This effect can be beneficial, because it tends to drive additional oxygen into the circulation, but this benefit also has a risk, the increased pressure can also drive nitrogen gas into the circulation.
This increase in blood nitrogen content can lead to a condition called **nitrogen narcosis.**
When the diver ascends to the surface too quickly a condition called 'bends' or decompression sickness occurs and nitrogen comes out of solution while still in the blood forming bubbles.
Small bubbles in the blood are not harmful, but large bubbles can lodge in small capillaries, blocking blood flow or can press on nerve endings.
Decompression sickness is associated with pain in joints and muscles and neurological problems including stroke.
The risk of nitrogen narcosis and bends is common in scuba divers.
During carbon–dioxide poisoning, the demand for oxygen increases. As the O2 level in the blood decreases it leads to suffocation and the skin turns bluish black.

CHAPTER-7 BODY FLUIDS AND CIRCULATION

Evaluation

1.What is the function of lymph?

(a) Transport of O_2 into brain (b) Transport of CO_2 into lungs

(c) Bring interstitial fluid in blood (d) Bring RBC and WBC in lymph node

2.Which one of the following plasma proteins is involved in the coagulation of blood?

(a) Globulin **(b) Fibrinogen** (c) Albumin (d) Serum amylase

3.Which of the following WBCs are found in more numbers?

(a) Eosinophil **(b) Neutrophil** (c) Basophil (d) Monocyte

4.Which of the following is not involved in blood clotting?

(a) Fibrin (b) Calcium (c) Platelets **(d) Bilirubin**

5.Lymph is colourless because

(a) WBC are absent (b) WBC are present

(c) Haemoglobin is absent **(d) RBC are absent**

6.Blood group is due to the presence or absence of surface

(a) Antigens on the surface of WBC (b) Antibodies on the surface of RBC

(c) Antigens of the surface of RBC (d) Antibodies on the surface of WBC

7.A person having both antigen A and antigen B on the surface of RBCs belongs to blood group

(a) A (b) B **(c) AB** (d) O

8.Erythroblastosisfoetalis is due to the destruction of

(a) Foetal RBCs (b) Foetus suffers from atherosclerosis

(c) Foetal WBCs (d) Foetus suffers from minamita

9.Dub sound of heart is caused by

(a) Closure of atrio-ventricular valves (b) Opening of semi-lunar valves

(c) Closure of semi-lunar values (d) Opening of atrio-ventricular valves.

10Why is the velocity of blood flow the lowest in the capillaries?

(a) The systemic capillaries are supplied by the left ventricle, which has a lower cardiac output than the right ventricle.

(b) Capillaries are far from the heart, and blood flow slows as distance from the heart increases.

(c) The total surface area of the capillaries is larger than the total surface area of the arterioles.

(d) The capillary walls are not thin enough to allow oxygen to exchange with the cells.

(e) The diastolic blood pressure is too low to deliver blood to the capillaries at a high flow rate.

11.An unconscious patient is rushed into the emergency room and needs a fast blood transfusion. Because there is no time to check her medical history or determine her blood type, which type of blood should you as her doctor, give her?

(a) A^- (b) AB **(c) O^+** (d) O^-

12.Which of these functions could or could not be carried out by a red blood cell? Briefly justify your answer.

(a) Protein synthesis (b) Cell division (c) Lipid synthesis (d) Active transport

Ans. : Reason : None of these functions can be carried out by RBC. Red Blood Cells (RBC) contain haemoglobin pigment and play a major role in transport of respiratory gases.

13.At the venous end of the capillary bed, the osmotic pressure is

(a) Greater than the hydrostatic pressure (b) Result in net outflow of fluids

(c) Results in net absorption of fluids (d) No change occurs.

14.A patient's chart reveals that he has a cardiac output of 7500mL per minute and a stroke volume of 50 mL. What is his pulse rate (in beats / min)?

(a) 50 (b) 100 **(c) 150** (d) 400

15.At any given time there is more blood in the venous system than that of the arterial system. Which of the following features of the veins allows this?

(a) Relative lack of smooth muscles (b) Presence of valves

(c) Proximity of the veins to lymphatic's (d) Thin endothelial lining

16.Distinguish between arteries and veins.

Sl. No.	Arteries	Veins
1.	The wall of arteries is thick and non collapsible.	The wall of the vein is thin and have a larger lumen. They can be easily stretched.
2.	Arteries carry blood away from the heart.	Veins bring blood from different parts of the body to the heart.
3.	All arteries carry pure blood except the pulmonary artery.	All veins carry de oxygenated blood except the pulmonary veins.

Sl. No.	Arteries	Veins
4.	Arteries have no valves.	Veins have valves to prevent back flow of blood.
5.	The blood flows in arteries with great pressure.	The flow of blood in the veins is under low pressure.

