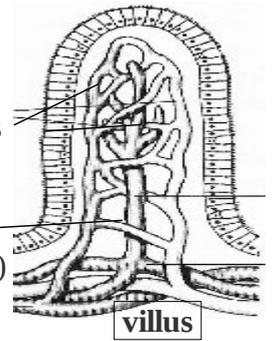


### 3. CIRCULATORY PATHWAYS

#### 1. Involvement of small intestine in the digestion and absorption

Nutrients	Food particles formed after digestion
Carbohydrate	Glucose, Fructose, Galactose → bloodcapillaries
Protein	Amino acids → bloodcapillaries
Lipid	Fatty acid , Glycerol → lacteal (lymph capillaries)



2. **Villi** ? - Villi are minute finger-like structures, having blood capillaries and lymph lacteals, seen in the infoldings of the small intestine. Food nutrients are absorbed in to blood through the villi.

3. The advantage of increased length of small intestine ?

Due to the increased length, small intestine can accommodate more villi and there by increases the surface area of absorption.

4. **Blood** - Functions ?

Transport of materials, providing immunity, maintenance of body temperature..

5. **Human Blood**

**55% Plasma** (fluid)

[Up to 92% water, organic compounds like proteins, amino acids, enzymes, hormones, glucose, vitamins, urea etc. and various inorganic salts and ions ]

**45% Blood cells**

[Red blood corpuscles(RBC), white blood corpuscles (WBC), platelets]

6. Function of blood cells?

RBCs are for transporting respiratory gases (O<sub>2</sub> and CO<sub>2</sub>).

WBCs are to provide immunity to the body.

Platelets are to plug wounds and for the clotting of blood.

7. Types of white blood corpuscles (WBC) ?

Monocytes, Basophils, Neutrophils, Eosinophils, and Lymphocytes (**MBNEL**).

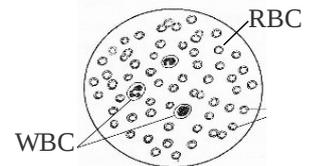
8. Construct suitable logos for a poster describing the importance of blood donation.

*Blood donation Life donation*, Blood donation is not harmful and a sacred thing.

9. **Lymph** - The colourless fluid seen inside the lymph vessels.

Liquid part of blood oozes out in to the intracellular spaces to form tissue fluid and when tissue fluid enters the lymph capillaries, the fluid is said to be lymph.

Lymph do not contain RBCs or platelets. Fatty acids and glycerol are carried by the lymph to the heart.



10. From small intestine, the food particles except fatty acids and glycerols , are transported through the liver. Why ?

Liver maintains the normal level of glucose in blood by converting excess glucose in to glycogen or by converting stored glycogen in to glucose.

Liver also converts ammonia in to less harmful urea. Liver neutralise all poisonous or harmful substances, including alcohol.

11. The normal rate of glucose in human blood ? 70-110mg/100ml

12. **Diabetes** ? A condition in which blood glucose increases more than 126mg/100ml.

13. **Human Heart**

Position - placed in the thoracic cavity, behind sternum, in between the lungs.

Size - approximately 12 cm long and 9cm broad. (about one's fist)

Weight - about 300 gm.

