



BOARDS & BASICS



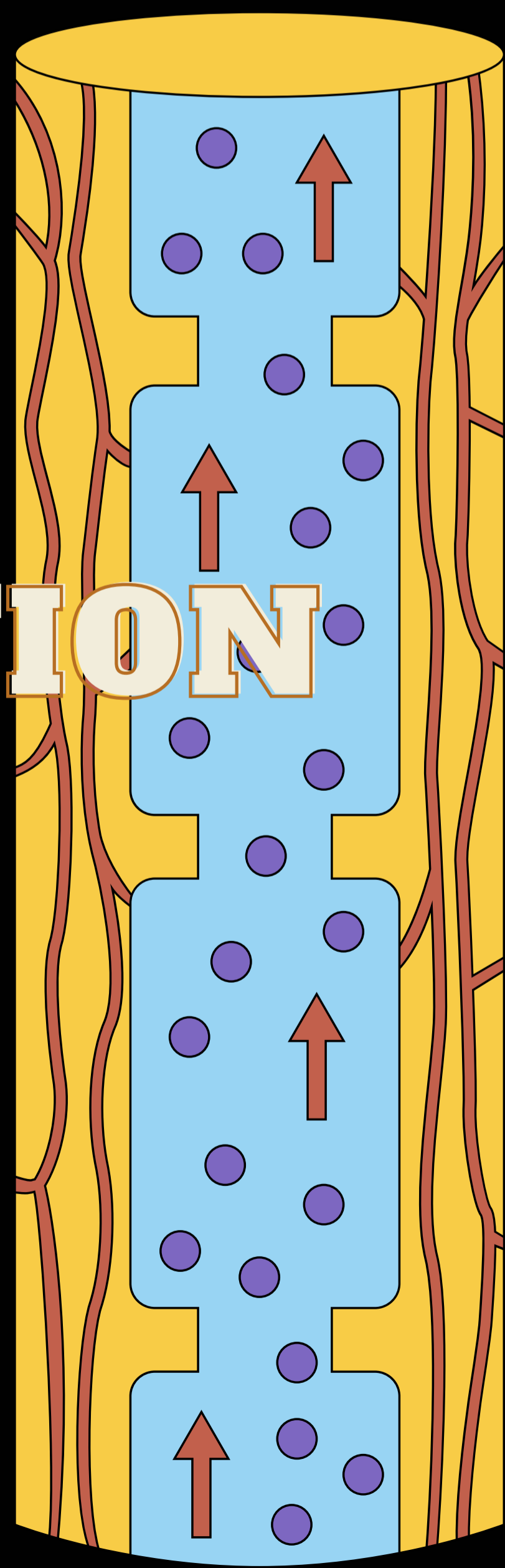
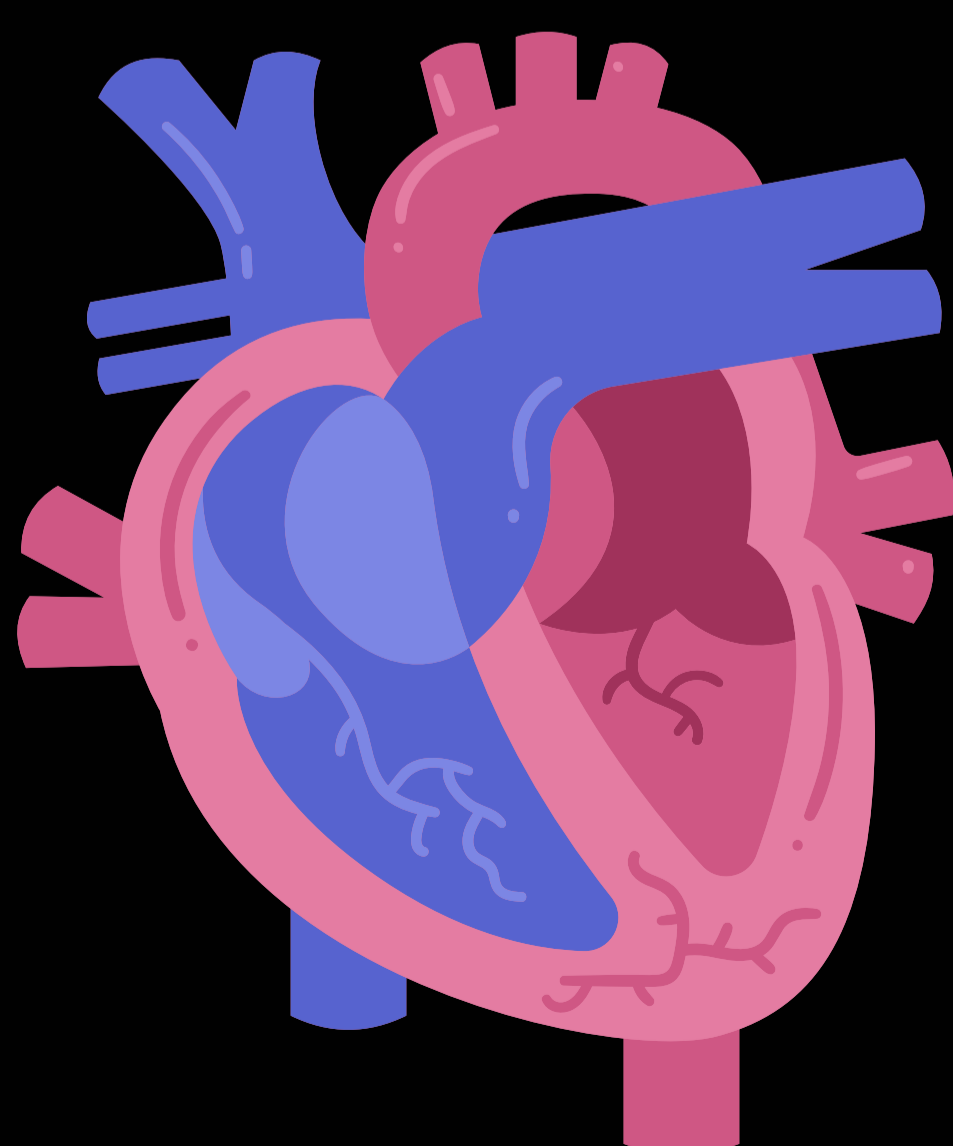
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CLASS NOTES!

