

Board – ICSE

Class – 10

Topic – Circulatory System

1. Fill in the blanks:

- (i) When oxygen is in fairly high concentration, the hemoglobin quickly combines with it and forms an unstable compound known as _____.
- (ii) The red blood corpuscles are _____ and _____ shaped cells without _____.
- (iii) The _____ is referred to as the graveyard of red blood corpuscles and the _____ referred to as the cradle of red blood corpuscles.
- (iv) The blood vessel leaving the left ventricle of the mammalian heart is the _____.
- (v) _____ are the blood vessels which usually carry oxygenated blood.

Answers:

- (i) Oxyhaemoglobin.
- (ii) Biconcave, disc and nucleus.
- (iii) Spleen and bone marrow
- (iv) Left aorta.
- (v) Arteries

2. True or false. If false rewrite the wrong statement in its correct form:

- (i) R.B.Cs are of several kinds whereas WBCs are of one kind.
- (ii) The average life of red blood cells in our body is about 120 hours.
- (iii) The heart of a normal human adult beats more than one lakh times per day.
- (iv) The walls of auricles are thicker than those of ventricles.

Answers:

- (i) False, RBCs are of one kind whereas WBCs are of several kinds.
- (ii) False, the average life of a red blood cell in our body is about 120 days.
- (iii) True
- (iv) False, the walls of auricles are thinner than those of ventricles.

3. Match the column:

Column A

- (i) Coronary artery
- (ii) Inferior vena cava
- (iii) Superior vena cava
- (iv) Pulmonary vein
- (v) Coronary veins

Column B

- (a) Collects deoxygenated blood from lower parts.
- (b) Brings oxygenated blood from lungs.
- (c) Collect deoxygenated blood from the wall of the heart.
- (d) Carry oxygenated blood to heart muscle.
- (e) Collects deoxygenated blood from upper part.

Answers:

- (i) (d), (ii) (a), (iii) (e), (iv) (b), (v) (c)

4. State the location:

- (i) Hepatic portal vein
- (ii) Sino-auricular node
- (iii) Semilunar valves of the heart
- (iv) Bundle of His
- (v) Pulmonary vein

Answers:

- (i) It is located between alimentary canal and liver.
- (ii) It is a special kind of muscle located in the heart.
- (iii) Located in the arteries leaving the heart.
- (iv) Arises from atrio ventricular node, moves along inter-ventricular septum to the apex of ventricle and then radiates upwards.
- (v) Arises from lungs and pours blood into the left auricle.

5. State the function:

- (i) Semilunar valves of the heart.
- (ii) Pericardium
- (iii) W.B.C.
- (iv) Chordae tendinae
- (v) Vena cava

Answers:

- (i) They prevent the back flow of blood from the pulmonary artery and aorta into the heart.
- (ii) It protects the heart.

- (iii) To fight against microorganism by producing antibodies.
- (iv) To keep the cuspid valves in position.
- (v) To carry deoxygenated blood from the body parts to the right auricle of the heart.

6. Choose the odd one out:

- (i) Systolic pressure, Diastolic pressure, Stethoscope, Sphygmomanometer.
- (ii) Artery, Vein, Portal vein, Lacteal.
- (iii) Purkinje fibers, A. V. node, A. V. valve, S. A. node.
- (iv) Human heart, Fish heart, Reptile heart, Toad heart.
- (v) Mitral valve, Tricuspid valve, Semilunar valve, Venous valve.

Answers:

- (i) Stethoscope
- (ii) Lacteal
- (iii) A. V. valve
- (iv) Fish heart
- (v) Venous valve

7. Multiple choice questions:

(i) The chief function of lymph nodes in mammals is to:

- a) Produce WBC's
- b) Produce hormones
- c) Destroy old RBC's
- d) Destroy pathogens

(ii) Agranulocytes are:

- a) Lymphocytes, monocytes
- b) Lymphocytes, basophils
- c) Eosinophils, basophils
- d) Eosinophil, monocytes

(iii) The beating of the heart of man is hear on the left side, because:

- a) The left vent ride is towards the left side
- b) Both the ventricles are towards the left side
- c) Contraction of heart is powerful on left side.
- d) The dorsal aorta is on the left side

(iv) What is blood pressure?

