Chapter 14: Transport

(Short Questions Answers)

What is haemorrhage? Give its effects.

It is the discharge of blood from blood vessels. Especially important is, the brain haemorrhage which results from bursting of any of the arteries supplying the brain. Slow haemorrhages may not cause decrease in the volume of blood, as this may be replaced as rapidly as it is lost. However, the lost red blood cells and their pigment, haemoglobin, may not be replaced and often the first signs and symptoms of severe chronic blood loss are those of anaemia: tiredness, pallor, and breathlessness on exertion. Severe haemorrhage, if untreated, may result in fainting and even death.

What are the major components of lymphatic system?

The system comprises of lymph capillaries, lymph vessels, lymphoid masses, lymph nodes, and lymph – the fluid which flows in the system.

What is lymph?

The fluid that enters the lymph capillaries is called lymph.

Where is lymphatic system linked with blood circulatory system?

The thoracic lymph duct opens into subclavian vein of circulatory system.

What are lymph nodes?

Along the pathway, the lymph vessels, have, at certain points, masses of connective tissue where lymphocytes are present, these are lymph nodes.

Where are lymph nodes present.

Lymph nodes are present in the neck region, axilla and groin of humans.

Name some lymphoid masses.

The larger masses are spleen and thymus. Tonsils and adenoids are also lymphoid masses. These produce lymphocytes.

What is the life span of erythrocytes (RBC)?

The average life span of red blood cell is about four months.

What is the life span of leucocytes (WBC)?

Granulocytes survive for one week. Monocytes stay from 10-20 hours in the blood, then enter tissues and become tissue macrophages. In this form they can live for months or even for years, unless destroyed performing phagocytic function. Lymphocytes have life spans of months or even years.

What is the function of monocytes and nuetrophils?

They reach the site of wound where bacteria have gained entry.

What is the function of macrophages and nuetrophils?

They feed on bacterial invaders or other foreign cells, including cancer cells.

What is the function of eosinophils?

They are phagocytic, and ingest foreign proteins and immune complexes rather than bacteria.

What is the function of basophils?

Basophils produce heparin a substance that inhibits blood clotting. These also produce chemicals, such as histamine, that participate in allergic reactions in response to tissue damage and microbial invasion.

Account for the functions of plasma proteins, or Name the proteins present in blood plasma. Give their functions.

Immunoglobulins (antibodies) play role in body's defense against disease Globulins maintain viscosity of blood. Albumin is a carrier molecule for fatty acids and it also plays a role in maintaining the osmotic pressure in blood. Prothrombin acts as a catalyst in blood clotting process. Fibrinogen takes part in the blood clotting process.

Name the mammals having nucleated RBC.

Camel and Llama

What is the shape of erythrocytes?

These cells are biconcave in mammals and have an elastic cell membrane. They are not biconcave, but oval or spherical in shape in all the other vertebrates.

Where RBC are formed in man?

Red blood cells are formed principally in the red bone narrow of short bones, such as the sternum, ribs and vertebrae. In the embryonic life, they are formed in the liver and spleen.

What is the function of RBC?

Their main function is to transport oxygen and carbon dioxide.

What is number of RBC and WBC in 1 mm of blood?

A cubic millimetre of blood contains 5-512 million of RBC in males and 4-492 million in females. On cubic millimetre of blood contains 7000 to 8000 of WBC (leucocytes).

What is the function of lymphocytes?

Lymphocytes help to provide immunity against the disease.

What are platelets?

These are not cells, but are fragments of large cells called megakaryocytes, about 2-3um in diameter.

What is the composition of wall of heart?

The wall of the heart is composed of three layers:

- Endocardium – outermost layer
- Myocardium – middle layer
- Epicardium – innermost layer

What is the function of pericardium?

Pericardium protects the heart, prevents it from over extension, and reduces friction.

What is myocardium made up of?

Myocardium of the heart is made up of special type of muscles, the cardiac muscles. The cardiac muscle fibres contain myofibrils, and myofilaments of myosin and actin.

