Section A

I. Multiple Choice Questions:

1. Which of the following blood vessels carry oxygen-rich blood from the lungs to the heart?

a) Pulmonary artery b) Pulmonary vein

c) Aorta d) Vena cava

2. What is the function of platelets in the blood?

a) To carry oxygen b) To fight infections

c) To help in blood clotting d) To transport carbon dioxide

3. Which type of blood vessel is responsible for carrying oxygen and nutrients to the body's tissues?

a) Arteries b) Veins c) Capillaries d) Lymphatic vessels

4. Which blood component helps in fighting infections?

a) Red blood cells b) White blood cells

c) Plasma d) Platelets

5. What is the name of the large artery that carries oxygenated blood from the heart to the body?

a) Pulmonary artery b) Carotid artery

c) Aorta d) Jugular vein

6. Which of the following statements is true regarding veins?

a) They carry blood away from the heart

b) They carry oxygen-rich blood

c) They have thick, muscular walls

d) They have valves to prevent backflow of blood

7. The process by which oxygen and carbon dioxide are exchanged between blood and tissues is called:

a) Circulation b) Respiration c) Diffusion d) Filtration

8. The right atrium receives blood from which of the following?

a) Pulmonary vein b) Aorta c) Vena cava d) Pulmonary artery

9. Which of the following is the correct pathway for the blood flow in the heart?

a) Right atrium → Right ventricle → Pulmonary artery → Lungs → Left atrium → Left ventricle → Aorta

b) Right atrium → Left atrium → Left ventricle → Aorta → Pulmonary artery → Lungs

c) Left atrium → Left ventricle → Pulmonary artery → Lungs → Right atrium → Right ventricle

d) Right atrium → Pulmonary vein → Left atrium → Left ventricle → Aorta → Body

10. What is the name of the liquid component of blood that helps in transporting nutrients, hormones, and waste products?

a) Red blood cells b) Plasma

c) Platelets d) White blood cells

11. Which of the following blood vessels carries deoxygenated blood from the heart to the lungs?

a) Aorta b) Pulmonary artery c) Pulmonary vein d) Carotid artery

12. What is the function of the septum in the heart?

a) To separate oxygenated and deoxygenated blood

b) To pump blood into the lungs

c) To produce heartbeats

d) To regulate blood pressure

13. Which of the following is a characteristic of capillaries?

a) They have thick muscular walls

b) They carry oxygen-rich blood

c) They are the site of exchange of gases and nutrients

d) They have valves to prevent backflow of blood

14. Which of the following is true about the pulmonary circulation?

a) It circulates blood between the heart and the lungs.

b) It supplies blood to the body’s organs.

c) It is responsible for delivering oxygen to the heart.

d) It moves blood only through arteries.

15. Which of the following structures in the heart controls the flow of blood between the left atrium and the left ventricle?

a) Tricuspid valve
b) Pulmonary valve
c) Aortic valve
d) Bicuspid valve (Mitral valve)

16. What is the primary function of the coronary arteries?

a) To supply blood to the brain
b) To supply oxygenated blood to the heart muscle
c) To carry blood from the heart to the lungs
d) To remove waste products from the body

17. The "lub-dub" sound of the heartbeat is caused by:

a) The closing of the heart valves
b) The flow of blood through the arteries
c) The contraction of the heart muscles
d) The pumping of blood into the veins

18. What is the name of the large vein that carries deoxygenated blood from the lower part of the body to the heart?

a) Jugular vein b) Pulmonary vein c) Superior vena cava d) Inferior vena cava

19. What is the function of the tricuspid valve in the heart?

a) To prevent the backflow of blood from the left ventricle to the left atrium
b) To prevent the backflow of blood from the right ventricle to the right atrium
c) To regulate blood pressure
d) To pump blood into the lungs

20. What is the role of the heart's pacemaker?

a) To regulate the flow of blood into the lungs
b) To produce red blood cells
c) To generate electrical impulses that control the heartbeat
d) To filter waste from the blood

