Shiksha Classes, Bhandara

Biology

Body Fluids And Circulation

(1.) Blood

(a.) is a specialized connective tissue consisting of 55% formed elements and 45% plasma

(b.) contains formed elements which represent the cellular protein

(c.) lacks fluid matrix

(d.) contains straw colored viscous fluid called plasma made up of 90%–92% protein

(2.) Match the items given **Column-I** with those in **Column-II** and select the correct option given below.

Column-I	**Column-II**
(A) Fibrinogen	(1) Osmotic balance
(B) Globulin	(2) Blood clotting
(C) Albumin	(3) Defence mechanism

Codes

(a.)

A	B	C
1	3	2

(b.)

A	B	C
1	2	3

(c.)

A	B	C
3	2	1

(d.)

A	B	C
2	3	1

(3.) Adult human RBCs are enucleate. Which of the following statements is/are most appropriate explanation for this feature?
(I) They do not need to reproduce.
(II) They are somatic cells.
(III) They do not metabolize.
(IV) All their internal space is available for oxygen transport.
Codes

(a.) Only IV

(b.) Only I

(c.) I, III and IV

(d.) II and III

(4.) Name the blood cells, whose reduction in number can cause clotting disorder, leading to excessive loss of blood from the body.

(a.) Erythrocytes

(b.) Leucocytes

(c.) Neutrophils

(d.) Thrombocytes

(5.) Serum differs from blood in

(a.) lacking globulins
(b.) lacking albumins
(c.) lacking clotting factors
(d.) lacking antibodies

(6.) Which of the following is correct?

(a.) Glucose, amino acids and lipids are present in the plasma as they are always in transit in the body.
(b.) Platelets are not included under formed elements.
(c.) A healthy individual has 9–10 g of Hb/100 mL of blood.
(d.) All the blood cells are nucleated.

(7.) Erythrocytes

(a.) are the most abundant of all the cells in blood
(b.) are formed in the red bone marrow in the adults
(c.) are devoid of nucleus in most of the mammals
(d.) all of these

(8.) A healthy human has on an average _____ millions of RBCs mm3 of blood.

(a.) 3–3.5
(b.) 2–3.5
(c.) 5–5.5
(d.) 4–4.5

(9.) CO_2 is carried by haemoglobin as

(a.) carboxyhaemoglobin
(b.) carbaminohaemoglobin
(c.) oxyhaemoglobin
(d.) both (a) and (b)

(10.) Phagocytic activity is not exhibited by

(a.) monocytes
(b.) neutrophils
(c.) basophil
(d.) macrophage

(11.) A person infected with dengue fever will show which one of the following symptom?

(a.) Significant decrease in RBCs count
(b.) Significant decrease in WBCs count
(c.) Significant decrease in platelets count
(d.) Significant increase in platelets count

(12.) Choose the correct option for the substance essential for coagulation of blood.

(a.) Heparin and calcium ions
(b.) Calcium ions and platelets factors
(c.) Oxalates and citrates
(d.) Platelet factors and heparin

(13.) Cells which lack nucleus in humans are

(a.) RBC
(b.) neutrophils
(c.) eosinophils
(d.) erythrocytes

(14.) Blood cells involved in antibody production are

(a.) B-lymphocytes (b.) T-lymphocytes

(c.) RBC (d.) neutrophils

(15.) The types of agranulocytes which are responsible for generation of immune response in the human body are

(a.) basophils (b.) neutrophils

(c.) eosinophils (d.) lymphocytes

(16.) Which one is true about leucocytes?

(a.) Their life span ranges from a few hours to few days. (b.) They are enucleate.

(c.) A healthy human has 6000–8000 million WBC mm-3 of blood. (d.) Neutrophils and monocytes may not be phagocytic.

(17.) Neutrophils are the most abundant white blood cells and constitutes _____% of the total WBCs. Basophils are the least abundant making _____% of the total WBCs.