17.Distinguish between open and closed circulation.

Sl. No.	Open Circulatory System	Closed Circulatory System
1.	Blood is pumped by the heart into the blood vessels that open into blood spaces (Sinuses) called haemocoel.	The blood is pumped by the heart into closed blood vessels.
2.	Blood is in direct contact with tissue cells.	Blood is not in direct contact with tissue cells.
3.	Exchange of respiratory gases, nutrients and waste products occurs directly between the blood and tissues.	Tissue fluids helps in exchange of respiratory gases, nutrients and waste products between blood and tissues.
4.	Resipratory pigments are absent.	Resipratory pigment (Haemoglobin) is present in the RBC of the blood.

18.Distinguish between mitral valve and semi lunar valve.

Sl. No.	Mitral Valve	Semilunar Valve
1.	It guards the opening between left auricle and left ventricle.	The opening of the right and left ventricles into pulmonary artery and aorta respectively are guarded by semilunar valves.
2.	It has two flaps or cusps.	Each valve is made up of three half-moon shaped cusps.

19.Right ventricular wall is thinner than the left ventricular wall. Why?

1. The right ventricle pumps deoxygenated blood into the pulmonary artery which carries blood to the lungs only whereas the left ventricle pumps blood into the aorta which distributes oxygenated blood to all parts of the body.
2. Hence the wall of the left ventricle is thicker and right ventricle has a thinner wall.

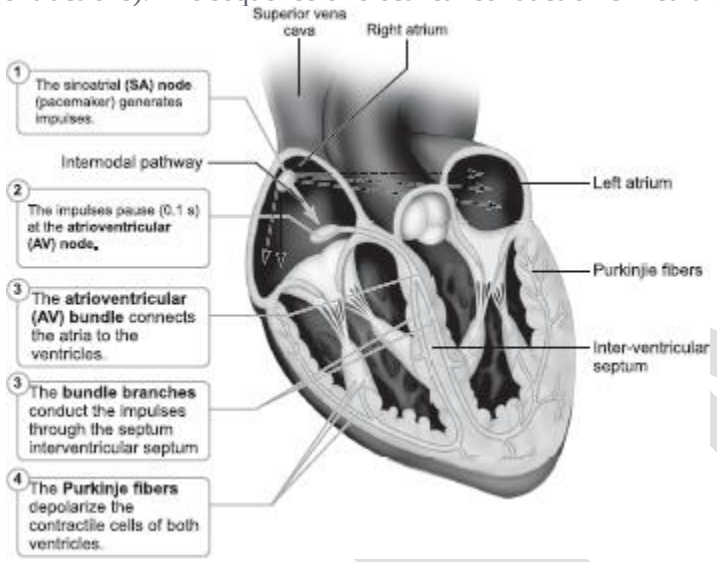
20.What might be the effect on a person whose diet has less iron content?

1. Iron is necessary for the formation of haemoglobin pigment.

2. A person whose diet is deficient in iron will not have sufficient haemoglobin production in his body. Haemoglobin plays a major role in transport of oxygen in the blood.
3. Since haemoglobin is a component of RBC, production of RBC will decrease leading to anaemia.
4. An anaemic person feels tired and giddy since oxygen supply in the body will be less because of the reduced number of RBC's in the blood.

21.Describe the mechanism by which the human heart beat is initiated and controlled.

The heart in human is **myogenic** (cardiomyocytes can produce spontaneous rhythmic depolarisation that initiates contractions). The sequence of electrical conduction of heart is shown below.



1. The cardiac cells with fastest rhythm are called the Pacemaker cells, which are located in the right sinuatrial (SA) node/ Pacemaker.
2. On the left side of the right atrium is a node called auriculo ventricular node (AV node).
3. Two special cardiac muscle fibres originate from the auriculo ventricular node and are called the bundle of Hiswhich runs down into the interventricular septum and the fibres spread into the ventricles. These fibres are called the Purkinjiefibres.
4. Pacemaker cells produce excitation through depolarisation of their cell membrane. Early depolarisation is slow and takes place by sodium influx and reduction in potassium efflux.
5. Minimum potential is required to activate voltage gated calcium (Ca^+) channels that causes rapid depolarisation which results in action potential. The pace maker cells repolarise slowly via K^+ efflux.

22.What is lymph? Write its function.

About 90% of fluid that leaks from capillaries eventually seeps back into the capillaries and the remaining 10% is collected and returned to blood system by means of a series of tubules known as**lymph vessels** or **lymphatics.** The fluid inside the lymphatics is called **lymph.**

Functions of lymph :

1. The narrow passages in the lymph nodes are the sinusoids that are lined with macrophages. The lymph nodes successfully prevent the invading microorganisms from reaching the blood stream.
2. Fats are absorbed through lymph in the lacteals present in the villi of the intestinal wall.

