Short Answer Type Questions-II

Q. 1. What is blood, plasma and serum ?

Ans. Blood : It is specialized kind of living fluid connective tissue of opaque red colour of alkaline nature and salty in taste. Its specific gravity is 1.050-1.060. The blood contains a fluid part-the plasma and the solid part the corpuscles.

Plasma : Plasma is a pale straw-coloured fluid occupying about one half of the total blood volume. It has about 90-92 per cent water and 8 to 10 per cent solids.

Serum : Serum is the name given to blood plasma which has its protein fibrinogen removed. In this form the plasma can not clot, so it can be stored in hospital blood banks for transfusions in emergencies.

Q. 2. Does it make any difference to have the haemoglobin in the corpuscles rather than in plasma ? Explain.

Ans. There is great difference in respects of efficiency of carrying the oxygen from respiratory organs to the body tissue as follows :

S. No.	Haemoglobin in corpuscles	Haemoglobin in plasma
(i)	As RBC are small, rounded and in more in quantity, so haemoglobin is exposed with large combined surface area to absorb O_2.	In plasma, the exposed surface area for haemoglobin is very limited in comparison to the RBC, the result is the absorption of O_2 in less amount.
(ii)	When RBC pass through the small capillaries of respiratory organs, one by one, they have ample time and surface, to absorb oxygen.	The haemoglobin dissolved in plasma has lesser time as it pass quickly, (being liquid) through the box of capillaries.

Q. 3. Why lymph acts as middle man of the body ?

Ans. (i) Lymph acts as a "middle man" which transports oxygen, food materials, hormones, etc., to the body cells and brings carbon dioxide and other metabolic wastes, from the body cells to blood and then finally pours the same into the venous system. Body cells are kept moist by the lymph.

(ii) Lymph capillaries present in the intestinal villi are called lacteals which are associated with absorption and transportation of fat and fat soluble vitamins.

Q. 4. Briefly describe the wall structure of artery and vein.

Ans. The wall of an artery and a vein consists of three coats:

(i) Tunica externa : It is the outermost coat which is formed of connective tissues. Tunica externa is also called tunica adventitia.

(ii) Tunica media: It is a middle coat which is chiefly formed of elastic connective tissue and smooth muscle fibres. It is thicker in artery.

(iíi) Tunica interna : It is the innermost coat which is made up of two parts.

(1) Elastic membrane is made up of elastic tissue of yellow fibres. It is thicker in artery.

(2) Endothelium is made up of flattened squamous epithelial cells lining the lumen.

(3) Its cells are more elongated in artery.

(4) Blood capillaries consist of endothelium only.

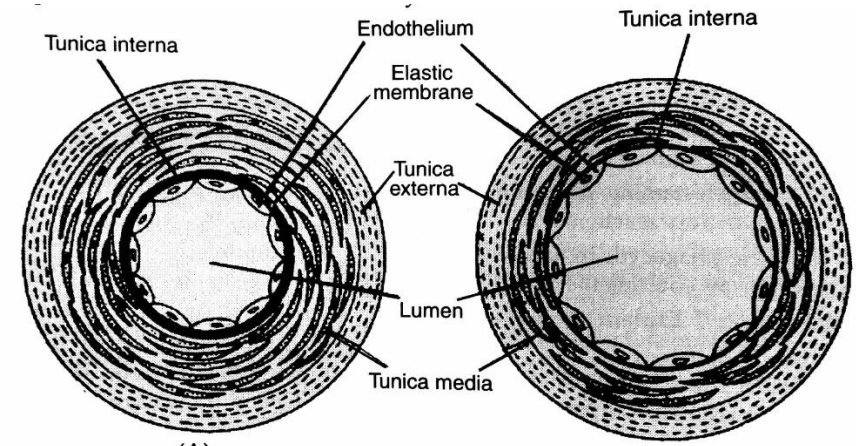

Fig. T.S. of (A) Artery and (B) Vein

Q. 5. Mention the functions of RBCs.

Ans. Functions of RBCs are:

(i) Haemoglobin of RBCs readily combines with oxygen to form oxyhaemoglobin. In the tissues, oxyhaemoglobin readily gives up its oxygen, which is used for oxidation of food.

(ii) RBCs also participate in transporting carbon dioxide from tissues to lungs. Carbon dioxide is carried by haemoglobin of red blood corpuscles to form carbamino-haemoglobin.

(iii) Moreover, haemoglobin is an excellent acid base buffer which is largely responsible for maintaining the pH of blood.

Q. 6. Write short note on Blood pressure.

Ans. Blood pressure : (i) The pressure exerted by the flow of blood on the elastic walls of the arteries is called blood pressure. (ii) The blood pressure is greater during the systole than during the diastole. (iii) The blood pressure is measured by the use of sphygmomanometer. (iv) In normal young person, the systolic pressure is 120 mm Hg and diastolic pressure is 80 mm Hg. (v) It is normally expressed as 120/80. (vi) The blood pressure varies with age. It is influenced by the rate of heart beat.

Q. 7. Describe the three types of valves present in the human heart ?

Ans. Valves in heart: (i) In the heart there are a number of openings through which blood passes from one chamber to another.

(ii) These openings are guarded by certain valves which regulate the flow of blood in desired direction. The bicuspid valves and tricuspid valves are present guarding the auriculo-ventricular apertures in between the auricles and ventricles on the left and right sides respectively. These valves open into the ventricles and prevent the back flow of the blood.

(iii) A set of semilunar valves are also present at the base of aorta in the ventricle. These allows the blood to flow only in direction of an aorta, when the left ventricle contracts.

