting of blood? How is it different from blood?

Ans: The name of the straw- coloured fluid left after clotting of blood is Serum. Serum is plasma lacking coagulation factors. It varies from plasma in that it has far less proteins and is found outside of blood vessels.

7. Why is swelling of feet of leg caused when a person stands immobile for a long time?

Ans: Blood flow to the legs and feet is temporarily limited when a person stands still for an extended period of time. Swelling occurs as a result of the accumulation of fluid in the tissues of the legs and feet. However, when he moves for a brief period of time, the swelling subsides as blood returns to normal circulation in the veins.

8. How are the two heart sounds produced during the cardiac cycle? Which one of these is of longer duration?

Ans: 'Lubb' and 'dupp' are the two heart noises.

- The first heart sound, "lubb," is created when the AV – valves close at the start of the ventricular systole.
- The second heart sound, "dupp," is produced by the closure of semilunar valves at the start of ventricular diastole.

9. What is the average number of thrombocytes in blood? What is their function?

Ans: 1,50,000 to 3,00,000/mm³ is the average number of thrombocytes in blood. The chemicals that are involved in blood coagulation are released.

10. Explain when and how the two sounds of heart are produced?

Ans: The heart makes a distinctive sound at the start and finish of each ventricular systole or contraction.

"lub-dub" is the sound made, with lub being the first of the two. The lub is the sound made when the tricuspid and mitral valves close. The sound made by the aortic and pulmonary valves closing is known as the dub.

11. Define joint diastole. What are the constituents of the conducting system of the human heart?

Ans: Joint diastole is a relaxed state in which all of the heart chambers are relaxed, or diastole, in which the auricles and ventricles are relaxed. Blood from veins enters the relevant auricles in this condition.

The constituents of the conducting system of the human heart are:-

- Sinoatrial node
- Atrioventricular node
- Atrioventricular bundle (bundle of His)
- Purkinje fibres

12. Give the name of various types of formed elements present in the blood.

Ans: Erythrocytes, Lymphocytes, monocytes, neutrophils, eosinophils, basophils and platelets.

3 Marks Questions

1. What is the cardiac cycle?

Ans: The periodic contraction and relaxation of cardiac muscles is known as the cardiac cycle or heartbeat. It is involuntary (automatic). Systole and diastole are the contraction and relaxation of the heart muscles, respectively. In 0.8 seconds, a complete cardiac cycle takes place. Three stages of cardiac cycle are

1. Atrial systole
2. Ventricular systole
3. Joint diastole.

2. Differentiate between right ventricle and left ventricle

Ans: Difference between right ventricle and left ventricle:-

Right Ventricle	Left Ventricle
The right ventricle is smaller than the left.	The left ventricle is larger than the right ventricle.
It has a moderator band in it.	It is missing from the Moderator band.
Columnae carneae are thicker but less intricate than columnae carneae.	Columnae carneae are thinner but more complicated than columnae carneae
Deoxygenated blood is received and pushed.	Blood that has been oxygenated is received and pumped.
It is Crescent shaped	It is Biconvex in shape.
The right ventricle's wall is thinner than the left ventricle.	It has a thicker wall than the right ventricle.

3. Write a note on "Regulation of cardiac activity"?

Ans: Below given pointers states the "Regulation of cardiac activity":-

- (i) Through the autonomic nervous system, the neural centre in the medulla oblongata of the brain can moderate heart function. As a result, it can aid with cardiac regulation.
- (ii) Heart rate, action potential conduction speed, and cardiac output are all reduced by parasympathetic neural signals (a component of the autonomic nervous system).
- (iii) Adrenal medullary hormones help to increase cardiac output (C.O).
- (iv) Sympathetic nerve signals may raise heart rate and the strength of ventricular contraction, as well as cardiac output.

4. Why does lymph contain much less proteins than the blood plasma? Name the two principal lymph vessels in humans.

Ans: The capillary wall is impermeable to bigger molecules like proteins, lymph contains far less protein than plasma. The hydrostatic pressure inside blood capillaries is higher than that in the tissues, causing fluid to leak out. A little quantity of the watery portion of blood plasma escapes into the interstices between the cells, which includes all of the chemicals except the larger proteins.

The right lymphatic duct and the thoracic duct are the two main lymph veins.

5. Differentiate between arteries and veins.

Ans: Difference between arteries and veins:-

Arteries	Veins
These are blood arteries that carry blood away from the heart.	These are blood arteries that go towards the heart.
Blood is pumped through these veins at a high rate.	Blood flows more freely when there is less pressure on it.
Their skin is supple, thick, and muscular.	Thin, non-elastic, fibrous walls

They cannot be collapsed	They can be Collapsible.
They have a tiny hollow.	Cavity is large.
They don't have any valves.	Valves are present.
Jerks in the blood flow.	Blood flows freely

6. Explain the chemical events that take place to form a blood clot to seal the wound?

Ans: Coagulation of blood –

1. When blood leaves a blood vessel, platelets clump together, split apart, and release platelet factors such as thromboplastin.
2. Prothrombin is the starting point for the conversion of prothrombin to thrombin.
3. Thrombin catalyses the conversion of fibrinogen to fibrin, forming a mesh/network in which blood cells become entangled.
4. Ca^{++} ions are required for both preceding procedures.

