

Body Fluids and Circulation — NEET Biology PYQ (2005-2021)

Class 11 Biology · 42 real NEET & AIPMT questions, year-tagged · answers checked by RankUp

NEET 2021

1. Persons with 'AB' blood group are called as "Universal recipients". This is due to :

- (A) Absence of antigens A and B on the surface of RBCs
- (B) Absence of antigens A and B in plasma
- (C) Presence of antibodies, anti-A and anti-B, on RBCs
- (D) Absence of antibodies, anti-A and anti-B, in plasma

NEET 2021

2. Which enzyme is responsible for the conversion of inactive fibrinogens to fibrins ?

- (A) Thrombin
- (B) Renin
- (C) Epinephrine
- (D) Thrombokinase

NEET 2020 · Q75

3. The QRS complex in a standard ECG represents:

- (A) Repolarisation of auricles
- (B) Depolarisation of auricles
- (C) Depolarisation of ventricles
- (D) Repolarisation of ventricles

NEET 2020 · Q76

4. Match the following columns and select the correct option.

Column - I | Column - II

(a) Eosinophils | (i) Immune response

(b) Basophils | (ii) Phagocytosis

(c) Neutrophils | (iii) Release histaminase, destructive enzymes

(d) Lymphocytes | (iv) Release granules containing histamine

- (A) (a)-iii, (b)-iv, (c)-ii, (d)-i
- (B) (a)-iv, (b)-i, (c)-ii, (d)-iii
- (C) (a)-i, (b)-ii, (c)-iv, (d)-iii
- (D) (a)-ii, (b)-i, (c)-iii, (d)-iv

NEET 2019 · Q105

5. Match the Column - I with Column - II :

(a) P - wave — (i) Depolarisation of ventricles

(b) QRS complex — (ii) Repolarisation of ventricles

(c) T - wave — (iii) Coronary ischemia

(d) Reduction in the size of T - wave — (iv) Depolarisation of atria

(v) Repolarisation of atria

Select the correct option.

- (A) (a)-(iv), (b)-(i), (c)-(ii), (d)-(iii)
- (B) (a)-(iv), (b)-(i), (c)-(ii), (d)-(v)
- (C) (a)-(ii), (b)-(i), (c)-(v), (d)-(iii)
- (D) (a)-(ii), (b)-(iii), (c)-(v), (d)-(iv)

NEET 2019 · Q130

6. What would be the heart rate of a person if the cardiac output is 5 L, blood volume in the ventricles at the end of diastole is 100 mL and at the end of ventricular systole is 50 mL ?

- (A) 50 beats per minute
- (B) 75 beats per minute
- (C) 100 beats per minute
- (D) 125 beats per minute

NEET 2018 · Q137

7. Match the items given in Column I with those in Column II and select the correct option given below:

Column I: a. Tricuspid valve, b. Bicuspid valve, c. Semilunar valve

Column II: i. Between left atrium and left ventricle, ii. Between right ventricle and pulmonary artery, iii. Between right atrium and right ventricle

- (A) a-i, b-ii, c-iii
- (B) a-i, b-iii, c-ii
- (C) a-iii, b-i, c-ii
- (D) a-ii, b-i, c-iii

NEET 2018 · Q166

8. Match the items given in Column I with those in Column II and select the correct option given below:

Column I: a. Fibrinogen, b. Globulin, c. Albumin

Column II: i. Osmotic balance, ii. Blood clotting, iii. Defence mechanism

- (A) a-i, b-iii, c-ii
- (B) a-i, b-ii, c-iii
- (C) a-iii, b-ii, c-i
- (D) a-ii, b-iii, c-i

NEET 2017 · Q70

9. The hepatic portal vein drains blood to liver from:

- (A) Heart
- (B) Stomach
- (C) Kidneys
- (D) Intestine

NEET 2017 · Q74

10. Adult human RBCs are enucleate. Which of the following statement(s) is/are most appropriate explanation for this feature?