(a.) 0.5–1; 60–65 (b.) 6–6.5; 0.5–1

(c.) 60–65; 0.5–1 (d.) 0.5–1; 6–6.5

(18.) The movement of leucocytes out of the circulatory system and toward the site of tissue damage or infections is called

(a.) diapedesis (b.) hematopoiesis

(c.) haemopoiesis (d.) diakinesis

(19.) The second most abundant type of leucocyte is

(a.) eosinophils (b.) monocytes

(c.) basophils (d.) lymphocytes

(20.) The largest leucocyte is

(a.) monocyte (b.) lymphocyte

(c.) thrombocyte (d.) neutrophil

(21.) Choose the incorrect match.

(a.)

Type of leucocyte	Composition (%)	Function
Neutrophils	60 – 65	Phagocytic

(b.)

Type of leucocyte	Composition (%)	Function
Basophils	0.5 – 1	Inflammatory reactions

(c.)

Type of leucocyte	Composition (%)	Function
Eosinophils	2 – 3	Allergic reactions

(d.)

Type of leucocyte	Composition (%)	Function
Monocytes	6 – 8	Produce immune response

(22.) Choose the incorrect statement

(a.) A person of O-blood group has anti-A and Anti-B antibodies in his blood plasma.

(b.) A person of B-blood group cannot donate blood to a person of A-blood group.

(c.) Blood group is designated on the basis of the presence of antibodies in the blood plasma.

(d.) A person of AB blood group is universal recipient.

(23.) Match the items given **Column-I** with those in **Column-II** and select the correct option given below.

Column-I

(A) Lymphatic system

(B) Pulmonary vein

(C) Thrombocytes

(D) Lymphocytes

Column-II

(1) Carries oxygenated blood

(2) Immune response

(3) Drains back the tissue fluid to the circulatory

(4) Coagulation of blood

Codes

(a.)

A	B	C	D
2	1	3	4

(b.)

A	B	C	D
3	1	4	2

(c.)

A	B	C	D
3	1	2	4

(d.)

A	B	C	D
2	1	3	4

(24.) Choose the correct statement.

(a.) People with A-blood group is universal donor.

(b.) People with B-blood group possess anti-B antibody in their plasma.

(c.) People with AB-blood group can agglutinate RBCs if the donor's blood group is A, B or O.

(d.) People with O-blood group are universal donors as they lack A and B antigens.

(25.) Find out which of the following statements are true and false.
(I) Rh-factor was discovered by Landsteiner and Wiener.
(II) An Rh negative person, if exposed to the blood of Rh positive blood, will form specific antibodies against Rh antigen.
(III) Nearly 80% of human population is Rh negative.
(IV) The Rh- antigen of the Rh positive foetus frequently gets exposed to the Rh negative blood of the mother in the first pregnancy.

(a.) I - false, II - false, III - true, IV - true
(b.) I - true, II - false, III - true, IV - true
(c.) I - true, II - true, III - false, IV - true
(d.) I - true, II - true, III - false, IV - false

(26.) Which of the ions play a very important role in blood clotting?

(a.) Na^+
(b.) K^+
(c.) Mg^{2+}
(d.) Ca^{2+}

(27.) Identify A, B, C and D for the reactions with respect to blood clotting

$$\text{Prothrombin} \xrightarrow{A,B} \text{thrombin}$$

$$\text{Fibrinogen} \xrightarrow{C,D} \text{fibrin}$$

(a.)

A	B	C	D
Thrombin	Mg^{2+}	Thrombokinase	K^+

(b.)

A	B	C	D
Thrombokinase	Mg^{2+}	Thrombin	Mg^{2+}

(c.)

A	B	C	D
Thrombin	Ca^{2+}	Thrombokinase	Ca^{2+}

(d.)