TOPIC

TRANSPORTATION



★ TRANSPORTATION

→ In all living organism, various types of substances are transported to one part of the body to another.

The chief substance which are transported are nutrients, H_2O , respiratory gases ($O_2 + CO_2$), metabolic wastes, hormones etc.

- In animals the transportation is done by Circulatory system.

- In plants the transportation is done by

Vascular Tissues

TRANSPORTATION IN HUMAN BEINGS

→ In human transport of metabolites occur via two stage -

A) Blood vascular system

↓
Composed
of

↓
CIRCULATORY FLUID

① BLOOD

↓
PUMPING ORGAN

② HEART

↓
PATHWAY

③ Blood vessels

B) LYMPHATIC SYSTEM

① LYMPH

② LYMPHATIC VESSELS

③ LYMPH NODES

BLOOD

→ PLASMA (55%)

H₂O - (90% - 92%) - major component
 organic substance - nutrients, plasma protein, N-waste, Hormones
 Inorganic substance - O₂, CO₂ & N₂ (trace)

→ BLOOD CELLS (45%)

① RBC (Erythrocyte)

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- Red due to presence of Haemoglobin.

② WBC (Leucocyte)

- colourless to types of defence cells.

- engulf germs produced

- Produce antibodies

- cleans dead cells.

- carry O₂ from lung to tissue

- carry CO₂ from tissue to lung

→ PLATELETS (Thrombocytes) ③

- small cell fragments

- Helps in blood clotting.

Function of Blood

1) Transport - of O₂, CO₂, nutrient, N-waste, enzymes etc.

2) Homeostasis - thermoregulation, osmotic BALANCE, PH balance

3) DEFENCE - Protection from germs.

4) BLOOD circulation: stops bleeding.

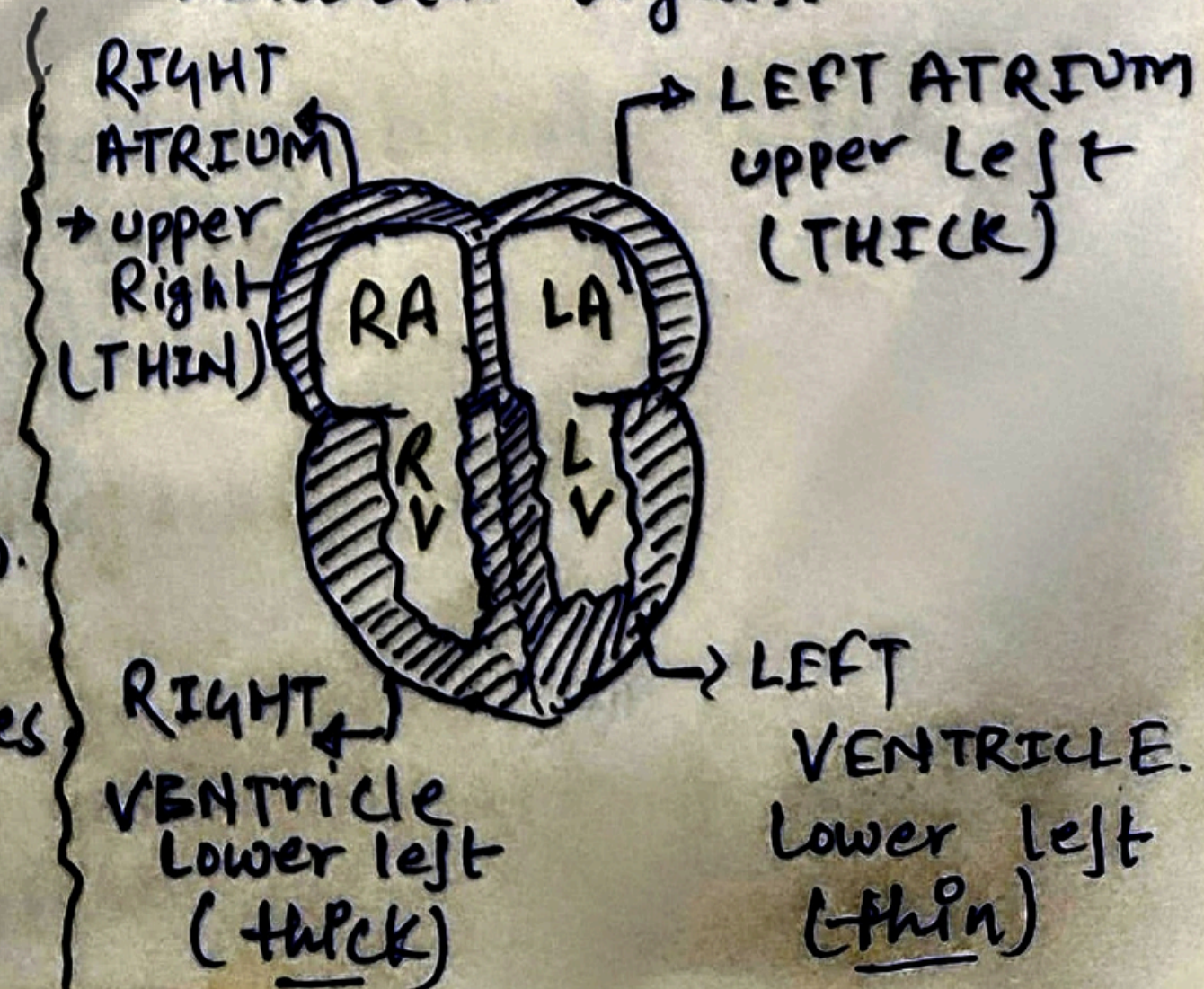
- Oxygenated Blood → Bright scarlet RED
- Deoxygenated Blood → PURPLISH RED
- RBC & Platelets do not have nucleus.
- Each haemoglobin molecule is red due to presence of Iron & carry O₂ molecule.