21. What is the process of blood clotting called?

a) Hemostasis b) Hemophilia c) Oxygenation d) Diffusion

22. Which of the following blood components is responsible for clotting?

a) Plasma b) Red blood cells

c) Platelets d) White blood cells

23. Which of the following occurs when the heart contracts?

a) The atria fill with blood b) Blood is pumped from the heart into the arteries

c) Blood enters the heart from the veins d) The heart relaxes to receive blood

24. The heart is located in which cavity of the body?

a) Thoracic cavity b) Abdominal cavity c) Pelvic cavity d) Cranial cavity

25. What is the function of the aortic valve in the heart?

a) To prevent the backflow of blood into the left atrium

b) To regulate the flow of blood into the aorta

c) To prevent the backflow of blood into the left ventricle

d) To regulate the flow of blood into the pulmonary artery

26. Which of the following statements is true about blood pressure?

a) It is lower in arteries than in veins b) It is higher in veins than in arteries

c) It is higher in arteries than in veins d) Blood pressure is the same in all blood vessels

27. Which of the following helps to maintain the blood flow during the relaxation phase of the heart?

a) Capillaries b) Valves in veins c) Arteries d) Aorta

28. What is the correct sequence of blood flow through the heart starting from the body?

a) Right atrium → Left atrium → Right ventricle → Left ventricle

b) Right atrium → Right ventricle → Left atrium → Left ventricle

c) Left atrium → Right atrium → Left ventricle → Right ventricle

d) Left ventricle → Right atrium → Left atrium → Right ventricle

29. Which of the following does NOT carry blood?

a) Arteries b) Veins c) Lymph vessels d) Capillaries

30. The heart has two main pumps. The left side pumps blood to the _____.

a) Lungs b) Heart c) Kidneys d) Body

31. Which of the following diseases is caused by the narrowing of arteries?

a) Hypertension b) Atherosclerosis c) Anemia d) Leukemia

32. Blood group A has

a) antigen A and antibody B b) antigen B and antibody B

c) antigen A and antibody A d) antigen B and antibody A

Section B

II. Reasoning Questions

Q1. Why do arteries have thicker walls than veins?

Q2. Explain why the left ventricle has thicker walls than the right ventricle.

Q3. Why does the heart have a septum? What is its importance?

Q4. Why are capillaries the most important type of blood vessels for nutrient and gas exchange?

Q5. Why do veins have valves, but arteries do not?

Q6. Why is it important that blood from the lungs is delivered to the left side of the heart rather than the right?

Q7. Why do we need to have both systemic and pulmonary circulations in the body?

Q8. Why are white blood cells important in the circulatory system?

Q9. During surgical operations or during accidents, the patient may be given blood from outside to save his life. What is the technical name of this process ? Briefly explain the precautions to be observed and taken in this process.

Q10. Amit and Ankita's friend Navin is in need of blood for a surgery. Navin's blood test indicates that he has antibodies A and B but no antigen at all. Ankita's blood is found to be O- while Amit's blood is AB+. Find Navin's blood group and say who qualifies as his blood

Q11. The ventricles have thick muscular walls whereas the auricles have thin walls. Why do you think thick muscular walls are necessary in the ventricles and not in the auricles?

Section C

III. Short answer question:

Q1. The path that the blood flows through during pulmonary circulation is:

1. RA → RV → Pulmonary arteries → Lungs → Pulmonary veins → LA
2. LA → LV → Pulmonary veins → Lungs → Pulmonary arteries → RA
3. LA → LV → Aorta → Body → Vena Cava → RA
4. RA → RV → Vena Cava → Body → Aorta → LA

Q2. The scientist identified different types of blood groups.

Q3. Name the four blood groups based on antigens.

Q4. Name the three principal fluids of the human body.

Q5. Define Lymph.

Q6. Define Artificial pacemaker.

Q7. Write important role/roles of Pericardial fluid.

Q8. Give the functions of lymph.

Q9. Explain — (a) Universal donor (b) Universal recipient

Q10. What is normal blood pressure in an adult?

Q11. Define Palpitation

Q12. Define Hypertension

Q13. What is double circulation?

