

Class: XI
Subject: Biology
Topic: Body fluids and circulation
No. of Questions: 25

Q1. A cardiologist observes an enlarged QR wave in the ECG of patient? What does this indicate?

Sol. The enlarged QR wave indicates myocardial infraction.

Q2. What is joint diastole?

Sol. During blood circulation, when both the atria and ventricles are in the relaxed phase, it is called joint diastole.

Q3. Define pulse rate. Describe the factors involved in maintaining the pulse pressure.

Sol. The number of times the heart beats in a minute is known as pulse rate. It has been observed that the pulse beats at the same rate as the heart beats. Hence the average pulse rate is 72 beats per minute. The factors involved in maintaining the pulse pressure are as follows:

- (i) The amount of blood in the arteries.
- (ii) The cardiac output.
- (iii) The elasticity of the arterial walls.
- (iv) The viscosity of the blood.

Q4. What transmits the cardiac impulse from the atria to the ventricles?

Sol. Atrioventricular Node (AV Node) collects the wave of contraction generated by SA Node and passes down to ventricles. SA node determines the rate of heart beat, so it is called pacemaker of the heart.

Q5. What is SA nod? Where is it located and what is its function? What is the other name for SA node?

Sol. The sinuauricular node is the point where the heat beat is initiated. It is located near the junction of the superior vena cava and the right auricle. It acts as a pacemaker. The other name for the SA node is the pacemaker or pace setter of the heat.

Q6. Where does the cardiac impulse originate?

Sol. The cardiac impulse originates in the cardiac muscle fibres and is not transmitted to the heart through any nerves. Hence the origin of cardiac impulse is said to be myogenic.

Q7. From which cells do platelets originate? What is their life span? How do they act when blood vessels get injured?

Sol. Platelets are produced from megakaryocytes present in the bone marrow. The life span of platelets is 3 to 7 days only. They are destroyed by phagocytes in the blood. When a blood vessel is damaged, the clotting process is initiated in mammals. They form a plug at which point thromboplastin is secreted. Thromboplastin helps in blood clotting.

Q8. What is haemolysis?

Sol. Haemolysis is the destruction of RBC.

Q9. How are allergies related to the body's immune system?

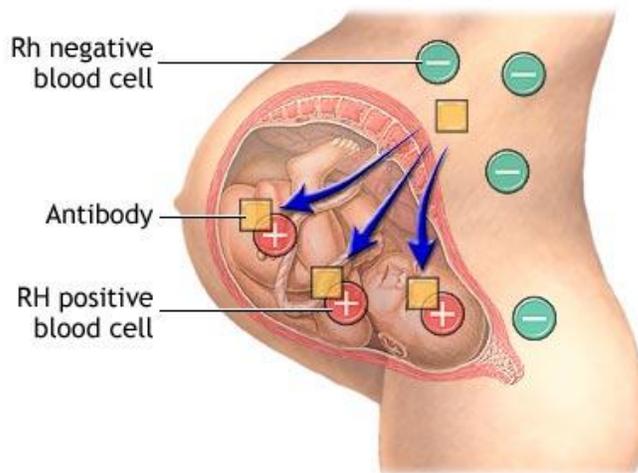
Sol. Allergy occurs when the antigen and antibody reaction takes place inside the tissues. The agent, which causes the allergy is known as an allergen. Allergens trigger the formation of antibodies in the body. If the body's immune system is weak, then enough antibodies are not produced. This makes the body susceptible to various allergies. The first exposure of an allergen to the body does not produce symptoms of allergy but it stimulates the formation of antibodies. But in case of a second exposure, the allergen combines with the antibody-bound mast cells. This reaction causes the cell to burst and subsequently histamine is released causing an inflammatory response.

Q10. RBC of mammals are nucleated or without nucleus?

Sol. RBC of mammals are without nucleus.

Q11. What is Rh factor? In which animal was it first discovered? How is the foetus with Rh-positive blood affected if the mother is Rh-negative?

Sol. Besides A and B, another antigen called Rh factor was found in the erythrocytes of certain persons. The Rh factor was discovered by Landsteiner in Rhesus monkeys. About 85% of the people Rh^+ . They have Rh^+ antigens. Rh factor is expressed by the dominant R gene. Rh positive individuals are RR or Rr, while Rh negative are rr. Disorders may arise as a result of incompatibility of gene products in the blood of newborns and their mothers. The incompatibility may lead to hemolytic disorders in the child and may even be fatal if not



attended to.