7. What is stroke volume? What is its relation to cardiac output?

Ans: The volume of blood pumped by the heart during one cardiac cycle or one heart* beat is referred to as stroke volume. Normally, this is 70 mL. The heart beats about 72 times every minute, and cardiac output refers to how much blood is pumped each minute. This is normally in the range of 4900 mL or litres.

8. A person suffering from fever is advised to take a blood test. What may happen to his WBC count and why?

Ans: This person's WBC count may be elevated above the usual range. Because pathogens may be present in his body, the body produces more WBCs to combat them. The WBC count is an effective technique for determining the presence of infection in a sick person.

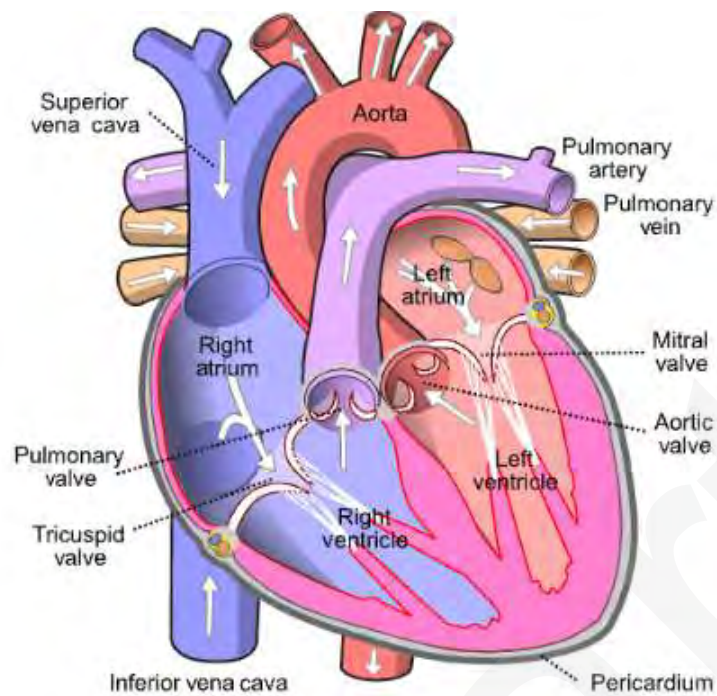
5 Marks Questions

1. Describe the structure of the human heart.

Ans: The heart is a muscular organ that resides above the diaphragm between the two lungs in the thoracic cavity. It's almost in the centre of the chest, inclined to the left at the peak. The pericardium is filled with pericardial fluid and is encased in a double-walled membranous sac. Throughout a person's life, the heart continues to beat without ceasing. In typical circumstances, the heart of an ordinary person beats. When it contracts its forces and pumps blood into arteries that supply blood to body organs, it does so 70 to 80 times each minute. The heart of man and other mammals is a four-chambered structure divided into right and left halves.

Septa fully separate the right and left halves of the heart. The auricle is the top chamber and the ventricle is the lower chamber in each half. An auriculo-ventricular aperture connects each auricle to the ventricle on one side. The two openings are protected by valves that only open into the ventricle and prevent blood from flowing backward. The mitral valve, also known as the bicuspid valve, has two flaps and is located on the left side of the heart, while the tricuspid valve (with three flaps) is located on the right side.

The left ventricle is provided with tendinous cords called chordae tendineae and papillary muscle which prevent the valves from being pushed into auricles when the ventricles contract. The starting point of the aorta at the left ventricle is another set of semilunar valves.



2. What is the lymphatic system? Discuss its importance.

Ans: Lymph is a colourless tissue fluid that resembles blood but lacks haemoglobin and RBCs. In comparison to blood, lymph contains less blood proteins, more of waste matter, increased amount of food material and many WBC's

The tissue fluid is filtered from the blood plasma through the walls of capillaries, and some WBC also emerge from these capillaries. This tissue fluid next enters lymphatic capillaries and is transformed into lymph.

Circulation of Lymph:

Lymph Vessels: Lymph vessels and lymph capillaries can be found in almost every body organ. Lymph vessels contain valves on their walls (like veins).

They form a network in the organs, with one being superficial and the other being deep. The lymph flow in these channels is just one way, from the organs to the organs, but never the other way around. Two major lymph veins can be found in the human body.

Ductus Thoracicus - It begins with a dilatation in the abdominal cavity known as the receptaculum chyli. It then enters the thoracic cavity before exiting to the left of the neck region. Lower extremities, true pelvic area, abdominal region, left upper extremities, left side of the thorax, head, face, and neck all send lymph to it.

Lymph Nodes - Lymph nodes are small globular masses of lymphatic tissue that are grouped in groups from each region of the body. Regional nodes are the names given to the nodes.

Function of Lymph:

- (i) Its purpose is to return interstitial fluid to the bloodstream.
- (ii) It allows macromolecules of plasma proteins to pass through lymph capillaries.
- (iii) It transports digested fat through lacteals in the villi of the intestine.

3. Explain double circulation with the help of a diagram.

Ans: The heart is the organ that pumps blood around the body. It circulates blood through closed channels to numerous body organs. Blood flows from the left ventricle to the aorta, which transports it to the arteries that nourish the body's organs. The superior and inferior vena cava veins return blood from the bodily tissues to the right atrium. Systemic circulation is the term for this sort of circulation.

Blood is pumped from the right ventricle into the pulmonary trunk, which is divided into pulmonary arteries, each of which leads to the lung. Here the blood is oxygenated. The oxygenated blood is returned to the left atrium through pulmonary veins. This is called pulmonary circulation.