- (a) They do not need to reproduce**
- (b) They are somatic cells**
- (c) They do not metabolize**
- (d) All their internal space is available for oxygen transport**

- (A) Only (d)
- (B) Only (a)
- (C) (a), (c) and (d)
- (D) (b) and (c)

NEET 2017 (Gujarati paper) · Q86

11. All the components of the conducting system can generate an action potential for the contraction of heart muscle, but the sino-atrial node acts as the pacemaker because:

- (A) All the other components in heart cannot conduct the action potential.
- (B) Only the sino-atrial node is auto-excitabile and auto-rhythmic.
- (C) The sino-atrial node has a higher inherent rate of depolarisation.
- (D) The sino-atrial node has a lower inherent rate of depolarisation.

NEET 2017 (Gujarati paper) · Q111

12. In the heart, as the action potential reaches the AV node from the SA node, there is a delay of the action potential. This delay is important because:

- (A) It allows atria to rest.
- (B) It allows a stronger right atrial contraction.
- (C) It allows ventricles to receive all the blood from the atria.
- (D) It allows right atria to receive the blood from vena cava.

NEET 2016 Phase 2 · Q152

13. 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

NEET 2016 Phase 2 · Q155

14. Serum differs from blood in

- (A) lacking globulins
- (B) lacking albumins
- (C) lacking clotting factors
- (D) lacking antibodies

NEET 2016 Phase 1 · Q161

15. Blood pressure in the pulmonary artery is:

- (A) same as that in the aorta.
- (B) more than that in the carotid.
- (C) more than that in the pulmonary vein.
- (D) less than that in the venae cavae.

AIPMT 2015

16. Which one of the following is correct?

- (A) Blood = Plasma + RBC + WBC + Platelets
- (B) Plasma = Blood – Lymphocytes
- (C) Serum = Blood + Fibrinogen
- (D) Lymph = Plasma + RBC + WBC

AIPMT 2015

17. Blood pressure in the mammalian aorta is maximum during:

- (A) Diastole of the right atrium
- (B) Systole of the left atrium
- (C) Diastole of the right ventricle
- (D) Systole of the left ventricle

AIPMT 2014

18. How do parasympathetic neural signals affect the working of the heart?

- (A) Heart rate is increased without affecting the cardiac output
- (B) Both heart rate and cardiac output increase
- (C) Heart rate decreases but cardiac output increases
- (D) Reduce both heart rate and cardiac output

AIPMT 2014

19. Person with blood group AB is considered as universal recipient because he has:

- (A) both A and B antibodies in the plasma
- (B) no antigen on RBC and no antibody in the plasma
- (C) both A and B antigens in the plasma but no antibodies
- (D) both A and B antigens on RBC but no antibodies in the plasma

AIPMT 2012 Mains

20. Which one of the following human organs is often called the "graveyard" of RBCs?

- (A) Gall bladder
- (B) Kidney
- (C) Spleen
- (D) Liver

AIPMT 2012 Prelims

21. A certain road accident patient with unknown blood group needs immediate blood transfusion. His one doctor friend at once offers his blood. What was the blood group of the donor ?

- (A) Blood group A
- (B) Blood group B
- (C) Blood group AB
- (D) Blood group O

AIPMT 2012 Prelims

22. Compared to those of humans, the erythrocytes in frog are

- (A) Nucleated and without haemoglobin
- (B) Without nucleus but with haemoglobin
- (C) Nucleated and with haemoglobin
- (D) Very much smaller and fewer

AIPMT 2011 Mains

23. Frogs differ from humans in possessing

- (A) Nucleated red blood cells
- (B) Thyroid as well as parathyroid
- (C) Paired cerebral hemispheres
- (D) Hepatic portal system

AIPMT 2011 Prelims

24. A person with unknown blood group under ABO system, has suffered much blood loss in an accident and needs immediate blood transfusion. His one friend who has a valid certificate of his own blood type, offers for blood donation without delay. What would have been the type of blood group of the donor friend?