A	B	C	D
Thrombokinase	Ca^{2+}	Thrombin	Ca^{2+}

(28.) Thrombin

(a.) is a non-enzyme protein
(b.) converts fibrin into fibrinogen
(c.) converts soluble fibrinogen of plasma into insoluble fibrin
(d.) converts insoluble fibrinogen into soluble fibrin

(29.) The proteolytic enzyme which causes lysis of fibrin during fibrinolysis is

(a.) Plasmin
(b.) Thrombin
(c.) Thrombokinase
(d.) Fibrin

(30.) Read the following statements.
(I) Erythroblastosis foetalis can be avoided by administering anti-Rh antibodies.
(II) Prothrombin is synthesized in the liver in the pressure of Ca^{2+}.
(III) RBCs are the least abundant blood cells in humans.
(IV) The descending order of percentage share of WBCs in human blood is Neutrophils → Lymphocytes → Monocytes → Eosinophils → Basophils.

Which of the above statements are correct?

(a.) I, II, and III (b.) I and IV

(c.) I and III (d.) II and III

(31.) Arrange the steps of mechanism of blood coagulation in sequence
(I) Conversion of prothrombin into thrombin
(II) Coagulum formation
(III) Thrombokinase formation
(IV) Site of injury release tissue thromboplastins (V) Conversion of fibrinogen into fibrin

(a.) I→ IV → III → II → V (b.) III→ IV → V → I → II

(c.) IV→ III → I → V → II (d.) IV→ III → V → I → II

(32.) Which of the following is correct for lymph?

(a.) Transports O_2 to brain and CO_2 to lungs (b.) Returns the tissue fluid back to the cardiovascular system

(c.) Brings CO_2 and other metabolic waste from the body cells and dump it into the venous system (d.) Both (b) and (c)

(33.) An elaborate network of vessels called lymphatic system collects the tissue fluid and drains it back to the

(a.) arteries (b.) major veins

(c.) kidneys (d.) lungs

(34.) Which of the following is a lymphoid organ?

(a.) Thymus (b.) Spleen

(c.) Tonsils (d.) All of these

(35.) Lymph in comparison to blood possesses

(a.) more waste material and less protein (b.) less waste material and more protein

(c.) more waste material and more protein (d.) less waste material and less protein

(36.) Assertion: People having blood group O are the universal donors. Reasons: The RBCs of the person of 'O' blood group have no antibodies.

(a.) Both assertion and reason are correct and reason is the correct explanation of assertion. (b.) Both assertion and reason are correct, but reason is not the correct explanation of assertion.

(c.) Assertion is correct, but reason is incorrect. (d.) Both assertion and reason are incorrect.

(37.) Assertion: Leucocytes are also known as white blood cell (WBC). Reasons: Leucocytes are colourless due to lack of haemoglobin.

(a.) Both assertion and reason are correct and reason is the correct explanation of assertion.

(b.) Both assertion and reason are correct, but reason is not the correct explanation of assertion.

(c.) Assertion is correct, but reason is incorrect.

(d.) Both assertion and reason are incorrect.

(38.) Assertion: Interstitial fluid or tissue fluid has the same mineral distribution as that in plasma. Reasons: Exchange of nutrients, gases, etc. between the blood and the cells always occurs through tissue fluid (lymph).

(a.) Both assertion and reason are correct and reason is the correct explanation of assertion.

(b.) Both assertion and reason are correct, but reason is not the correct explanation of assertion.

(c.) Assertion is correct, but reason is incorrect.

(d.) Both assertion and reason are incorrect.

(39.) Heart is protected by a

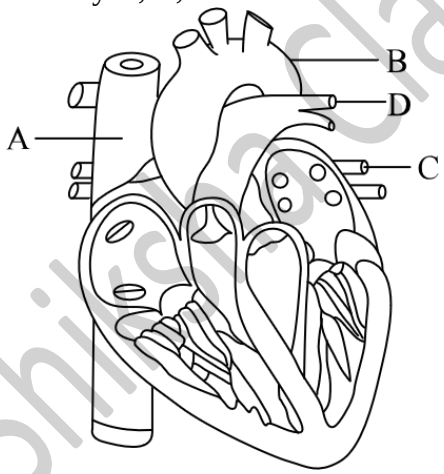
(a.) single walled membranous bag called pericardium

(b.) double walled membranous bag called peritoneum

(c.) single walled membranous bag called peritoneum

(d.) double walled membranous bag called pericardium

(40.) Identify A, B, C and D for a section of human heart.



