INDIAN SCHOOL AL WADI AL KABIR

DEPARTMENT OF SCIENCE (2023 –2024)

CLASS: XI	SUBJECT: BIOLOGY	DATE OF COMPLETION: 26/11/2023
WORKSHEET WITH ANSWERS	TOPIC: BODY FLUIDS AND CIRCULATION	NOTE: A4 FILE FORMAT
CLASS & SEC:	NAME OF THE STUDENT:	ROLL NO.

I. OBJECTIVE TYPE QUESTIONS

1. The normal diastolic blood pressure in a normal healthy adult human is

1. 80 mm Hg
2. 60 mm Hg
3. 90 mm Hg
4. 110 mm Hg

2. _____ is a blood disorder where the haemoglobin is defective

1. Heterochromia
2. Alopecia
3. Haemolysis
4. Sickle cell anaemia

3. Which of the following two-word items mean the same thing?

1. Blood cancer – Haemophilia
2. Pacemaker – S A Node
3. Osteoporosis – arthritis
4. None of the above

4. In adult humans, _____ of lead or less in the blood is considered to be normal.

1. 40µg/dL
2. 20µg/dL
3. 10µg/dL
4. 50µg/dL

5. In humans, _____ is the difference between systolic and diastolic pressure.

1. 40 mm Hg
2. 20 mm Hg
3. 0 mm Hg
4. None of the above

6. An individual's blood is classified as _____ if an inherited protein is found on the surface of the blood cells.

1. ANA-Positive
2. Rh-Neutral
3. Rh-Negative
4. Rh-Positive

7. _____ is a condition where plaque builds up on the inside of arteries.

1. Arthrocentesis
2. Arthralgia
3. Arthritis
4. Atherosclerosis

8. _____ is a prenatal test in which, a sample of the fluid that surrounds the foetus is recovered for testing.

1. Paracentesis
2. Cordocentesis
3. Amniocentesis
4. None of the above

9. _____ carries deoxygenated blood to the lungs from the right ventricle.

1. Pulmonary artery
2. Pulmonary vein
3. Aorta
4. None of the above

10. Snake venom usually enters the body through an open wound and enters the bloodstream through the _____

1. Veins
2. Lymphatic system
3. Arteries

4. None of the above

11. _____ forms clots when blood vessels get damaged.

1. Platelets
2. Cellulose
3. Haemoglobin
4. None of the above

12. _____ is a fluid that drains from the lacteals of the small intestine into the lymphatic system during digestion. It usually contains fat and proteins.

1. Chyme
2. Bile
3. Chyle
4. None of the above

13. _____ is a small branch of an artery that leads into a capillary.

1. Capillaria
2. Areolas
3. Arteriole
4. None of the above

14. Humans use haemoglobin to carry oxygen in their blood. Similarly, mollusks and crustaceans use _____ to carry oxygen in their blood.

1. Hemovanadin
2. Hemerythrin
3. Haemoglobin
4. Hemocyanin

15. Severe loss of blood due to trauma is called

1. Exsanguination
2. Haemolysis
3. Concussion
4. None of the above

16. _____ is a condition where a blood clot forms in the circulatory system.

1. Thrombus
2. Strombus
3. Hematoma

4. None of the above

II. Assertion and reasoning:

a) Assertion and Reason are true and Reason is the correct explanation of the Assertion.
b) Assertion and Reason are true but Reason is not a correct explanation of the Assertion.
c) Assertion is true but the Reason is false.
d) Assertion and Reason are false.

17. Assertion: In most of the mammal RBCs are devoid of nucleus.
Reason: Red color is filled in the entire cytoplasm of RBCs, iron containing complex protein called hemoglobin.

18. Assertion: Type 'O' blood group individuals are called 'universal donors.
Reason: RBCs of 'O' blood group consists of both 'A' and 'B' surface antigens.

19. Assertion (A): Blood coagulates in uninjured blood vessels.
Reason (R): Uninjured blood vessels release an anticoagulant heparin.

20. Assertion: Fibrins are produced by the conversion of inactive fibrinogens in the plasma, in the presence of enzyme thrombin.
Reason: Plasma without fibrinogen and blood corpuscles is called serum.

III. CASE STUDY BASED QUESTIONS

Read the following and answer questions given below –

Blood is a special connective tissue consisting of a fluid matrix, plasma, and formed elements. Plasma is a straw coloured, viscous fluid constituting nearly 55 per cent of the blood. 90-92 per cent of plasma is water and proteins contribute 6-8 per cent of it. Fibrinogen, globulins, and albumins are the major proteins. Fibrinogens are needed for clotting or coagulation of blood. Globulins primarily are involved in defence mechanisms of the body and the albumins help in osmotic balance. Plasma also contains small amounts of minerals like Na+, Ca++, Mg++, HCO3 –, Cl–, etc. Glucose, amino acids, lipids, etc., are also present in the plasma as they are always in transit in the body. Factors for coagulation or clotting of blood are also present in the plasma in an inactive form. Plasma without the clotting factors is called serum. Erythrocytes, leucocytes, and platelets are collectively called formed elements and they constitute nearly 45 per cent of the blood. Leucocytes are also known as white blood cells (WBC) as they are colourless due to the lack of haemoglobin. They are nucleated and are relatively lesser in number which averages