23.What are the heart sounds? When and how are these sounds produced?

1. Rhythmic contraction and expansion of heart is called heart beat.
2. The contraction of the heart is calledsystole and the relaxation of the heart is called diastole.
3. The heart normally beats 70-72 timesper min in a human adult.

4. During each cardiac cycle two sounds are produced that can be heard through a stethoscope.
5. The first heart sound (lub) is associated with the closure of the tricuspid and bicuspid valves whereas second heart sound (dub) is associated with the closure of the semilunar valves. These sounds are of clinical diagnostic significance.

24.Select the correct biological term.

Lymphocytes, red cells, leucocytes, plasma, erythrocytes, white cells, haemoglobin, phagocyte, platelets, blood clot.

(a) Disc shaped cells which are concave on both sides.

(b) Most of these have a large, bilobed nucleus.

(c) Enable red cells to transport blood.

(d) The liquid part of the blood.

(e) Most of them move and change shape like an amoeba.

(f) Consists of water and important dissolved substances.

(g) Destroyed in the liver and spleen after circulating in the blood for four months.

(h) The substances which gives red cells their colour.

(i) Another name for red blood cells.

(j) Blood that has been changed to a jelly.

(k) A word that means cell eater.

(l) Cells without nucleus.

(m) White cells made in the lymphatic tissue.

(n) Blocks wound and prevent excessive bleeding.

(o) Fragment of cells which are made in the bone marrow.

(p) Another name for white blood cells.

(q) Slowly releases oxygen to blood cells.

(r) Their function is to help blood clot in wounds.

Answer:

(a) Erythrocyctes

(b) Leucocytes (Not specific option)

(c) Question framed wrongly

(d) Plasma

(e) Phagocyte

(f) Plasma

(g) Erythrocyte

(h) Haemoglobin

(i) Erythrocyte

(j) Blood clot

(k) Phagocyte

(l) Erythrocytes / Platelets

(m) Lymphocytes

(n) Blood clot

(o) Red Cells

(p) Leucocytes

(q) Haemoglobin

(r) Platelets

25.Select the correct biological term.

Cardiac muscle, atria, tricuspid systole, auricles, arteries, diastole, ventricles, bicuspid valve, pulmonary artery, cardiac cycle, semi lunar valve, veins, pulmonary vein, capillaries, vena cava, aorta.

(a) The main artery of the blood.

(b) Valves between the left atrium and ventricle.

(c) Technical name for relaxation of the heart.

(d) Another name for atria.

(e) The main vein.

(f) Vessels which carry blood away from the heart.

(g) Two names for the upper chambers of the heart.

(h) Thick walled chambers of the heart.

(i) Carries blood from the heart to the lungs.

(j) Takes about 0.8 sec to complete.

(k) Valves situated at the point where blood flows out of the heart.

(l) Vessels which carry blood towards the heart.

(m) Carries blood from the lungs to the heart.

(n) The two lower chambers of the heart.

(o) Prevent blood from re entering the ventricles after entering the aorta.

(p) Technical name for one heart beat.

(q) Valves between right atrium and ventricles.

(r) Technical name for contraction of the heart.

(s) Very narrow blood vessels.

Answer:

(a) Aorta

(b) Bicuspid

(c) Diastole

(d) Auricle

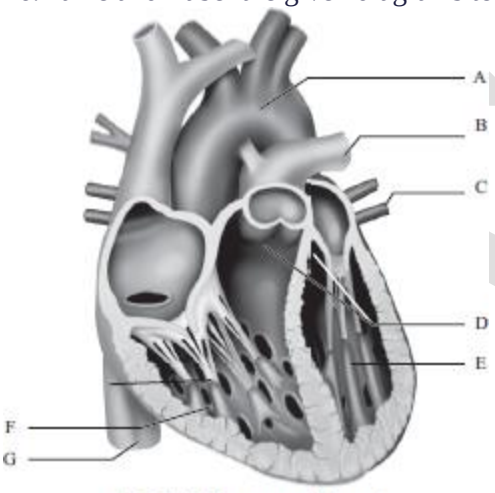
(e) Vena cava

(f) Arteries

(g) Atria /Auricles

(h) Ventricles
(i) Pulmonary Artery
(j) Cardiac cycle
(k) Semilunar Valves
(l) Veins
(m) Pulmonary Vein
(n) Ventricles
(o) Semilunar Valve
(p) Cardiac cycle
(q) Tricuspid Valve
(r) Systole
(s) Capillaries

26.Name and Label the given diagrams to show A, B, C, D, E, F, and G



L.S. Human Heart

Answer:

L.S. Human Heart
A. Aortic arch
B. Pulmonary Artery
C. Pulmonary Vein
D. Semilunar Valve
E. Left Ventricle
F. Right Ventricle
G. Inferior Vena Cava