- (A) Type A
- (B) Type B
- (C) Type AB
- (D) Type O

AIPMT 2011 Prelims

25. Arteries are best defined as the vessels which

- (A) Carry blood from one visceral organ to another visceral organ
- (B) Supply oxygenated blood to the different organs
- (C) Carry blood away from the heart to different organs
- (D) Break up into capillaries which reunite to form a vein

AIPMT 2011 Prelims

26. 'Bundle of His' is a part of which one of the following organs in humans?

- (A) Pancreas
- (B) Brain
- (C) Heart
- (D) Kidney

AIPMT 2011 Prelims

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

- (A) Fibrinogen
- (B) An albumin
- (C) Serum amylase
- (D) A globulin

AIPMT 2011 Prelims

28. Which one of the following statements is correct regarding blood pressure?

- (A) 190/110 mmHg may harm vital organs like brain and kidney
- (B) 130/90 mmHg is considered high and requires treatment
- (C) 100/55 mmHg is considered an ideal blood pressure
- (D) 105/50 mmHg makes one very active

AIPMT 2010 Mains · Q3

29. Fastest distribution of some injectible material/medicine and with no risk of any kind can be achieved by injecting it into the

- (A) Muscles
- (B) Arteries
- (C) Veins
- (D) Lymph vessels

AIPMT 2010 Mains · Q25

30. Given below are four statements (a-d) regarding human blood circulatory system

(a) Arteries are thick-walled and have narrow lumen as compared to veins

(b) Angina is acute chest pain when the blood circulation to the brain is reduced

(c) Persons with blood group AB can donate blood to any person with any blood group under ABO system

(d) Calcium ions play a very important role in blood clotting

Which two of the above statements are correct?

- (A) (a) & (d)
- (B) (a) & (b)
- (C) (b) & (c)
- (D) (c) & (d)

AIPMT 2010 Mains · Q27

31. The haemoglobin content per 100 ml of blood of a normal healthy human adult is

- (A) 5 - 11 g
- (B) 25 - 30 g
- (C) 17 - 20 g
- (D) 12 - 16 g

AIPMT 2010 Prelims · Q146

32. If due to some injury the chordae tendinae of the tricuspid valve of the human heart is partially non-functional, what will be the immediate effect?

- (A) The flow of blood into the pulmonary artery will be reduced
- (B) The flow of blood into the aorta will be slowed down
- (C) The pacemaker will stop working
- (D) The blood will tend to flow back into the left atrium

AIPMT 2009 Prelims · Q70

33. The most popularly known blood grouping is the ABO grouping. It is named ABO and not ABC, because O in it refers to having:

- (A) overdominance of this type on the genes for A and B types
- (B) one antibody only – either anti-A or anti-B on the RBCs
- (C) no antigens A and B on RBCs
- (D) other antigens besides A and B on RBCs

AIPMT 2009 Prelims · Q76

34. Compared to blood our lymph has:

- (A) plasma without proteins
- (B) more WBCs and no RBCs
- (C) more RBCs and less WBCs
- (D) no plasma

AIPMT 2009 Prelims · Q117

35. In a standard ECG which one of the following alphabets is the correct representation of the respective activity of the human heart?

- (A) S – start of systole
- (B) T – end of diastole
- (C) P – depolarisation of the atria
- (D) R – repolarisation of ventricles

AIPMT 2009 Prelims · Q130

36. Globulins contained in human blood plasma are primarily involved in:

- (A) osmotic balance of body fluids
- (B) oxygen transport in the blood
- (C) clotting of blood
- (D) defence mechanisms of body

AIPMT 2008 Prelims · Q144

37. Which type of white blood cells are concerned with the release of histamine and the natural anticoagulant heparin?

- (A) Monocytes
- (B) Neutrophils
- (C) Basophils
- (D) Eosinophils

AIPMT 2008 Prelims · Q155

38. The most active phagocytic white blood cells are

- (A) Neutrophils and monocytes
- (B) Neutrophils and eosinophils
- (C) Lymphocytes and macrophages
- (D) Eosinophils and lymphocytes

AIPMT 2008 Prelims · Q157

39. In humans, blood passes from the post caval to the diastolic right atrium of heart due to

- (A) Pressure difference between the post caval and atrium
- (B) Pushing open of the venous valves
- (C) Suction pull
- (D) Stimulation of the sino auricular node

AIPMT 2007 Prelims · Q105

40. If you suspect major deficiency of antibodies in a person, to which of the following would you look for confirmatory evidence?