If a woman is Rh^- and her husband is Rh^+ , then the child may be Rh^+ . Blood from the foetus may pass into the maternal blood stream and stimulate the formation of antibodies. When the same woman becomes pregnant a second time, some of these antibodies may pass into the child's blood stream and cause clumping of RBC cells. This is called erythroblastosis foetalis. In extreme cases, many red cells are destroyed that the foetus dies before birth. More frequently, it is born alive but dies after birth.

Q12. In which mammal, is the RBC found to nucleated?

Sol. In the camel the RBC is found to be nucleated.

Q13. Name the smallest blood vessel and largest artery in the body.

Sol. Smallest – Capillary,

Largest – Aorta

Q14. Differentiate between erythrocytes and leucocytes.

Sol.

Erythrocytes	Leucocytes
(1) These are called RBCs.	(i) These are called WBCs.
(1) Their number is about 4.5 to 5 million per mm^3	(ii) Their number is about 5000 to 8000 per mm^3
(2) They are red coloured.	(iii) They are colorless.
(3) They are enucleated.	(iv) They are nucleated.
(4) They do not play a role in the defence and immunity of the body.	(v) They play an important role in the defence and immunity of the body.
(5) Their size is about $8-9 \mu\text{m}$.	(vi) Their size is about $11-20 \mu\text{m}$.
(6) They are of one type.	(vii) They are of vie types.
(7) Their life span is for 120 days.	(viii) Their life span ranges from a fe hours to many years.
(8) Cell organelles are mostly absent. E.g. mitochondria are absent.	(ix) Cell organelles are mostly present.
(9) Erythrocytes have haemoglobin.	(x) Leucocytes have no haemoglobin.
(10)They are circular and biconcave in shape.	(xi) They are rounded or amoeboid in shape.

Q15. What happens when the rate formation of lymph exceeds the rates of its return to the blood?

Sol. When the rate of formation of lymph exceeds its return to the blood, it accumulates around the cells causing the swelling of a tissue or organ celled oedema or dropsy.

Q16. Which two organelles other than the nucleus are lacking in a mature mammalian red blood corpuscles?

Sol.

- (i) Mitochondria, and
- (ii) Golgi bodies.

Q17. What is pace setter of the heart?

Sol. SA node (Sinuatrial node).

Q18. What is pulmonary circulation?

Sol. Pulmonary circulation is concerned with the circulation of blood from the heart to the lungs and back to the heart. When the right ventricle contracts, it pumps the deoxygenated blood to the lungs for aeration through the pulmonary artery. The oxygenated blood from each lung is returned to left the auricle by the pulmonary vein

Q19. What is bundle of His?

Sol. AV Node (Auriculo Ventricular Node.)

Q20. What is a cardiac cycle?

Sol. The rhythmic contraction and relaxation of cardiac muscles is known as cardiac cycle or heart beat. It is involuntary. The contraction and relaxation of heart muscles are called systole and diastole respectively. One complete cardiac cycle occurs in 0.8 sec. The three stages of a cardiac cycle are arterial systole, ventricular systole and joint diastole.

Q21. What are the advances of mammalian heart over that of frog's heart?

Sol. A striking development in mammalian heart is the double circulation. Hence the pulmonary and the systematic circulation have different pressure. As such the lungs are saved from the harmful effects of high pressure required by the later circulation. The ventricle is completely divided into two chambers. This ensures the separation of oxygenated and deoxygenated blood.

Q22. Why is a closed circulatory system more efficient than an open circulatory system?

Sol. The closed circulatory system is more efficient due to increase in speed, precision and efficient circulation.

Q23. Name the group of animals which possess blood circulatory system?

Sol. Higher invertebrates and all vertebrates.

Q24. How is the rate of beating of the heart regulated?

Sol. The beating of human heart is regulated by two nerves, one from the brain and the other from the spinal cord. The stimulation of the former decreases the heart beat while that of the later increases the frequency of the heartbeats.

Q25. Why do doctors frequently make a red blood count of patients who are pale and feel tired very soon?

Sol. The patients who are pale and feel tired easily, may be victims of anaemia. Anaemia is a condition in which RBC are not adequately replenished due to improper nourishment. A very severe attack of anaemia may eventually causes death since enough oxygen does not go round the body. To know this the doctors test and make a red blood count of such patients.

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