Q14. Difference between Blood and Lymph

Q15. Given below is a table showing blood groups and their transfusion compatibility. Complete the table by filling in the blanks numbered 1 to 6.

Blood group	Can donate blood to	Can receive blood from
1	A and AB	2
B	3	4
AB	5	AB, A, B and O
O	A, B, O and AB	6

Q16. Match the following terms with their correct locations:

Column A	Column B
1. Left Ventricle	A. Between right atrium and right ventricle.
2. Right Atrium	B. Pumps oxygenated blood to the body.
3. Tricuspid valve	C. Between left atrium and left ventricle.
4. Bicuspid valve	D. Receives deoxygenated blood from the body.
5. Aortic valve	E. Prevents backflow of blood from the left ventricle into the left atrium.

Section D

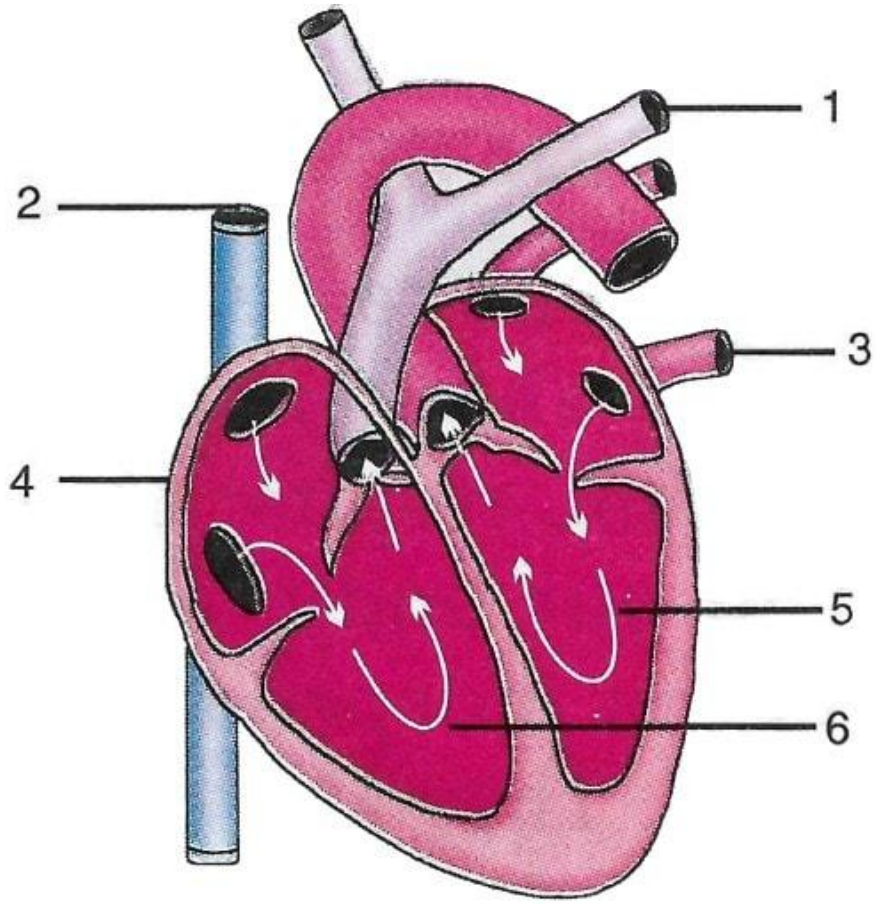
IV. Long Answer Questions

Q1. Explain the process of blood circulation in the body with the help of a schematic diagram.

Q2. Why is a person with blood group O called a universal donor and a person with blood group AB called a universal recipient?

V. Picture Study

Q1. Alongside is a diagram of the human heart showing its internal structure. Label the parts marked 1 to 6, and answer the following questions.



(a) Which type of blood is carried by the blood vessel marked 2?

(b) Name the main artery that takes the blood from the heart to different parts of the body.

(c) Which chamber of the heart receives deoxygenated blood from the body?