HEART - MAIN PUMPING ORGAN

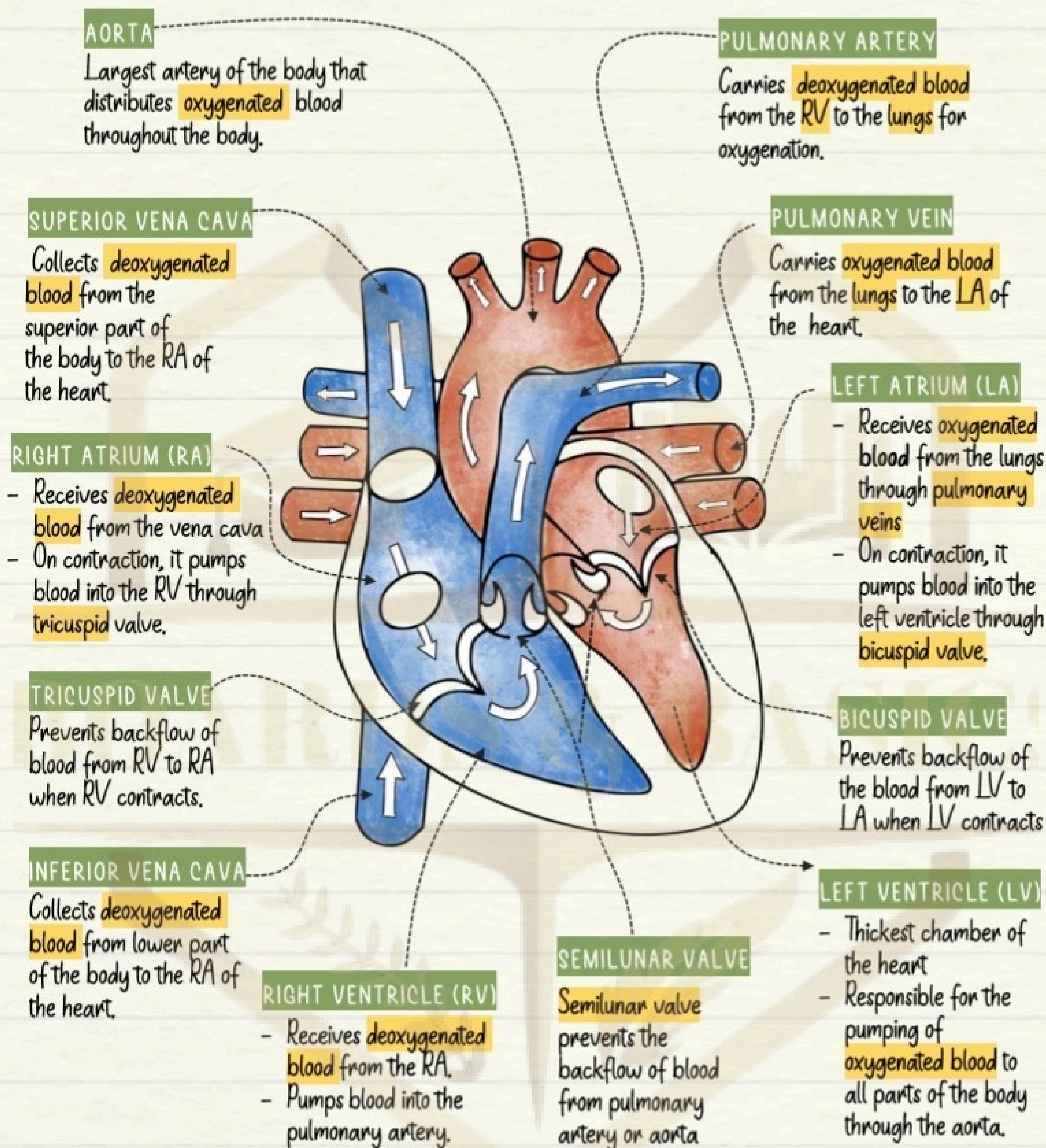
FEATURE

- Location - In chest cavity
- Shape - Pyramidal / conical
- Size - closed fist (12x9x6 cm)
- weight - 300 gm (M), 250 gm (F)
- Protection - Double covering - pericardium.
- Heart wall - made of cardiac muscles

→ four chamber hollow muscular organ.