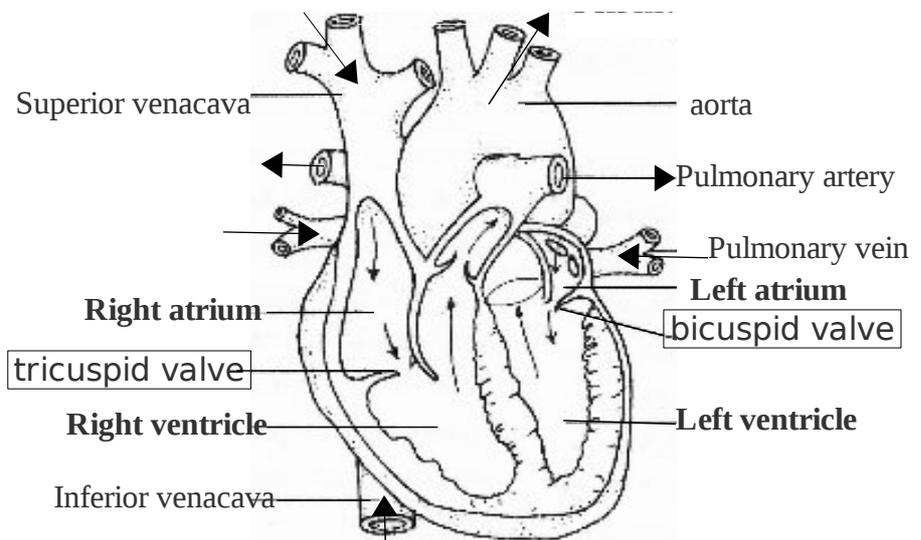
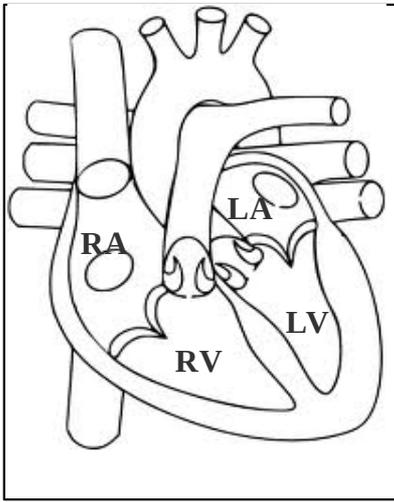
Envelope - pericardium, a double membrane with pericardial fluid filled inside.

Chambers - **4** (upper left & right atria and lower left & right ventricles)

Valves between chambers - Tricuspid valve (right) and Bicuspid (left) valve.

Arteries - pulmonary artery (deoxygenated blood), aorta (oxygenated blood).

Veins - pulmonary vein (oxygenated), inferior-superior venacavas (deoxygenated.)



14. **Pacemaker** ? - The sino-atrial node (SA Node), which initiates the movement and control of heart beat, is termed as the pacemaker of heart. SA node is seen at the upper part of the right atrium.

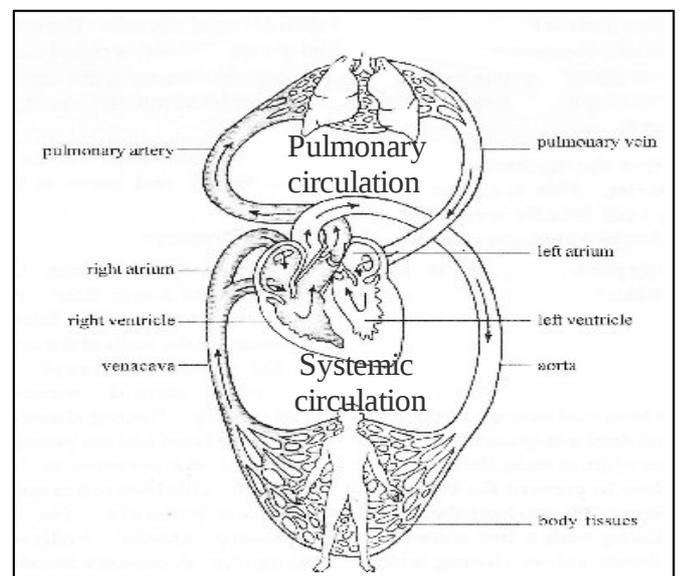
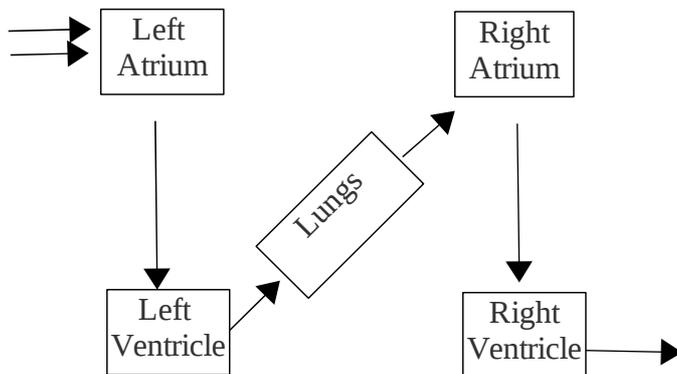
15. **Heart beat** ? - One heart beat consists one contraction (systole) and rest (diastole) of heart chambers. Normal heart beat is 72 per minute..  
[0.8 seconds in between two consecutive beats]

16. The instrument for measuring blood pressure ? - Sphygmomanometer.

[Normal Blood Pressure is 120/80 mm Hg, which means, increased pressure or systolic pressure is 120 mm Hg and decreased pressure or diastolic pressure is 80 mm Hg.]