(a.) A-Vena cava B-Aorta C-Pulmonary vein D-Pulmonary artery

(b.) A-Vena cava B-Pulmonary artery C-Pulmonary vein D-Bundle of his

(c.) A-Vena cava B-Pulmonary vein C-Pulmonary artery D-Bundle of his

(d.) A-Pulmonary vein B-Vena cava C-Pulmonary artery D-Bundle of his

(41.) Before the birth of a child, the major portion of blood from the right side bypasses the pulmonary circulation through _____in between right and left auricle and ____in between pulmonary and systemic aorta.

(a.) ductus arteriosus, foramenovale
(b.) fossa ovalis, ligamentum arteriosum
(c.) foramenovale, ductus arteriosus
(d.) ligamentum arteriosum, fossa ovalis

(42.) Which of the following is an incorrect statement?

(a.) Heart pumps with more force in old people than ayounger ones due to decreased elasticity of arteries.
(b.) Sino-atrial node (SNA) is called pacemaker.
(c.) Ventricular volume is more than atrial volume.
(d.) Nodal tissue is specialized cardiac musculature in human heart that has the ability to generate action potential due to stimuli (external).

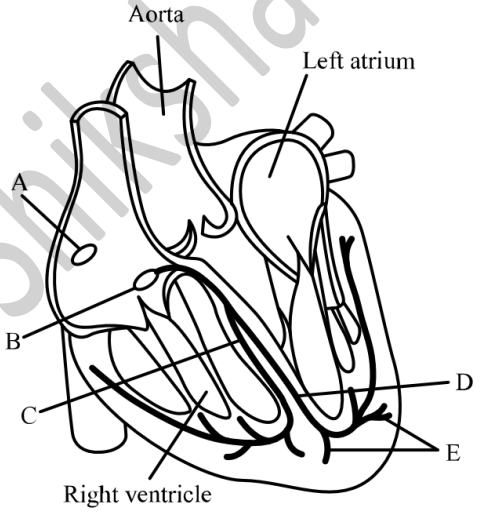
(43.) Purkinje fibres

(a.) are modified cardiac muscle fibres
(b.) originate from the atrio-ventricular node (AVN)
(c.) along with right and left bundles are known as bundle of His
(d.) are related to more than one options

(44.) The nodal musculature of heart

(a.) are auto excitable
(b.) like AVN initiates electrical impulse
(c.) like AVN generates maximum number of action potential
(d.) like SAN can generates maximum number of action potential, i.e., 45–55 min-1

(45.) Identify A, B, C, D and E in the human heart



(a.)	A – Site of generation of action potential	B – AV node	C – Right branch of bundle of his	D – Left branch of bundle of his	E – Purkinje fibres

(b.) A – SA node | B – Site of generation of action potential | C – Left branch of bundle of his | D – Right branch of bundle of his | E – Carry contraction impulse to ventricles

(c.)	A – AV bundle	B – SA node	C – Right branch of bundle of his	D – Left branch of bundle of his	E – Purkinje fibres

(d.)	A – SA node	B – AV node	C – Left branch of bundle of his	D – Right branch of bundle of his	E – Carry contraction impulse to ventricles

(46.) The cardiac impulse is initiated and conducted further up to ventricle The correct sequence of this conduction is

(a.) SA node→ AV node → Purkinje fibre → AV bundle

(b.) SA node→ Purkinje fibre → AV node → AV bundle

(c.) SA node→ AV node → AV bundle → Purkinje fibre

(d.) SA node→ Purkinje fibre → AV bundle → AV node

(47.) A person with stroke volume 50 mL per beat with 72 heart beats per minute will have the cardiac output of

(a.) 360 mL

(b.) 3600 mL

(c.) 7200 mL

(d.) 5000 mL

(48.) All the components of the nodal tissue are auto excitable. Why does the SA node act as the normal pacemaker?