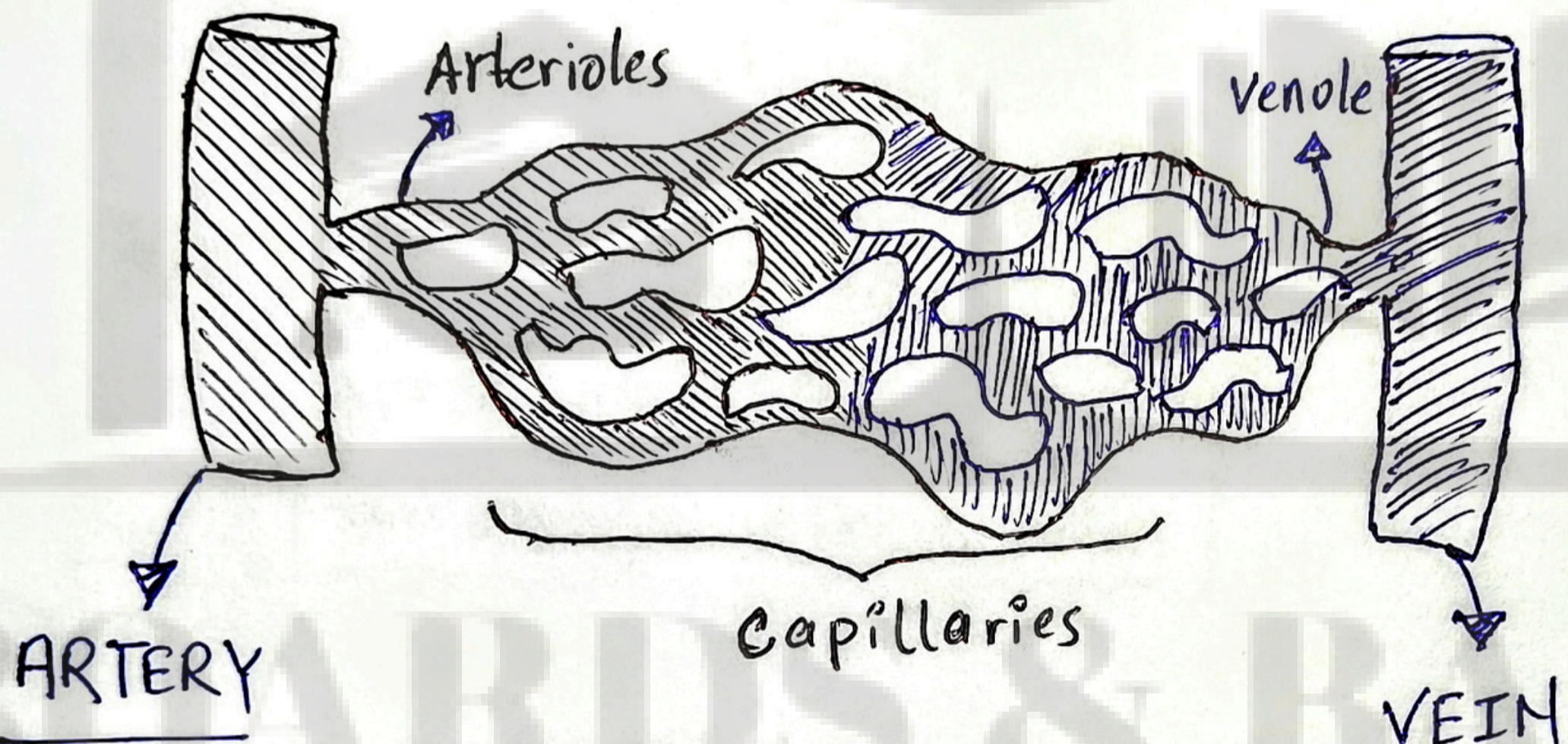
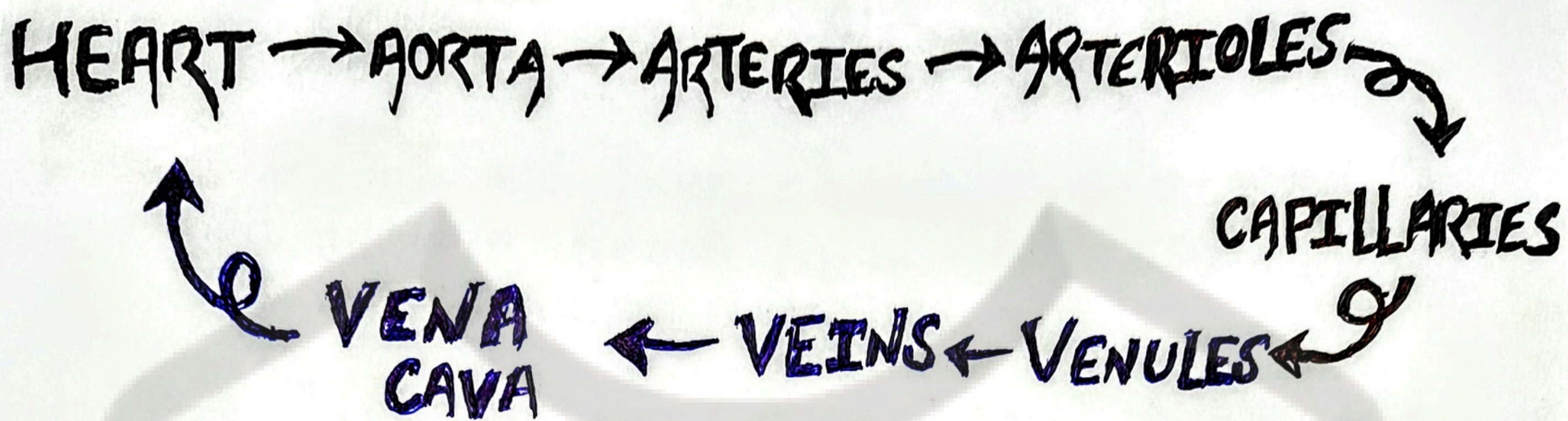