- a) The pressure of blood on the heart muscles
- b) The pressure of blood exerted on the walls of arteries and veins
- c) The pressure of blood on the walls of veins only
- d) The pressure of blood on the walls of arteries only

Answers:

- (i) Destroy pathogens
- (ii) Lymphocytes, monocytes
- (iii) Contraction of heart is powerful on left side.
- (iv) The pressure of blood exerted on the walls of arteries and veins

8. Give technical terms:

- (i) The artificial method of filtering the blood or removing the wastes from the blood.
- (ii) The respiratory pigment contained in human blood.
- (iii) An unstable bright red compound formed between hemoglobin and oxygen to carry the oxygen to the body cells.
- (iv) The phase of cardiac cycle in which the auricles contract.
- (v) Name the vein in the human body which carries oxygenated blood.

Answers:

- (i) Dialysis
- (ii) Hemoglobin
- (iii) Oxyhaemoglobin
- (iv) Atrial systole
- (v) Pulmonary vein

9. Name the following:

- (i) The fine blood vessels in the tissues through which exchange of materials occurs
- (ii) The blood vessel leaving the left ventricle of the mammalian heart.
- (iii) The enzyme which converts fibrinogen to fibrin.
- (iv) Blood cells which protect the human body from invading bacteria.
- (v) The study of blood vascular system including arteries, veins and heart.

Answers:

- (i) Capillaries
- (ii) Dorsal aorta

- (iii) Thrombokinase
- (iv) W.B.C
- (v) Angiology

10. Explain the terms:

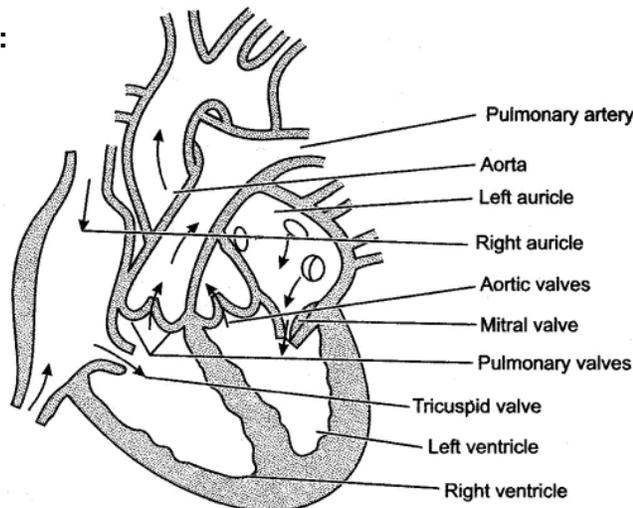
- (i) Electrocardiogram (ECG)
- (ii) Hepatic Portal System
- (iii) Blood Pressure

Answers:

- (i) Electrocardiogram is the recorded report of an electrocardiograph which is produced by the heart muscle during the cardiac cycle of contraction and relaxation.
- (ii) Systems of veins carrying blood capillaries of intestine to liver in mammals are called hepatic portal system. The blood from the intestine carries digested carbohydrates and proteins, i.e., glucose and amino acids to the liver which converts them into glycogen and urea respectively.
- (iii) When the blood flows in the artery it exerts a pressure on the elastic wall of the artery which is called blood pressure. It is greater during systole (contraction) than during diastole (relaxation) of the heart. In a normal adult the blood pressure is 120/80 where systolic is 120 and diastolic pressure is 80 mm of Hg (mercury).

11. Position of valves in human heart.

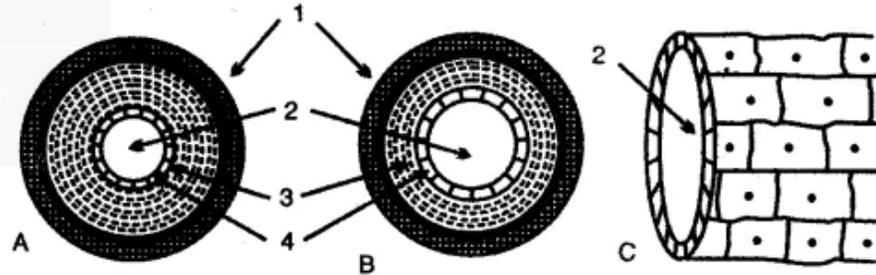
Answers:



12. The figures given below are cross-sections of blood vessels.

- (i) Identify the blood vessels A, B and C.