- (A) serum globulins
- (B) fibrinogen in the plasma
- (C) haemocytes
- (D) serum albumins

41. A drop of each of the following, is placed separately on four slides. Which of them will not coagulate?

- (A) blood serum
- (B) sample from the thoracic duct of lymphatic system
- (C) whole blood from pulmonary vein
- (D) blood plasma

42. Which of the following substances, if introduced in the blood stream, would cause coagulation, at the site of its introduction ?

- (A) Fibrinogen
- (B) Prothrombin
- (C) Heparin
- (D) Thromboplastin

Answer key and explanations

1. Answer: (D) Absence of antibodies, anti-A and anti-B, in plasma

People with AB blood have both A and B antigens on their RBCs and therefore make neither anti-A nor anti-B antibodies in plasma, so donor RBCs of any group are not attacked. The antigens are present, not absent, on their RBCs.

2. Answer: (A) Thrombin

Thrombin converts soluble inactive fibrinogen into fibrin threads that form the clot. Thrombokinase acts one step earlier, converting prothrombin into thrombin.

3. Answer: (C) Depolarisation of ventricles

The QRS complex marks depolarisation of the ventricles, which starts ventricular contraction. The P wave is atrial depolarisation, the T wave is ventricular repolarisation, and atrial repolarisation is hidden in the QRS and has no separate wave.

4. Answer: (A) (a)-iii, (b)-iv, (c)-ii, (d)-i

Eosinophils resist infection and are linked to allergy (release of histaminase and destructive enzymes), basophils release granules with histamine, serotonin and heparin, neutrophils are phagocytic, and lymphocytes carry out immune responses. Hence histaminase, histamine, phagocytosis, immune response is correct.

5. Answer: (A) (a)-(iv), (b)-(i), (c)-(ii), (d)-(iii)

The P-wave is atrial depolarisation, the QRS complex is ventricular depolarisation and the T-wave is ventricular repolarisation. A reduced or flattened T-wave indicates coronary ischemia; atrial repolarisation is hidden in the QRS complex and is not matched to any wave.

6. Answer: (C) 100 beats per minute

Stroke volume = end-diastolic volume – end-systolic volume = 100 – 50 = 50 mL. Heart rate = cardiac output ÷ stroke volume = 5000 mL ÷ 50 mL = 100 beats per minute. Using the 72 beats/min resting value or dividing by 100 mL gives the wrong answer.

7. Answer: (C) a-iii, b-i, c-ii

The tricuspid valve guards the opening between the right atrium and right ventricle, the bicuspid (mitral) valve lies between the left atrium and left ventricle, and a semilunar valve guards the exit from the right ventricle into the pulmonary artery. Swapping the tricuspid and bicuspid sides is the usual error.

8. Answer: (D) a-ii, b-iii, c-i

Fibrinogen is converted to fibrin during blood clotting, globulins (including antibodies) are mainly involved in the defence mechanisms of the body, and albumin maintains the osmotic balance of blood.

9. Answer: (D) Intestine

The hepatic portal vein carries blood from the intestine to the liver before it reaches the systemic circulation, so absorbed nutrients are processed first. Blood from the heart reaches the liver through the hepatic artery, and kidneys drain into the renal veins.

10. Answer: (A) Only (d)

Losing the nucleus leaves the whole biconcave cell free to be packed with haemoglobin, so it can carry the most oxygen. RBCs do metabolise (they run glycolysis), and being somatic or non-dividing does not explain why the nucleus is lost.

11. Answer: (C) The sino-atrial node has a higher inherent rate of depolarisation.

The SA node generates the maximum number of action potentials per minute (about 70-75), so it sets the rhythm for the whole heart. Other nodal tissue such as the AV node is also autoexcitable but fires more slowly, so it is not true that only the SA node is autorhythmic.