6000-8000 mm–3 of blood. Leucocytes are generally short lived. We have two main categories of WBCs – granulocytes and agranulocytes. Neutrophils, eosinophils, and basophils are different types of granulocytes, while lymphocytes and monocytes are the agranulocytes. Neutrophils are the most abundant cells (60-65 per cent) of the total WBCs and basophils are the least (0.5-1 per cent) among them. Neutrophils and monocytes (6-8 per cent) are phagocytic cells which destroy foreign organisms entering the body. Basophils secrete histamine, serotonin, heparin, etc., and are involved in inflammatory reactions. Eosinophils (2-3 per cent) resist infections and are also associated with allergic reactions. Lymphocytes (20-25 per cent) are of two major types – 'B' and 'T' forms. Both B and T lymphocytes are responsible for immune responses of the body. Platelets also called thrombocytes, are cell fragments produced from megakaryocytes (special cells in the bone marrow). Blood normally contains 1,500,00-3,500,00 platelets mm–3. Platelets can release a variety of substances most of which are involved in the coagulation or clotting of blood. A reduction in their number can lead to clotting disorders which will lead to excessive loss of blood from the body.

21. Identity the correct statement

Statement 1 – Fibrinogens are absent in the plasma.

Statement 2 – Plasma without clotting factors is known as lymph.

Statement 3 – White blood cells are colourless.

Statement 4 –Haemoglobin is present in leucocytes.

a) Statement 1 and 2 are correct
b) Statement 2 and 3 are correct
c) Only Statement 3 is correct
d) All of the above statements are correct

22. _____ is iron containing complex protein present in blood

a) Globulins
b) Haemoglobin
c) Fibrinogen
d) Albumins

23. Give reason – why erythrocytes are known as red blood cells?

24. Enlist the type of Leucocytes with their categorisation.

25. What if number of thrombocytes are drastically reduced in blood?

IV. VERY SHORT QUESTIONS CARRYING 02 MARKS EACH.

Q.26. What happens if the blood does not coagulate?

Q.27. What is the role of the time gap in the passage of action potential from the sino-atrial node to the ventricle?

Q.28. Which are the most common symptoms observed in people infected with Dengue fever?

Q.29. What is the cardiac cycle?

V. SHORT ANSWER TYPE QUESTIONS CARRYING 03 MARKS EACH.

Q.30. Answer the following questions.
a) Which is the site where RBCs are formed?
b) Name the part of the heart that initiates and maintains the rhythmic activity
c) What is the heart of crocodiles is specific amongst reptilians?

Q.31. What is the functional role of the lymphatic system?

Q.32. Why are thrombocytes necessary for blood coagulation?

VI. LONG ANSWER TYPE QUESTIONS CARRYING 05 MARKS EACH.

Q.33. Describe the Rh incompatibility in humans.

Q.34. Explain the events in the cardiac cycle. Describe ‘double circulation’.

Q.35. Explain:
a) Hypertension
b) Coronary Artery Disease

ANSWER KEY AND HINTS

I.	**OBJECTIVE TYPE QUESTIONS - Multiple choice Questions: -**
1.	1
2.	4
3.	2
4.	3
5.	1
6.	4
7.	4
8.	3
9.	1
10.	2
11.	1
12.	3
13.	3
14.	4
15.	1
16.	1
17.	b
18.	c
19.	d
20.	c
13.	Oils. Ex : Mustard, sunflower
14.	Pulses. Ex : Kidney beans, gram, beans.
15.	Biotic factors like diseases, insects and nematodes, and abiotic factors like drought, salinity and waterlogging, heat, cold and frost have a negative impact on crop production.
16.	-Higher Yield and Improved Quality
17.	SHORT ANSWER TYPE QUESTIONS CARRYING 03 MARKS EACH.
18.	-No, increasing grain production only for storage in warehouses cannot solve the problem of malnutrition and hunger. Food security depends both on availability of food and access to it. As most of our population depends on agriculture for their livelihood, increasing the incomes of people working in agriculture becomes necessary to combat the problem of hunger. It forms the framework that supports the body. Anchors the muscles and supports the main organs of the body.
19.	-refers to the crossing between genetically dissimilar plants or organisms