What is tricuspid valve?

The valve present between right atrium and right ventricle is called tricuspid valve as it has three flaps.

What is bicuspid valve?

The valve present between left atrium and left ventricle is called bicuspid valve as it has two flaps.

What are chordae tendinae?

Chordee tendinae are fibrous cords which attach tricuspid and bicuspid valves to the papillary muscles which are extensions of wall of the right ventricle.

What is semilunar valve?

The valves present at the base of pulmonary trunk and aortic trunk are called semilunar valves. They prevent the backward flow of blood.

What are coronary arteries?

At the base of aorta, first pair of arteries, the coronary arteries, arise, and supply blood to the heart.

How many branches are given off by aorta before descending down?

Aorta forms an arch, and before descending down gives three branches . supplying blood to head, arms and shoulders.

Name the branches of iliac arteries and body parts supplied by them.

Each iliac artery divides into two arteries i.e., femoral and sciatic arteries supplying blood to legs.

What is ventricular systole? or How lub and dub sounds are made?

When the ventricles receive blood from atria, both ventricles contract simultaneously and the blood is pumped to pulmonary artery and aorta. The tricuspid and bicuspid valves close, and lub sound is made. Ventricular systole ends, and ventricles relax at the same time, semilunar valves at the base of pulmonary artery and aorta close simultaneously, and 'dub sound is made.

What is sino-atrial node or pace maker? What is the function of pace maker?

The stimulus for contraction of the heart originates in a specific region called the sino-atrial node (S-A node) or pace maker at the upper end of right atrium, Pacemaker is responsible for initiating the impulses which trigger the heart beat rate.

What is composition of S-A node?

The S-A node consists of a small number of diffusely oriented cardiac fibres, possessing few myofibrils and few nerve endings from the autonomic nervous system.

What is electrocardiogram?

It is an electrographic interpretation of the electrical flow of impulses in the heart, and is taken by E.C.G. (electrocardiograph) machine.

What is advantage of electrocardiogram?

It helps to know the abnormalities in the rhythmicity or conduction system of the heart. It may be corrected by the use of artificial pacemaker.

What are blue babies?

Failure of interatrial foramen (an opening present in the inter-atrial septum) to close or of ductus arteriosus to fully constrict results in cyanosis (blueness of skin) of new born. This is due to mixing of blood between two atria and the mixed blood is supplied to the body of newborn babies resulting in blueness of skin thus the name blue babies.

What is the wall of arteries made up?

The wall of the arteries is made up of three layers:

- tunica intima, it is inner , made of endothelium.
- tunica media, it is middle layer, made of thick muscular tissue and elastic fibres.
- tunica externa or adventitia, is the outer layer, made of connective tissue and elastic fibres.

What is atherosclerosis?

It is coexisting Atheroma and arteriosclerosis. Atherosclerosis – causes narrowing and hardening of arteries. This is a major condition leading to heart attack.

Define arteriosclerosis.

It is degenerative arterial change associated with advancing age, primarily a thickening of middle layer of arteries.

What is interstitial fluid? Write composition of interstitial fluid.

The pressure within capillaries causes continuous leakage of fluid from the blood plasma into the spaces that surround the capillaries and tissues. This fluid is known as interstitial fluid. It is the medium for the exchange of materials. Interstitial fluid consists primarily of water, but also has the dissolved nutrients, hormones, gases, wastes, and small proteins from the blood.

Define hypertension or What is meant by hypertension?

It is a condition of high blood pressure. Prolonged high blood pressure damages the lining of the blood vessels and also leads to weakening of heart muscles, with declining efficiency of its pumping action.

How thrombus is formed? or How thrombus formation take place?

Thrombus is a solid mass or plug of blood constituents (clot) in a blood vessel. This mass may, block (wholly or only in part) the vessels in which it forms, or it may be dislodged or carried to some other location in the circulatory system, in which case it is called an embolus. Thrombosis is the formation of thrombus.

Define heart attack or Myocardial infarction. or what is heart attack.