12. Answer: (C) It allows ventricles to receive all the blood from the atria.

The short AV-nodal delay lets the atria finish contracting and push their blood into the ventricles before ventricular systole begins. It does not make atrial contraction stronger or serve atrial filling from the venae cavae.

13. Answer: (D) Thrombocytes

Thrombocytes (platelets) release factors needed for blood coagulation, so too few of them cause clotting disorders and heavy blood loss. Erythrocytes carry gases, and leucocytes, including neutrophils, are involved in defence.

14. Answer: (C) lacking clotting factors

Serum is plasma from which the clotting factors such as fibrinogen have been removed by clotting. It still has albumins and globulins, including antibodies.

15. Answer: (C) more than that in the pulmonary vein.

The pulmonary artery receives blood pumped by the right ventricle, so its pressure (about 25/8 mm Hg) is higher than in the pulmonary vein returning blood to the left atrium. It is much lower than systemic arterial pressure in the aorta or carotid, and higher than in the venae cavae.

16. Answer: (A) Blood = Plasma + RBC + WBC + Platelets

Blood is plasma plus the formed elements: RBCs, WBCs and platelets. Serum is plasma without clotting factors, and lymph has no RBCs, so the other equations are wrong.

17. Answer: (D) Systole of the left ventricle

The left ventricle pumps blood into the aorta, so aortic pressure reaches its peak (systolic pressure, about 120 mm Hg) during left ventricular systole. Atrial contraction only tops up the ventricles and does not raise aortic pressure.

18. Answer: (D) Reduce both heart rate and cardiac output

Parasympathetic (vagal) signals slow the SA node and AV conduction, so heart rate falls and with it the cardiac output. Increases in heart rate or cardiac output are caused by sympathetic stimulation, not parasympathetic.

19. Answer: (D) both A and B antigens on RBC but no antibodies in the plasma

A person with AB blood has both A and B antigens on the RBCs and no anti-A or anti-B antibodies in the plasma, so donor RBCs of any ABO group are not agglutinated. Antigens are on the RBC surface, not in plasma, and group O (not AB) has no antigens.

20. Answer: (C) Spleen

The spleen filters the blood and destroys old, worn-out RBCs, earning the name 'graveyard of RBCs'. The liver breaks down haemoglobin products but is not the organ called the graveyard.

21. Answer: (D) Blood group O

Blood group O has no A or B antigens on its RBCs, so it can be given to a patient of any ABO group; O is the universal donor. Group AB is the universal recipient, not donor.

22. Answer: (C) Nucleated and with haemoglobin

Frog erythrocytes are nucleated and contain haemoglobin, unlike the enucleate RBCs of mammals. They are also larger, not smaller, than human RBCs.

23. Answer: (A) Nucleated red blood cells

Frog RBCs are nucleated, while mature human RBCs lack a nucleus. Both frogs and humans have thyroid and parathyroid glands, paired cerebral hemispheres and a hepatic portal system.

24. Answer: (D) Type O

Blood group O red cells carry neither the A nor the B antigen, so they are not agglutinated by the recipient's antibodies: O is the universal donor. Since the patient's group is unknown, only O blood can safely be given without delay; AB is the universal recipient, not donor.

25. Answer: (C) Carry blood away from the heart to different organs

An artery is defined by the direction of flow: it carries blood away from the heart to the organs. Not all arteries carry oxygenated blood (the pulmonary artery carries deoxygenated blood), so oxygen content does not define them.

26. Answer: (C) Heart

The bundle of His (AV bundle) is part of the conducting system of the heart: it arises from the AV node, runs through the interventricular septum and divides into right and left bundle branches.

27. Answer: (A) Fibrinogen

Fibrinogen is the plasma protein converted by thrombin into fibrin threads, which form the network of a clot. Albumins maintain osmotic balance and globulins serve in defence; amylase is an enzyme, not a clotting factor.