HEART



- ★ Part of the body that lies above heart - Superior
- ★ Part of the body that lies below heart - Inferior

BLOOD VESSEL



- Carries blood away from heart
- Blood flows under high pressure
- Has thick elastic wall
- Does not have valves
- Carries oxygenated blood except pulmonary artery

- Carries blood towards the heart
- Blood flows under Low Pressure
- Has thin inelastic wall
- Has valve to prevent backflow of blood
- Carries deoxygenated blood except pulmonary vein.

Blood pressure

→ ~~The pressure~~ The Pressure exerted by blood on the walls of the blood vessels.

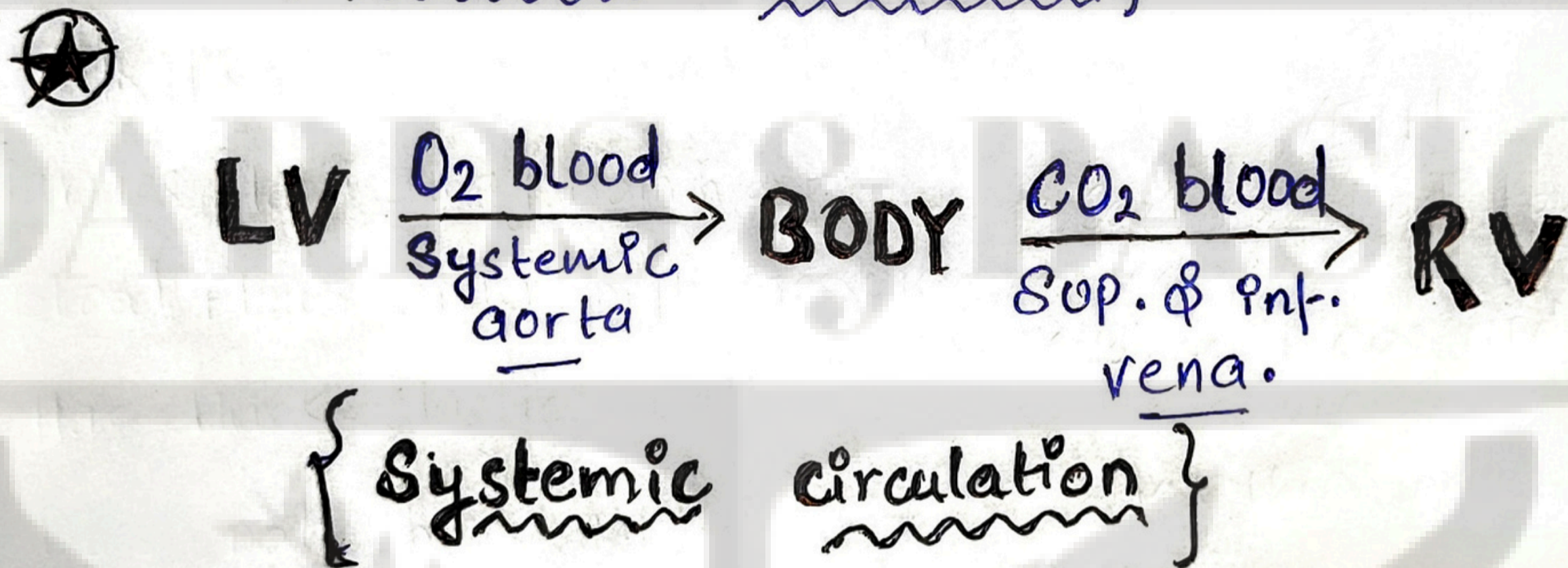
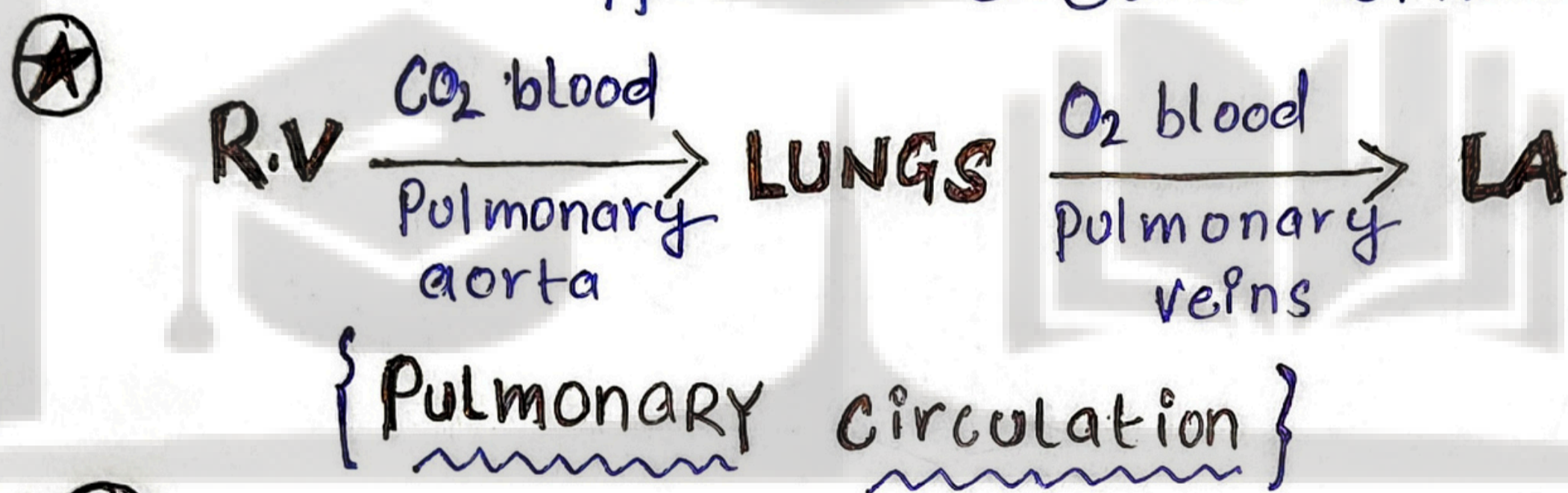
→ Normal blood pressure.