(a.) SA node has the lowest rate of depolarization.

(b.) SA node is the only component to generate the threshold potential.

(c.) Only SA node can convey the action potential to the other components.

(d.) SA node has the highest rate of depolarization.

(49.) A specialized nodal tissue embedded in the lower corner of the right atrium, close to atrio-ventricular septum, delays the spreading of impulses to heart apex for about 0.1 second. The delays allows

(a.) blood to enter aorta

(b.) the ventricles to empty completely

(c.) blood to enter pulmonary arteries

(d.) the atria to empty completely

(50.) The papillary muscles are found in

(a.) pulmonary valves

(b.) ventricles

(c.) pulmonary valves and atrio-ventricular valves

(d.) atrio-ventricular valves

ANSWER

(1.)	b	**(2.)**	d	**(3.)**	a	**(4.)**	d	**(5.)**	c
(6.)	a	**(7.)**	d	**(8.)**	c	**(9.)**	b	**(10.)**	c
(11.)	c	**(12.)**	b	**(13.)**	a	**(14.)**	a	**(15.)**	d
(16.)	a	**(17.)**	c	**(18.)**	a	**(19.)**	d	**(20.)**	a
(21.)	d	**(22.)**	c	**(23.)**	b	**(24.)**	d	**(25.)**	d
(26.)	d	**(27.)**	d	**(28.)**	c	**(29.)**	a	**(30.)**	b
(31.)	c	**(32.)**	d	**(33.)**	b	**(34.)**	d	**(35.)**	a
(36.)	c	**(37.)**	a	**(38.)**	b	**(39.)**	d	**(40.)**	a
(41.)	c	**(42.)**	d	**(43.)**	d	**(44.)**	a	**(45.)**	a
(46.)	c	**(47.)**	b	**(48.)**	d	**(49.)**	d	**(50.)**	b

EXPLANATION

(1.) (b.) Blood is a liquid connective tissue. It contains formed elements which represents the cellular protein.
(2.) (d.) A–2, B–3, C–1
(3.) (a.) Adult RBCs are enucleate due to adaptation that allows it to contain more haemoglobin and carry more oxygen by providing empty space.
(4.) (d.) Thrombocytes are blood platelets which are responsible for blood clotting. Thus, their reduction can be dangerous.
(5.) (c.) Serum differs from blood in lacking clotting factors.
(6.) (a.) A healthy individual has 12–14 g of Hb/100 mL of blood. All blood cells are not nucleated. Platelets are included under formed elements along with RBCs and WBCs.
(7.) (d.) All options holds true for the characteristics of erythrocytes is RBCs.
(8.) (c.) A healthy human has on an average 5–5.5 million of RBCs mm3 of blood.
(9.) (b.) CO_2 is carried by haemoglobin as carbaminohaemoglobin.
(10.) (c.) Basophils are not associated with phagocytic activity like monocytes, neutrophils and macrophages. Basophils are involved in allergic reactions, thus cause inflammation.
(11.) (c.) The low platelet count leads to life threatening condition and is one of the most common symptoms observed in people infected with dengue fever.
(12.) (b.) Calcium ions and various platelet factors are essential for blood coagulation.
(13.) (a.) RBCs in humans lack nucleus. Absence of nucleus in the cell reduces the oxygen consumption by the cell in various cellular activities. Therefore, the cell is able to transport maximum amount of O_2 to other cells of the body.
(14.) (a.) B-lymphocytes function is to make antibodies against soluble antigens that are important for acquired immunity.
(15.) (d.) Lymphocytes are leucocytes which do not have granules, i.e., agranular. These lymphocytes are of two types, i.e., B-lymphocytes and T-lymphocytes, both of which are responsible for generation of immune response.
(16.) (a.) Leucocytes lifespan ranges from 3–4 hours to 8–12 days only. They are nucleated cells.
(17.) (c.) Neutrophils are 60%–65% of total WBCs. Basophils are 0.5%–1% of total WBCs.
(18.) (a.) Diapedesis is the movement of leucocytes out of the circulatory system.
(19.) (d.) The second most abundant type of leucocyte is lymphocyte.
(20.) (a.) Monocytes are the largest leucocyte.
(21.) (d.) Option (d.) is incorrect as monocytes are phagocytic and lymphocytes produce immune response.
(22.) (c.) Blood group is designated on the basis of the presence of antigen (not antibodies) on the cell surface. Like if antigen 'A' is present it is blood group -A, and so on.
(23.) (b.) A–3, B–1, C–4, D–2
(24.) (d.) People with blood group O are universal donors as they lack A and B antigens.
(25.) (d.) Statements III and IV are incorrect as nearly 80% of human population is Rh positive and the Rhantigen of the Rh positive foetus gets exposed to the Rh positive blood of the mother in her second pregnancy.
(26.) (d.) Ca^{2+} ions plays a very important role in blood clotting cascade.
(27.) (d.) A – Thrombokinase, B – Ca^{2+}, C – Thrombin, D – Ca2
(28.) (c.) Thrombin converts soluble fibrinogen of plasma into insoluble fibrin.