20.	-the duration of sunlight available to plants is called photoperiod. It affects the growth, flowering, and maturation of crops.
III	**CASE STUDY BASED QUESTIONS**
21	c
22	b
23	Erythrocytes have a red coloured, iron containing complex protein named as haemoglobin. Haemoglobin gives the red colour to the Erythrocytes, hence the colour and name of these cells is Red Blood Cells.
24	Leucocytes are also known as white blood cells. Leucocytes are categorised into two main categories of WBCs – granulocytes and agranulocytes. Granulocytes – Neutrophils, eosinophils and basophils are different types of granulocytes. Granulocytes – Lymphocytes and monocytes are the agranulocytes.
25	Platelets release a variety of substances which are involved in the coagulation or clotting of blood. A reduction in their number can lead to clotting disorders which will lead to excessive loss of blood from the body.
26	Blood coagulates or clots whenever there is an injury or trauma. Coagulation limits unnecessary blood loss from the body. Its absence can cause huge blood loss and can be fatal.
27	It allows ventricles to relax. Thus, the ventricular pressure falls, leading to the closing of semilunar valves, and restricts the backflow of blood into ventricles.
28	The common symptoms observed in people infected with Dengue fever are: 1. Fever 2. Headache 3. muscle and joint pains 4. Significant increase in platelets count
29	The cardiac cycle is associated with the complete heartbeat from its production to the commencement of the next beat. It comprises of diastole, the systole, and the intervening pause.
30	a) Bone marrow b) Sinoatrial node c) Reptiles are characterized by having a 3 chambered heart except for the crocodile which has a 4 chambered heart, because of the partial division of ventricle through a septum.
31	It carries blood from the intestine to the liver before it is surrendered to the systemic

	circulation. Its importance is as follows: The blood from the alimentary canal is rich in glucose, amino acids, and other nutrients. Excess of glucose and fats are utilized by the liver when blood passes through during starvation. Conversion of toxic ammonia into urea that is later eliminated by the kidney. The liver generates proteins such as fibrinogen which are passed through the circulation of blood.
32	Platelets or thrombocytes are present in the blood are formed in the bone marrow and their life span is a week. Blood oozes out from our body whenever there is an injury, and the platelets are released to produce the clotting factor known as thromboplastin. With its presence and calcium ions, pro-thrombokinase is activated. Blood clot occurs with a series of reactions, plugging the injured blood vessel hence preventing further blood loss.
33	Rh antigen is seen on the RBC surface of majority humans, these are called Rh-positive individuals and when the antigen is absent, they are Rh-negative individuals. Both these individuals are phenotypically normal individuals. However, in these individuals, a problem emerges during pregnancy or transfusion of blood. The first blood transfusion from Rh-positive blood to the RI-T individual leads to no harm as the Rh-negative person acquires antibodies or Rh factors in their blood. During the second transfusion of blood, from Rh-positive blood to the Rh-negative individual, the antibodies already formed attack to destruct the RBC of the donor. In pregnancy, if the father's blood is Rh-positive and the mother's blood is Rh-negative, the blood of the fetus will be Rh-positive, which leads to serious issues. The Rh antigens of the fetus are not exposed to the Rh-positive blood of the mother during the first pregnancy, as they are separated from the placenta. But in the succeeding Rh-positive fetus, the anti-Rh factors from the mother destruct the RBCs of the fetus as the blood mixes which causes hemolytic disease in the newborn (HDN) known as erythroblastosis fetalis. This can be prevented through the administration of anti-Rh antibodies to the mother after the delivery of the first child.
34	The cardiac cycle makes for one heartbeat i.e., one complete cycle of relaxation and contraction occurring in the cardiac muscles, where one heartbeat constitutes for contraction(systole) and relaxation(diastole) of atria and ventricles. The events are: Atrial systole – Due to the wave of contraction, the atria contracts, that is triggered by the Sino-atrial node. As the bicuspid and the tricuspid valve are open, the blood is forced into the ventricles. Beginning of the ventricular systole – The wave of contraction triggered by the AV node causes the contraction of ventricles that leads to the bicuspid and tricuspid valve to close and hence generates the first heartbeat sound – "lub"

	Complete Ventricular Systole – After the ventricles contract, blood flows into the pulmonary trunk and aorta due to the opening of the semilunar valves. Beginning of the ventricular diastole – The ventricles relax while the semilunar valves remain closed, which causes the second heart sound – dub. Complete ventricular diastole – A fall in pressure of ventricles causes the opening of the bicuspid and the tricuspid valve and hence blood flows from the atria to the ventricles. Blood does not flow in the backward direction due to the contraction of the heart as the pressure inside the relaxed ventricles is lesser in comparison to the atria and the veins. Double circulation – Two distinct pathways are present in birds and mammals. The left and the right atria receive oxygenated and deoxygenated blood respectively which is passed on the ventricles of the same sides. The ventricles then pump it out of the heart without mixing it up.
35	a) Hypertension – High blood pressure is the most commonly occurring disease that affects the heart, blood vessels, brain, kidney an eye. Normal blood pressure is – 120/80. If it goes beyond 140mHg and 90 mm Hg, it is high blood pressure or hypertension. Its causes are: Coronary heart vessels get blocked. Smoking tobacco speeds up the process of heart rate. It tightens blood vessels and increases blood pressure. b) Coronary Artery Disease (CAD) – It arises due to the deposition of fatty substances on the walls of the arteries which causes atherosclerotic plaques. This leads to the lumen of the artery to diminish thereby blocking the flow of blood, which can sometimes block the arteries completely leading to a heart attack.

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