120 Systolic pressure
Pressure of blood on wall of artery during ventricle contraction.

80 Diastolic pressure.
The pressure of blood on walls of artery during ventricle relaxation.

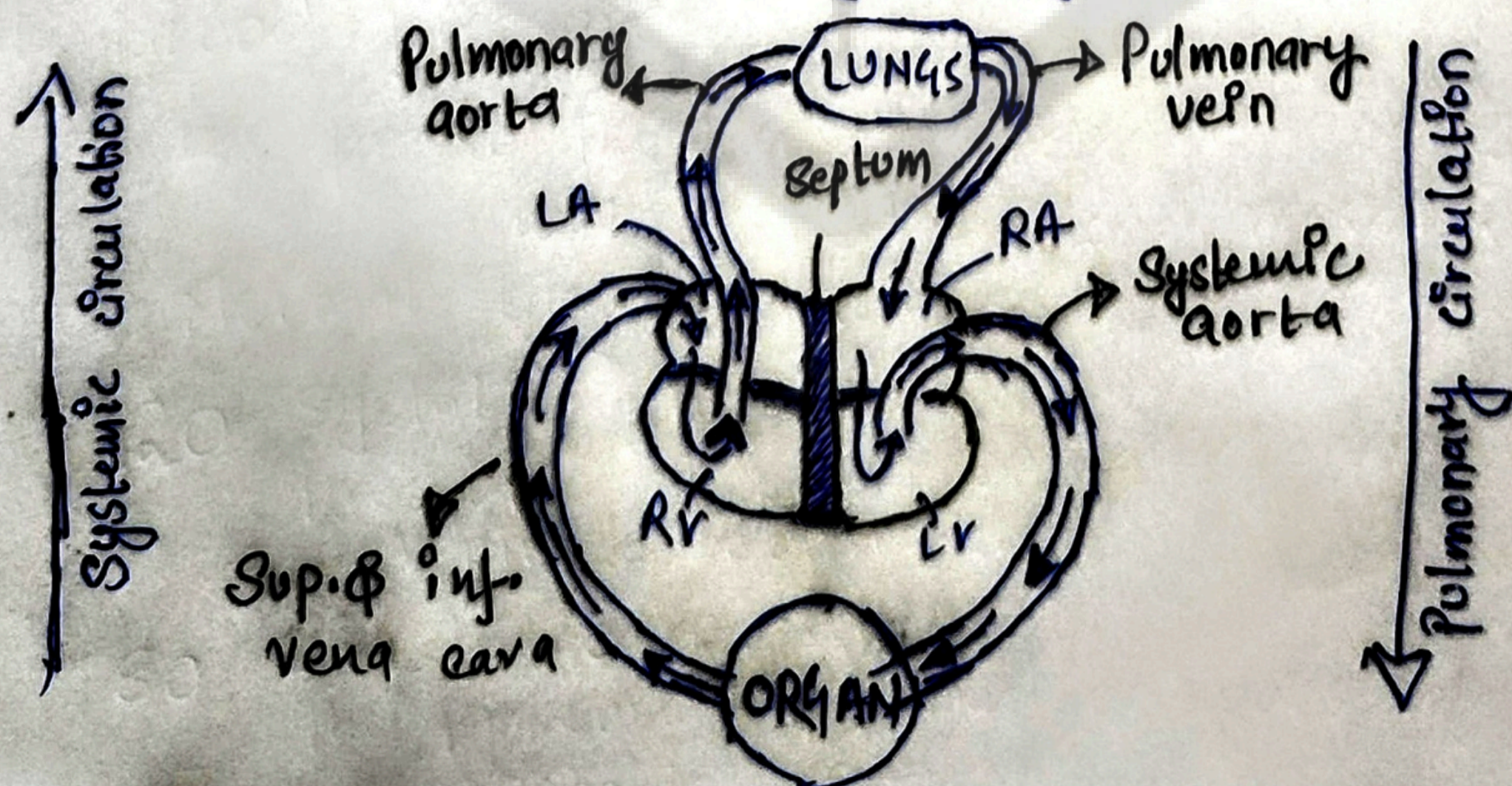
BLOOD CIRCULATION

- CLOSED TYPE - Blood never flow out of system of blood vessels and hearts.
- Complete TYPE - All four chamber are separate by septum hence O_2 blood & CO_2 blood do not mix.
- Double TYPE - O_2 blood & CO_2 blood flows via 2 different circuits without mixing.



