Solutions

S1. Ans.(d)

Correct answer is option (d) because the correct pathway of conduction of action potential is

SA → AV node → AV bundle → Bundle branches → Purkinje fibres

S2. Ans.(a)

The correct answer is option no. (a) as

A.	P wave	III.	Depolarisation of atria.
B.	QRS complex	II.	Depolarisation of ventricles.
C.	T wave	IV.	Repolarisation of ventricles.
D.	T-P gap	I.	Heart muscles are electrically silent.

S3. Ans.(d)

Genotype of father with blood group

B+ = IBi/iIB

Genotype of mother with blood group

A+ = IAi/iIA

Genotype of child with blood group

O+ = ii

Hence only 'A' is correct.

S4. Ans.(d)

An ECG (Electrocardiogram) is a test

that measures the electrical activities of the heart. Each wave in An ECG represents a certain. Part of the heart's electrical activity.

S5. Ans.(c)

This questions asks to match types of

white blood cells (List) with their usual proportion in the blood (List II). The correct matching are :

Eosinophils (A)-typically make up 1-6%

of white blood cells, so the best match is (1) 6-8%

Lymphocytes (B) -typically make up 20-

40% of white blood cells, but none of the options are in this range. However since the other cells have more fitting matches, the remaining percentage (III) 20-25% would be the best fit.

S6. Ans.(d)

P-wave : Depolarization of atria

Q- wave : Beginning of systole

QRS complex : Depolarisation of ventricles

T -wave : Repolarisation of ventricles

S7. Ans.(b)

Statements B is correct. Basophils do

secrete histamine, serotonin, and heparin, Histamine and serotonin are involved in inflammatory response, while heparin is an anticoagulant.

Statement C is also correct. Basophils are involved in the inflammatory response. They release chemicals such as histamine and serotonin that dilate blood vessels and attract other white blood cells to the site of inflammation.

S8. Ans.(c)

Option (c) is the correct answer because

hepatic portal system is a unique vascular connection between digestive tract and liver.

S9. Ans.(d)

Option (d) is the correct answer because

coagulum or not is formed mainly. A network of threads called fibrins. Hence statements I is incorrect.

RBCs are destroyed in the spleen so spleen is known as the graveyard of erythrocytes. Hence , statements II is correct.

S10. Ans.(c)

Option (c) is the correct answer because during joint diastole, blood moves freely from atrium to ventricles as atrioventocular valve remain open during joint diastole.

S11. Ans.(d)

Fibrins are formed by the conversion of inactive fibrinogens in the plasma by the enzyme thrombin.

S12. Ans.(c)

Persons with 'AB' group can accept blood from persons with AB as well as the other groups of blood because they do not have anti A and anti B antibodies in their blood plasma.

S13. Ans.(b)

The depolarization of the ventricles which initiates ventricular contraction is shown by the QRS complex in a normal ECG.

S14. Ans.(d)

Histaminase, destructive enzymes are released by eosinophils. Histamine-releasing granules are released by basophils. Phagocytosis is a type of

phagocytosis that occurs in neutrophils. Immune response is performed by lymphocytes.

S15. Ans.(a)

Parasympathetic neural signals (another component of the ANS) reduce heart rate, speed of action potential conduction and hence cardiac output.

S16. Ans.(a)

Rh antibodies from the mother (Rh^{-ve}) can leak into the blood of the foetus (Rh^{+ve}) and kill the foetal RBCs

throughout subsequent pregnancies. The foetus could die as a result, or the newborn could develop severe anaemia and jaundice. Erythroblastosis foetalis is the name for this disorder.

S17. Ans.(c)

Cardiac output = Stroke volume × Heart rate Cardiac output = 5 litres or 5000 millilitres At the end of diastole, the blood volume in the ventricles is equal to 100 ml. At the end of systole,

the blood volume in the ventricles is 50 ml.

Stroke Volume = EDV-ESV

As a result, the stroke volume is equal to 100 – 50 = 50 ml.

As a result, 5000 ml = 50 ml × Heart rate i.e. 100 beats per minute is the heart rate

S18. Ans.(a)

P-wave in an ECG represents atria depolarization. The depolarization of the ventricles is represented by the QRS complex. T-wave indicates ventricular

repolarization, or the transition from an excited to a normal condition. Insufficient oxygen supply, i.e.

coronary ischemia, is indicated by a reduction in the size of the T-wave.

S19. Ans.(a)

Tricuspid valve is a three-cusp muscle flap that connects the right atrium and right ventricle. Backflow from the left ventricle to the left atrium is prevented by the bicuspid valve which is a

bimuscular flap. The semilunar valve controls blood flow between the right ventricle and the pulmonary artery.

S20. Ans.(d)

The action of thrombin, a clotting enzyme, converts fibrinogen to fibrin. These fibrin coagulate the blood

by forming a fibrous network. Globulin makes up a considerable portion of the proteins in blood serum and are primarily involved in the defense mechanism. Albumin helps to maintain plasma's colloid osmotic pressure.

S21. Ans.(a)

In the bone marrow, the biconcave mammalian erythrocyte is formed. Following synthesis, the nucleus is removed in a process known as enucleation. The lack of a nucleus permits red blood cells to hold more haemoglobin, freeing up all of their internal space for oxygen transfer to the body's tissues. They do not demonstrate any metabolic activity or multiplication because they do not have any organelles.

S22. Ans.(d)

Hepatic portal system contains the hepatic portal vein which transports blood from the intestine to the liver before delivering it to the systemic circulation.

S23. Ans.(d)

SAN is in charge of initiating and maintaining the heart's rhythmic contractile activity which can generate up to 70-75 action potentials each minute. As a result, it is known as the pacemaker.

S24. Ans.(d)

The delay is crucial because it allows all of the blood from the atria to reach the ventricles.

S25. Ans.(a)

Serum is plasma lacking the clotting factors.

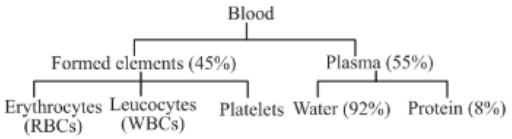
S26. Ans.(c)

The pulmonary artery has a higher blood pressure than the pulmonary vein.

S27. Ans.(a)

Due to attempted blood backflow, ventricular systole raises pressure, causing the tricuspid and bicuspid valves to close. As ventricular pressure rises, the semilunar valves that protect the pulmonary artery and aorta are forced to open, allowing blood to flow through the ventricles.

S28. Ans.(b)



S29. Ans.(b)

In the early foetal development, erythropoiesis is started in the yolk sac. After a few months it takes place in the spleen and liver. After birth, erythropoiesis is taking place in red bone marrow.

S30. Ans.(b)

Blood circulation in mammals is divided into two types: pulmonary and systemic.

Pulmonary circulation is between the heart and lungs. Systemic circulation is between the heart and the other organs.

S31. Ans.(c)

Globulins are largely involved in the body's defense processes.

S32. Ans.(b)

Two distinct sound are emitted throughout each heart cycle which can be heard with a stethoscope.

The closure of the tricuspid and bicuspid valves is connected with the first heart sound (lub). The closing of the semilunar valves is associated with the second heart sound (dub).

S33. Ans.(b)

P waves in the ECG represent atria depolarization which causes both atria to contract.

S34. Ans.(a)

The cation K^+ is the most abundant intracellularly.