Q. 8. Mention the functions of the three types of granulocytes ?

Ans. The functions of the three types of granulocytes are as follows:

(i) Eosinophils : They resist infections and are associated with allergic reactions.

(ii) Basophils: They release histamine, serotonin, etc. are involved in inflammatory reactions.

(iii) Neutrophils : They are phagocytic in nature and destroy foreign organisms entering the body.

Q. 9. What are nodal tissues ? Explain their role in heart beat.

Ans. The heart beat results from a wave of electrical potential called the cardiac impulse, which originates from nodal tissue like sinu-atrial node (SAN), auricular ventricular node (AVN), bundle of His and Purkinje fibres.

Functions : (i) SAN is located in the right auricle at the opening of the vena cavae. It is the part of the conducting system of heart. The stimulation arises initially in the sinu-atrial node.

(ii) The AVN is located in the right auricle in the inter- auricular septum. It gives rise to bundle of His, a muscular bridge that conducts stimulation from the auricles to the ventricles.

(ii) The bundle of His divides into two branches. The terminal branches of the conducting system are represented by a network of Purkinje fibres which convey stimuli to the myocardium.

Q. 10. Point out some differences between the arteries and veins.

Ans. Differences between arteries and veins:

S. No.	Arteries	Veins
(i)	These are vessels containing blood flowing away from the heart.	These are vessels containing blood flowing towards heart.
(ii)	In these blood flows under great pressure.	Blood flows under less pressure.
(iii)	Their walls are elastic, thick and muscular.	Walls are thin, nonelastic, fibrous.
(iv)	They are non- collapsible.	Collapsible.
(v)	Their cavity is small.	Cavity is large.
(vi)	Valves are not present in them.	Valves are present.

Q. 11. Differentiate between right ventricle and left ventricle. [V. Imp.]

Ans. Differences between Right ventricle and Left ventricle:

S. No.	Right ventricle	Left ventricle
(i)	Right ventricle is smaller than the left ventricle.	Left ventricle is comparatively larger than right ventricle.
(ii)	Receives and pushes deoxygenated blood.	Receives and pumps oxygenated blood.
(iii)	Crescent shaped.	Biconvex in shape.
(iv)	The wall of right ventricle is thinner than left ventricle.	The wall of it is thicker than right ventricle.

Q. 12. Who reported the ABO blood grouping in human beings for the first time? What is the basis for this grouping.

Ans. Karl Landsteiner reported for the first time ABO blood groups in human being. This grouping is based on the presence or absence of two antigens on the RBC's namely A and B. In a blood transfusion, the blood of a donor has to be matched with the blood of a recipient as transfusion of mismatched blood groups leads to agglutination of blood.

Q. 13. Differentiate between erythrocytes and leucocytes.

Ans. Differences between Erythrocytes and Leucocytes:

S. No.	Erythrocytes	Leucocytes
(i)	These are called RBCs.	These are called WBC's.
(ii)	Their number is about 4.5-5.0 million per mm^3.	Their number is approx. 5000-8000 per mm^3.
(iii)	They are red coloured.	They are colourless.
(iv)	They transport oxygen and small amount of carbon dioxide.	There is no respiratory pigment in them.
(v)	No role in defence and immunity of the body.	Have an important role in defence and immunity of body.

(Any three)

Q. 14. What are the important functions of the circulatory system ?

Ans. (i) The circulatory system supplies food, oxygen, enzymes, hormones and other substances to the different cells of the body.

(ii) It carries the end products of metabolism to the organs which excrete them.

(iii) It provides a strong defence to the body in prevention against invasion of infectious microorganisms.

(iv) It maintains body temperature, homeostasis of the tissue fluids and acid base balance.

Q. 15. How does the blood flow through the heart during the different phases of the cardiac cycle ?

Ans. The action of the human heart consists of a series of events, which follow one another with great rapidity.

Main events in cardiac cycle are:

(i) Auricular systole,

(ii) Ventricular systole and

(iii) Joint diastole.

Thus, we can say that the contraction of the heart and its relaxation constitute cardiac cycle or heart beat. The duration of the cardiac cycle varies inversely with the cardiac rate. The heartbeat is 72 times per minute in man. Single heartbeat lasts for 0.8 of a second. In such heart beats, blood comes to heart and then is propelled from auricles to ventricles and then to arteries. The number of heartbeats per minute is very much influenced by age, size, sex, temperature.

Q. 16. Explain the disorders of circulatory system.

Ans. The improper functioning of the heart may lead to certain disorders such as

(i) Hypertension : A continuous or sustained rise in the arterial blood pressure is known as hypertension. The normal pressure in a healthy individual is 120/80mmHg. But increase in the blood pressure beyond 140/90mmHg is referred to as hypertension. High blood pressure can harm the vital organs. It compels the heart to work excessively, due to which congestive heart disease may set in.

(ii) Coronary heart disease : (CAD) : It is also known as atherosclerosis. It affects the blood vessels that supply blood to the heart muscles. This is due to the deposition of fat, cholesterol and Ca^{+} and fibrous tissues on the walls of the arteries which results in the narrowing of the arterial lumen.

(iii) Angina : It is also known as "angina pectoris" The symptom is acute chest pain. When adequate quantity of oxygen do not reach the heart muscles pain occurs.

(iv) Heart failure : It is the state of heart which is not able to pump the blood effectively enough to meet the body needs. As congestion of the lungs is the main reason for this heart failure it is also known as congestive heart failure