(29.) (a.) The proteolytic enzyme which causes lysis of fibrin during fibrinolysis is plasmin.
(30.) (b.) The correct statements are erythroblastosis foetalis occurs due to Rh-incompatibility and can be avoided by the administration of anti Rh-antibodies. The percentage share of WBCs in blood is Neutrophils → Lymphocytes → Monocytes → Eosinophils → Basophils.
(31.) (c.) The correct sequence is IV → III → I → V → II
(32.) (d.) Lymph returns the tissue fluid back to the cardiovascular system and brings CO_2 and other metabolic waste from the body cells and dump it these into the venous system.
(33.) (b.) An elaborate network of vessels called lymphatic system collects lymph/tissue fluid and drains it back to the major veins.
(34.) (d.) Thymus, spleen, tonsils, Peyer's batches, etc. are all lymphoid organs.
(35.) (a.) Lymph in comparison possess more waste material and less protein.
(36.) (c.) The RBCs of the person of 'O' blood group have no antigens; hence, this blood can be donated to people of all the blood groups. Thus, they are also known as universal donors.
(37.) (a.) Leucocytes are also known as white blood cell (WBC) as they are colourless due to lack of haemoglobin.
(38.) (b.) Interstitial fluid or tissue fluid has the same mineral distribution as that in plasma because it is formed due to leakage from extracellular fluid, i.e., blood (formed elements + plasma) into the tissues. Exchange of nutrients, gases, etc. between the blood and the cells always occurs through tissue fluid (lymph).
(39.) (d.) Heart is protected by a double walled membranous bag called pericardium.
(40.) (a.) A-Vena cava B-Aorta C-Pulmonary vein D-Pulmonary artery
(41.) (c.) Foramen ovale is present in a foetal heart between right and left auricle and a ductus arteriosus between pulmonary and systemic aorta.
(42.) (d.) Nodal tissue is a specialized cardiac musculature in human heart that can generate action potential due to internal stimuli.
(43.) (d.) Purkinje fibres are modified cardiac muscle fibres originated from AVN.
(44.) (a.) The nodal musculature of heart are autoexcitable.
(45.) (a.) A-site of action potential, B-AV node, C-right branch of bundle of His, D-left branch of bundle of His, E-Purkinje fibres.
(46.) (c.) The correct sequence is SA node → AV node → AV bundle → Purkinje fibre
(47.) (b.) Cardiac output = Heart beat × Stroke volume = 72 beats/min × 50 mL/beat = 3600 mL approx/min
(48.) (d.) SA node has the highest rate of depolarization, i.e., an ability to contract heart muscles.
(49.) (d.) AVN in the lower corner of the right atrium delays the spreading of impulses to heart ventricles for about 0.1 second. This pause allows the atria to empty completely into the ventricles before the ventricles pump out the blood.
(50.) (b.) The papillary muscles are found in ventricles.