★ DOUBLE CIRCULATION

→ means → Pulmonary & Systemic circulation together.

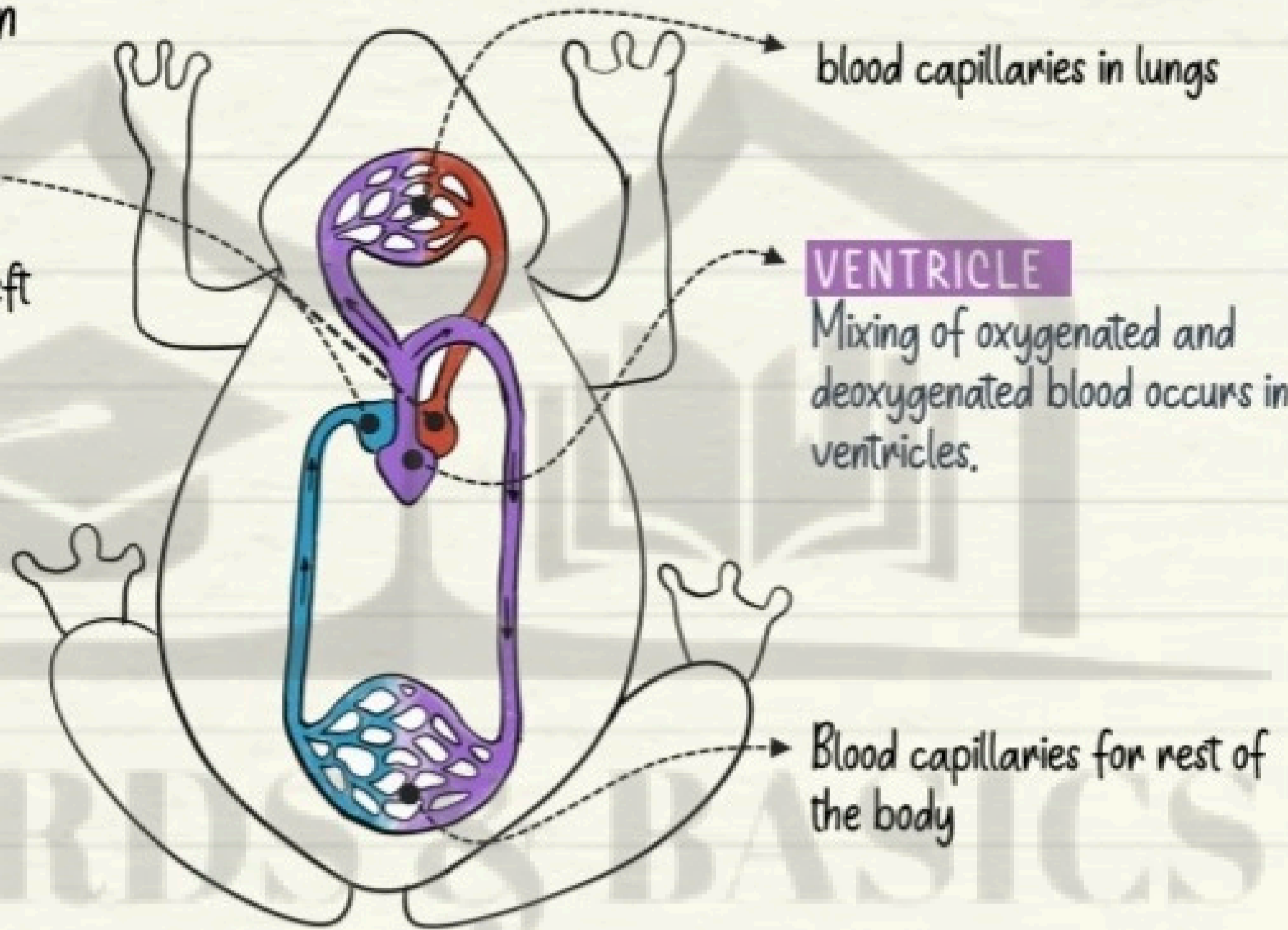


Circulatory system of amphibians and reptiles

- ★ Three chambered heart
- ★ Double circulation

TWO ATRIUMS:

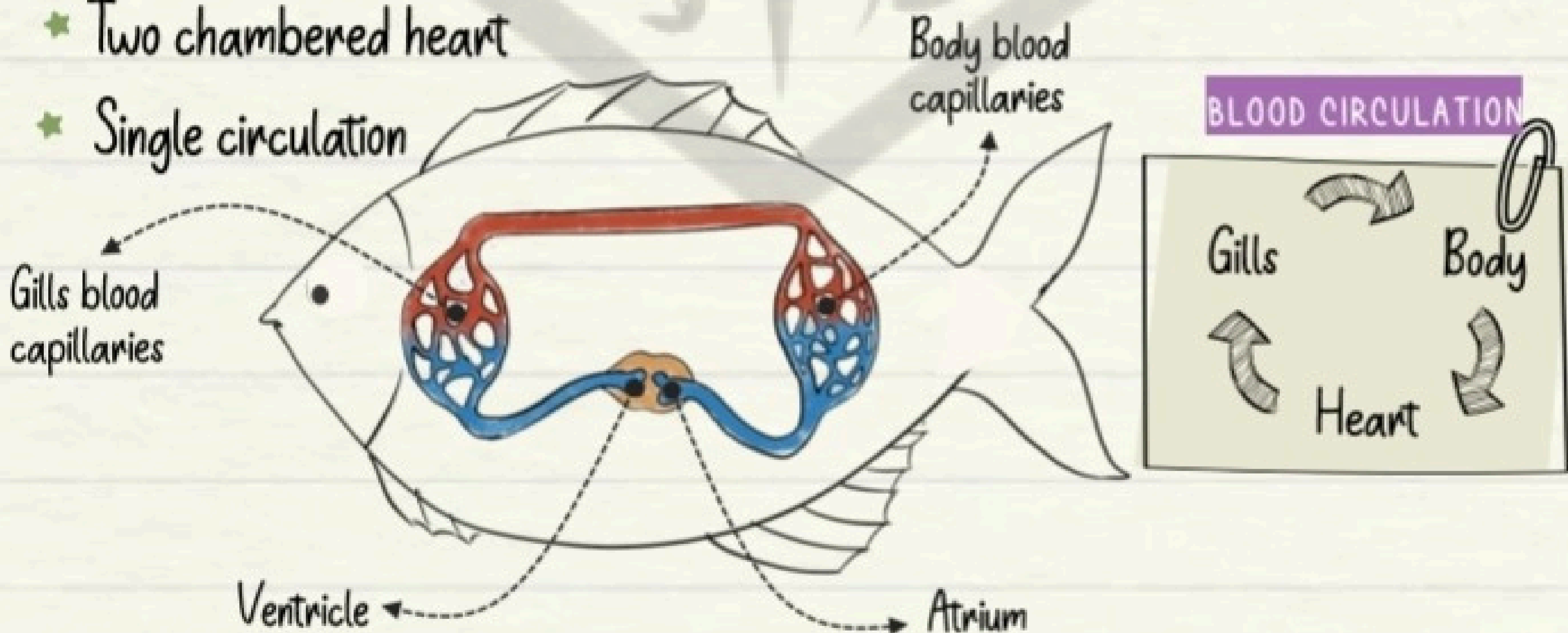
Right atrium receives deoxygenated blood while left atrium receives oxygenated blood



These animals does not use energy to maintain body temperature.

Circulatory System of fish

- ★ Two chambered heart
- ★ Single circulation



Multiple Choice Questions (MCQs)

1. The muscular tissue which helps in pumping of blood is called:

- a) Skeletal muscle
- b) Smooth muscle
- c) Cardiac muscle
- d) Voluntary muscle

2. Which part of the heart receives oxygenated blood from lungs?

- a) Right atrium
- b) Left atrium
- c) Right ventricle
- d) Left ventricle

3. The blood vessels that carry blood away from the heart are called:

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

4. Which of the following transports nitrogenous waste in humans?

- a) Plasma
- b) RBC
- c) WBC
- d) Platelets

5. Which is the main excretory organ in human beings?

- a) Skin
- b) Lungs
- c) Kidney
- d) Liver

6. The process of removal of metabolic waste is called:

- a) Transpiration
- b) Respiration
- c) Excretion
- d) Circulation

7. The fluid that transports digested food in humans is:

- a) RBC
- b) Lymph
- c) Platelets
- d) Plasma

8. The chamber of the heart which pumps oxygenated blood to the body is:

- a) Right atrium
- b) Right ventricle
- c) Left atrium
- d) Left ventricle

9. The double-walled sac that protects the heart is called:

- a) Myocardium
- b) Endocardium
- c) Pericardium
- d) Epicardium

10. Which part of the nephron is responsible for filtration of blood?

- a) Loop of Henle
- b) Collecting duct
- c) Glomerulus
- d) Bowman's capsule

11. The instrument used to measure blood pressure is:

- a) **Thermometer**
- b) **Barometer**
- c) **Sphygmomanometer**
- d) **Stethoscope**

12. Which of the following helps in clotting of blood?

- a) **RBC**
- b) **WBC**
- c) **Platelets**
- d) **Plasma**

13. Which valve is located between left atrium and left ventricle?

- a) **Tricuspid valve**
- b) **Bicuspid valve**
- c) **Pulmonary valve**
- d) **Semilunar valve**

14. Pulmonary artery carries:

- a) **Oxygenated blood to heart**
- b) **Deoxygenated blood to lungs**
- c) **Oxygenated blood to lungs**
- d) **Deoxygenated blood to heart**

15. The normal systolic pressure of human is:

- a) **80 mmHg**
- b) **120 mmHg**
- c) **60 mmHg**
- d) **150 mmHg**

16. Which of the following has valves?

- a) **Arteries**
- b) **Veins**
- c) **Capillaries**
- d) **None**

17. Which component of blood is responsible for oxygen transport?

- a) **WBC**
- b) **Platelets**
- c) **Hemoglobin**
- d) **Plasma**

18. Urine formation starts with:

- a) **Secretion**
- b) **Filtration**
- c) **Reabsorption**
- d) **Excretion**

19. Lymph is also called:

- a) **Interstitial fluid**
- b) **Plasma**
- c) **Coelomic fluid**
- d) **Synovial fluid**

20. Which blood vessels have walls one-cell thick?

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

Short Answer Type Questions

1. What is double circulation?

2. Differentiate between arteries and veins.

3. Why is transportation necessary in living organisms?

4. What is lymph? Write any two functions of lymph.

5. What is blood pressure? Which instrument is used to measure it?

6. What are the components of blood?

7. Name the two main types of blood circulation in humans.

8. What is the function of nephron in kidneys?

9. Explain why the walls of arteries are thick and elastic.

10. How is water transported in plants from roots to leaves?