28. Answer: (A) 190/110 mmHg may harm vital organs like brain and kidney

Normal blood pressure is about 120/80 mmHg, and repeated readings of 140/90 or higher indicate hypertension. A pressure of 190/110 mmHg is severe and can damage vital organs such as the brain and kidneys. Readings like 100/55 or 105/50 are on the low side, not ideal or energising.

29. Answer: (C) Veins

An intravenous injection puts the drug straight into venous blood, which returns to the heart and is pumped all over the body within seconds. Arteries carry blood at high pressure, so puncturing them is risky, and intramuscular injection only releases the drug slowly from the muscle. Lymph flow is very slow.

30. Answer: (A) (a) & (d)

Arteries have thick muscular walls and a narrow lumen compared with veins, and Ca^{2+} ions are needed at several steps of the clotting cascade. Angina is chest pain caused by too little oxygen reaching the heart muscle, not the brain, and AB individuals are universal recipients, while O is the universal donor.

31. Answer: (D) 12 - 16 g

NCERT states that a healthy adult has 12-16 g of haemoglobin in every 100 ml of blood. Values of 5-11 g would indicate anaemia, and 17-20 g or more are above the normal range.

32. Answer: (A) The flow of blood into the pulmonary artery will be reduced

Chordae tendineae stop the tricuspid valve from turning inside out during ventricular systole. If they fail, part of the right ventricle's blood leaks back into the right atrium, so less is pumped into the pulmonary artery. The left atrium is on the other side of the heart (the bicuspid valve), so backflow there is not the effect.

33. Answer: (C) no antigens A and B on RBCs

Group O red cells carry neither antigen A nor antigen B on their surface, so 'O' stands for the absence (zero) of these antigens. The O allele is recessive, not overdominant, and antibodies are in the plasma, not on the RBCs.

34. Answer: (B) more WBCs and no RBCs

Lymph is tissue fluid drained into lymphatic vessels; it has no RBCs and is rich in lymphocytes (WBCs). It does contain plasma with fewer proteins, so 'plasma without proteins' and 'no plasma' are wrong.

35. Answer: (C) P - depolarisation of the atria

In an ECG the P-wave represents electrical excitation (depolarisation) of the atria, leading to atrial contraction. The QRS complex is ventricular depolarisation and the T-wave is ventricular repolarisation, so R is not repolarisation.

36. Answer: (D) defence mechanisms of body

NCERT states that globulins are primarily involved in the defence mechanisms of the body (antibodies are gamma globulins). Albumins maintain osmotic balance and fibrinogen helps in clotting.

37. Answer: (C) Basophils

Basophils secrete histamine, serotonin and heparin and take part in inflammatory reactions, as NCERT states. Eosinophils resist infections and are linked to allergies but are not the source of heparin.

38. Answer: (A) Neutrophils and monocytes

NCERT states that neutrophils and monocytes (which become macrophages) are phagocytic cells that destroy foreign organisms. Lymphocytes are responsible for immune responses, not phagocytosis.

39. Answer: (A) Pressure difference between the post caval and atrium

During atrial diastole the pressure in the right atrium falls below that in the venae cavae, so blood flows down this pressure gradient into the atrium. SA node stimulation starts contraction (systole), not the filling of a relaxed atrium.

40. Answer: (A) serum globulins

Antibodies are immunoglobulins, which belong to the globulin fraction of plasma proteins, so a low serum globulin level would confirm antibody deficiency. Albumins mainly maintain osmotic balance and fibrinogen is a clotting protein, so neither reflects antibody levels.

41. Answer: (A) blood serum

Serum is plasma from which fibrinogen and other clotting factors have been removed, so it cannot clot. Plasma, whole blood and lymph still contain fibrinogen and will coagulate.

42. Answer: (D) Thromboplastin

Thromboplastin (tissue factor) starts the clotting cascade, which leads to thrombin formation and turns fibrinogen into fibrin, so a clot forms where it is introduced. Fibrinogen and prothrombin already circulate in plasma without clotting, and heparin is an anticoagulant.

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