- (ii) Name the parts labeled 1-4.
- (iii) Mention two structural differences between A and B.
- (iv) Name the type of blood A that flows (a) through A, (b) through B.
- (v) In which of the above vessels referred to in (iv) above does exchange of gases actually take

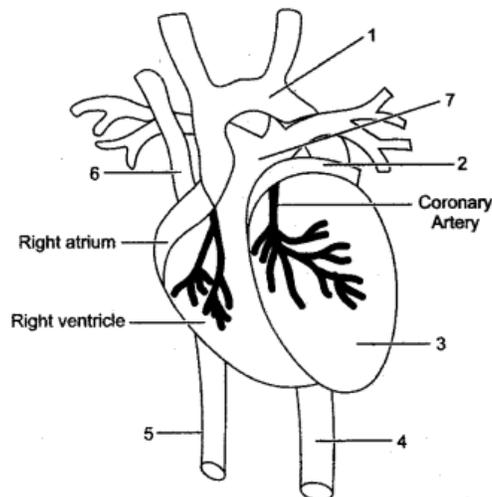


Answers:

- (i) (A) Artery, (B) Vein, (C) Capillary.
- (ii) 1. Connective tissue, 2. Lumen, 3. Tunica media, 4. Tunica intima/Endothelium.
- (iii) Two structural differences between arteries and veins are :
 - (a) Arteries are thick-walled and veins are thin walled.
 - (b) There are no valves in arteries while valves are present in veins.
- (iv) (a) Oxygenated blood flows through A. (b) Deoxygenated blood flows through B.
- (v) The exchange of gases takes place in C capillaries.

13. Given alongside is a diagram of the external features of the heart.

- (i) Name the parts '1' to '7'.
- (ii) What happens if the coronary artery gets an internal clot?
- (iii) Which type of blood does part '5' carry?
- (iv) Mention one structural difference between part '5' and '4'.



Answers:

- (i) 1. Aorta, 2. Left atrium, 3. Left ventricle, 4. Dorsal aorta, 5. Inferior vena cava, 6. Superior vena cava, 7. Pulmonary artery.
- (ii) If the coronary artery gets an internal clot, the corresponding part of the heart does not get its blood supply. This will result in loss of contraction or even death of the cardiac cells resulting in a heart attack or coronary arrest which may prove to be fatal.
- (iii) Part '5' which is the inferior vena cava carries deoxygenated blood which is rich in CO₂ and metabolic wastes.
- (iv) Part '5' is more muscular and lumen is narrow while part '4' is less muscular and lumen is wider.

14. Differentiate between Blood and Lymph:

Answers:

Blood	Lymph
(i) Blood contains plasma, RBCs, WBCs and platelets.	Lymph contains only the soluble parts of plasma.
(ii) It contains albumin, globulin and fibrinogen.	It does not contain these substances.
(iii) It is an alkaline red coloured fluid.	It is a colorless fluid resembling blood in other respects.

15. Differentiate between Blood plasma and Serum.

Answers:

Blood plasma	Serum
It is transparent fluid part of blood that contains blood corpuscles, fibrinogen and prothrombin.	It is a transparent fluid secreted from blood clot that does not contain blood corpuscles, fibrinogen and prothrombin.

Give Reasons:

16. Why is circulatory system also known as transport system?

Answers:

The circulatory system is also known as transport system because it carries various substances from one organ to another.

17. Why is it necessary to know the blood groups before giving transfusion of blood?

Answers:

In blood transfusion, it is necessary that the kind or the type of blood to be transfused should be matched with the type of blood of the receiving person. Otherwise, the RBC of the donor blood will stick to each other and block the passage of blood vessels of the receiver leading to death. Hence, it is necessary to know the blood groups before transfusion of blood.

18. State any five functions of blood.

Answers:

- (i) It transports oxygen from lungs to body tissues.
- (ii) It transports carbon dioxide from the tissues to the lungs partly in combination with hemoglobin and partly as solution in blood plasma.
- (iii) It transports digested food to different organs of the body which is utilized by cells.
- (iv) It helps in keeping the temperature of the body uniform by distributing heat.
- (v) It forms a clot wherever there is a cut in a blood vessel. The clot not only prevents further loss of blood but also prevents the entry of disease germs.

19. Describe the role of lymph.

Answers:

- (i) Transport of nutrients and oxygen to the cells and tissues.
- (ii) Removal of CO₂ and nitrogenous wastes from the tissues and carry them to the blood.
- (iii) It absorbs fatty acids and glycerol through lacteals.
- (iv) It destroys harmful pathogens by its lymphocytes.
- (v) It maintains body temperature.
- (vi) It regulates protein level in the tissue fluid.

20. Name the blood vessels entering the heart and leaving the heart.

Answers:

Blood Vessels entering the heart: The right atrium receives two large vessels :

- (i) Anterior vena cava
- (ii) Posterior vena cava

Blood Vessels leaving the heart: Arising from the ventricle are two large blood vessels :

- (i) The pulmonary artery
- (ii) The aorta

The coronary arteries arising from the base of aorta.