Blockage of blood vessel in the heart by an embolus (or by locally formed thrombus) causes necrosis or damage to portion of heart muscles, a condition known as a heart attack or technically myocardial infarction.

What are conditions to prevent heart attack?

- Avoid too much fatty food (especially rich in cholesterol).
- Maintain normal body weight.
- Control blood pressure by regular walk and exercise.
- Do not smoke.

What is stroke or cerebral infarction? or Define stroke and write its effects.

If the normal flow of blood is blocked by an embolus (or a locally formed thrombus), in a blood vessel in the brain, and causes necrosis, or death, of the surrounding neural tissue (owing to lack of Oz), this condition is called a stroke or cerebral infarction.

How flow of lymph is maintained?

The flow of lymph is maintained by:

- Activity of skeletal muscles.
- Movement of viscera.
- Breathing movements.
- The valves, which prevent back flow of lymph.

Why animal cells cannot withstand higher pressure potential?

The animal cells cannot withstand higher pressure potential as there is no cell-wall around protoplast.

What is the function of platelets?

Blood clotting is their important function.

How does blood clot?

In the process of blood clotting platelets cause conversion of fibrinogen, a solid plasma protein, into insoluble form, fibrin. The fibrin thread enmesh (catch) red blood cells and other platelets in the area of damaged tissue, ultimately forming a blood clot

What is leucaemia?

It is the result of uncontrolled production of white blood cells (leucocytes).

Name different types of leucaemia.

There may be neutrophilic leucaemia, eosinophilic leucaemia, basophilic, leucaemia, monocytic or lymphocytic leucaemia.

How leucaemia can be cured?

It is a very serious disorder and the patient needs to change its blood regularly with the normal blood, got from donors. It can be cured by bone marrow transplant which is in most cases effective, but very expensive treatment.

Why Thalassaemia is called Cooley's anaemia?

It is called Cooley's anaemia on the name of Thomas B. Cooley American paediatrician.

What are characteristics of thalassaemia? or What do you know about Thalassemia?

It is characterized by the presence of microcytes by splenomegaly (enlargement of spleen) and by changes in the bones and skin. This disease is more common in children especially of Mediterranean parents. The blood of these patients is to be replaced regularly, with normal blood. How thalassaemia is cured? transplant which is very expensive – and does not give 100% cure rate.

What is oedema? Also name its types.

Oedema is the presence of excess fluid in the tissues of the body. there are two types of oedema i.e., intracellular and extracellular oedema.

What is location of human heart?

The heart of man is located in the chest cavity, between two lungs.

What is pericardial cavity?

The heart is enclosed in a double membranous sac the pericardial cavity. Pericardial cavity is a part of body cavity and is between parietal and visceral lining of mesoderm.

What is antiserum? or Define antiserum.

Antiserum is a serum containing antibodies.

What is immunity? Give its types.

The capacity to recognize the intrusion of any material foreign to the body and to mobilize cells and cell products to help remove the particular sort of foreign material with greater speed and effectiveness is called immunity. It has two types: Active immunity which is obtained by the use of vaccines. Passive immunity obtained when antibodies are injected in the form of antisera.

What do you know about vein?

Veins are the blood vessels which transport blood from body cells towards heart. They have larger lumen and thinner walls as compared to arteries.

How do humidity and vapour pressure affect rate of transpiration.

When air is dry the rate of diffusion of water molecules, from the surfaces of mesophyll cell, air spaces, and through stomata to outside the leaf, increases. So more water is lost, increasing the rate of transpiration. In humid air the rate of diffusion is much reduced. This decreases the rate of transpiration significantly.

What is the role of capillaries in blood circulation and transportation.

The capillaries are sites where exchange of materials i.e., gases, digested food, hormones etc., between blood and body tissue takes place.

What is the significance of lymph nodes?

Lymph nodes are lymphoid masses present in the neck region, axilla and groin of humans. They produce lymphocytes. Spleen and thymus, tonsils, i adenoids are also lymphoid masses.