### 17. **Blood circulation**

Our blood circulation includes both the **Pulmonary circulation** (blood circulation between heart and lungs) and the **Systemic circulation** (blood circulation between heart and body organs).



[Remember, the blood vessels that carry blood to the atrium are **Veins**. Those vessels that carry blood from ventricles are **Arteries**]

18. Why is our blood circulation called as *double circulation* ?

During one cycle of our blood circulation, blood flows through the heart twice. There for, our our blood circulation is called *double circulation*.

19. Blood circulation in man is 'closed', while that in cockroach is 'open'. Why is it say so ?

In man, blood flows through closed blood vessels. Such type of blood circulation is known as closed blood circulation. In cockroach and moths, blood (body fluid – or the Haemolymph) fills the body cavities and so contact directly with the body tissues. Such type of circulation is is known as open circulation.

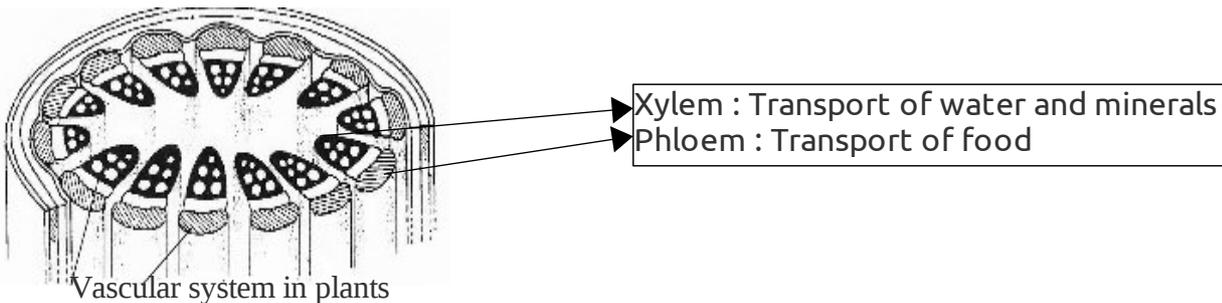
20. Why is pulmonary circulation (blood flow to the lungs) important ?  
To purify blood by eliminating the CO<sub>2</sub> and receiving oxygen from lungs.
21. How is water absorbed from the alimentary canal ?  
Water is absorbed mainly through the walls of the large intestine.

**22. Transport of nutrients in other organisms.**

Amoeba, Paramecium - The cyclic movement of the cytoplasm (cyclosis) helps to reach food nutrients all parts.

Cockroach & other insects - Body tissues get nutrients directly from the haemolymph (body fluid).

In Plants - Water and minerals are transported through the xylem vessels.  
Food is transported through the phloem vessels.



**23. Vascular tissues in plants**

XYLEM	PHLOEM
<p>* Vessels which carry water and minerals. * Include the Tracheids and Vessels and Xylem parenchyma.</p> <p>tracheid</p> <p>vessel</p> <p>xylem parenchyma</p>	<p>* Vessels which carry food. * Include the Sieve tube, Companion cells and Phloem parenchyma.</p> <p>Sieve tube</p> <p>companion cell</p> <p>phloem parenchyma</p>

24. After removing the bark of the stem in the form of a ring, a boy observes the changes occurring to the plant part. What is the intention of the boy ?  
To prove that the phloem vessel conduct food from the leaves.
25. The mineral salts (Essential elements) for plants ?  
Macro elements like N, P, K, S, Mg and  
micro elements like Cu, Zn, Cl, Mn are the essential elements.

Nitrogen (N)	- Protein, Nucleic acid ...
Phosphorus (P)	- Nucleic acid
Sulphur (S)	- Protein
Magnesium (Mg)	- Chlorophyll