Blood

Blood is a connective tissue in fluid form. It is considered as the:

1- **'Fluid of life'** because it carries oxygen from lungs to all parts of the body and carbon dioxide from all parts of the body to the lung.
2- **'Fluid of growth'** because it carries nutritive substances from the digestive system and hormones from endocrine gland to all the tissues.
3- **'Fluid of health'** because it protects the body against the diseases and gets rid of the waste products and unwanted substances by transporting them to the excretory organs like kidneys.

Major Functions of Blood

1- **Distribution & Transport** oxygen from lungs to body cells and carbon dioxide from body cells to lungs and also transport nitrogenous wastes from body cells to kidneys and hormones from glands to body cells

2- Regulation (maintenance of homeostasis):

a. maintenance of normal body pH.

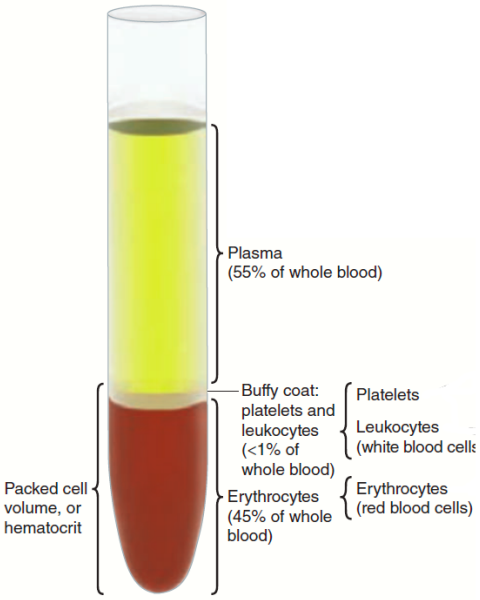
b. maintenance of circulatory/interstitial fluid electrolytes aid blood proteins (albumin).

c. maintenance of temperature (blushed skin).

3. Protection platelets and proteins "seal" vessel damage protection from foreign material & infections.

Composition of Blood

Blood contains the blood cells which are called **formed elements** and the liquid portion known as **plasma**.



*Blood Cells

Three types of cells are present in the blood:

1. Red blood cells or erythrocytes.
2. White blood cells or leukocytes.
3. Platelets or thrombocytes.

***Plasma:** is the fluid portion of the blood. It constitutes approximately 55% of a given volume of blood. It is a straw-colored liquid, about 90% water. The **functions** of blood plasma include transporting nutrients, gases, and vitamins; regulating electrolyte and fluid balances; and maintaining a consistent blood pH of between 7.35 and 7.45.

Plasma is obtained by collection the blood to anticoagulant tube (ex: EDTA) put it in the centrifuge at 2500 to 3000 rpm for 10 minutes.

***Serum:** is the clear straw-colored fluid that oozes from blood clot. When the blood is shed or collected in a container, it clots. In this process, the fibrinogen is converted into fibrin and the blood cells are trapped in this fibrin forming the blood clot.

Serum is obtained by allowing the whole blood to clot at room temperature (generally 20–30 minutes). When the clot has formed, centrifuging it at 2500 to 3000 rpm for 10 minutes.

Serum = Plasma – Fibrinogen

PLASMA	SERUM
• anti-coagulants are needed for purification • it can be prepared as soon as it has been mixed thoroughly • fibrinogen is present	• anti-coagulants are not needed • 30 minutes delay for a clot formation • fibrinogen is absent