Body Fluids and Circulation

Question1

A person with blood group ARh- can receive the blood transfusion from which of the following types?

A. BRh-

B. $ABRh^{-}$

C. ORh^{-}

D. ARh^{-}

E. ARh^{+}

Choose the correct answer from the options given below :

[NEET 2024 Re]

Options:

A.

D and E only

B.

D only

C.

A and B only

D.

C and D only

Answer: D

Solution:

The correct answer is option (4) because recipient is A blood group with Rh(−ve) antigen, hence cannot receive blood from any blood group with Rh(+ve) antigen and as A blood group individuals have anti-B antibodies in plasma. So, donor could be O(Rh − ve) and A(Rh − ve) only.

Options (1), (2) and (3) are not correct answers because B^{-}, AB^{-} and A^{+} blood groups will lead to serve clumping reaction.

Question2

Diuresis is prevented by:

[NEET 2024 Re]

Options:

A.

Renin from JG cell via switching off the osmoreceptors

B.

ANF from atria of the heart

C.

Aldosterone from adrenal medulla

D.

Vasopressin from Neurohypophysis

Answer: D

Solution:

The correct answer is option (4) because,

• Diuresis is prevented by vasopressin or anti-diuretic hormone from neurohypophysis or posterior pituitary. When there is excessive loss of fluid from the body the secretion of, ADH facilitates water reabsorption from latter part of renal tubules.

• Option (1) is incorrect because renin from JG cells convert angiotensinogen in blood to angiotensin I and further to angiotensin II; which is a powerful vasoconstrictor and increases the glomerular blood pressure and thereby GFR.

• Option (2) is incorrect because ANF causes vasodilation and thereby decrease GFR.

• Option (3) is incorrect because aldosterone is released from adrenal cortex and causes reabsorption of Na+ and water from distal parts of renal tubules.

Question3

'Lub' sound of Heart is caused by the _____.

[NEET 2024 Re]

Options:

A.

closure of the semilunar valves

B.

opening of tricuspid and bicuspid valves

C.

opening of the semilunar valves

D.

closure of the tricuspid and bicuspid valves

Answer: D

Solution:

The correct answer is option (4) because LUB is the first heart sound and it is produced by closing of AV valves; (tricuspid valve in between right atrium and right ventricle) and (bicuspid /mitral valve in between left atrium and left ventricle), during ventricular systole.

• Option (1) is incorrect as closure of the semilunar valves produce the second heart sound called 'DUB'.

• Option (2) is incorrect because opening of valves are not responsible for production of heart sounds 'LUB' and 'DUB'.

• Option (3) is incorrect because opening of semilunar valves does not produce only heart sounds.

Question4

Following are the stages of pathway for conduction of an action potential through the heart
A. AV bundle
B. Purkinje fibres
C. AV node
D. Bundle branches
E. SA node

Choose the correct sequence of pathway from the options given below

[NEET 2024]

Options:

A.

E-C-A-D-B

B.

A-E-C-B-D

C.

B-D-E-C-A

D.

E-A-D-B-C

Answer: A

Solution:

Correct answer is option (1) because the correct pathway of conduction of action potential is SA⟶ AV node ⟶ AV bundle ⟶ Bundle branches ⟶ Purkinje fibres

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Question5

Match List I with List II :

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

Choose the correct answer from the options given below :

[NEET 2024]

Options:

A.

A-I, B-III, C-IV, D-II

B.

A-III, B-II, C-IV, D-I

C.

A-II, B-III, C-I, D-IV

D.

A-IV, B-II, C-I, D-III

Answer: B

Solution:

The correct answer is option no. (2) 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 electricallysilent.

Question6

Match List I with List II.

List I	List II
A. P-wave	I. Beginning of systole
B. Q-wave	II. Repolarisation of ventricles
C. QRS complex	III. Depolarisation of atria
D. T-wave	IV. Depolarisation of ventricles

Choose the correct answer from the options given below :

[NEET 2023]

Options:

A.

A-IV, B-III, C-II, D-I

B.

A-II, B-IV, C-I, D-III

C.

A-I, B-II, C-III, D-IV

D.

A-III, B-I, C-IV, D-II

Answer: D

Solution:

Solution:

The correct answer is option (4) as in a standard ECG, P-wave represents the electrical excitation (or depolarisation) of the atria which leads to the contraction of both the atria.
• QRS complex represents the depolarisation of ventricles which initiates the ventricular contraction.
• T-wave represents the return of the ventricles from excited to normal state.

Question7

Which of the following statements are correct?
A. Basophils are most abundant cells of the total WBCs
B. Basophils secrete histamine, serotonin and heparin
C. Basophils are involved in inflammatory response
D. Basophils have kidney shaped nucleus
E. Basophils are agranulocytes

Choose the correct answer from the options given below:

[NEET 2023]

Options:

A.

C and E only

B.

B and C only

C.

A and B only

D.

D and E only

Answer: B

Solution:

Solution:

Option (2) is the answer because, basophils secrete histamine, serotonin, heparin etc. and are involved in inflammatory response.
Option (1) is not the answer because, basophils are granulocytes.
Option (3) is not the answer because, neutrophils are the most abundant cells (60 − 65%) of the total WBCs whereas basophils are least (0.5 − 1%) abundant of all WBCs.
Option (4) is not the answer because, monocytes have a kidney-shaped nucleus.

Question8

List - I (ECG)		List - II (Electrical activity of heart)	
(A)	P-wave	(I)	Depolarisation of ventricles
(B)	QRS complex	(II)	End of systole
(C)	T wave	(III)	Depolarisation of atria
(D)	End of T wave	(IV)	Repolarisation of ventricles

Choose the correct answer from the options given below :

[NEET 2023 mpr]

Options:

A.

A-(IV), B-(I), C-(III), D-(II)

B.

A-(I), B-(IV), C-(III), D-(II)

C.

A-(IV), B-(III), C-(I), D-(II)

D.

A-(III), B-(I), C-(IV), D-(II)

Answer: D

Solution:

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:

P wave : This wave occurs prior to the contraction of the atria (atrial contraction). It represents the depolarization of the atria.

QRS complex : This is a series of three graph deflections seen on a typical electrocardiogram. It corresponds to the depolarization of the ventricles, which initiates the ventricular contraction.

T wave : The T wave represents the repolarization (or recovery) of the ventricles.

By matching these descriptions with the options provided :
(A) P-wave - Depolarisation of atria (III)
(B) QRS complex - Depolarisation of ventricles (I)
(C) T wave - Repolarisation of ventricles (IV)
(D) End of T wave - End of systole (II)

Question9

List - I		List - II	
(A)	Eosinophils	(I)	6 - 8%
(B)	Lymphocytes	(II)	2 - 3%
(C)	Neutrophils	(III)	20 - 25%
(D)	Monocytes	(IV)	60 - 65%

Choose the correct answer from the options given below :

[NEET 2023 mpr]

Options:

A.

A-(IV), B-(I), C-(II), D-(III)

B.

A-(IV), B-(I), C-(III), D-(II)

C.

A-(II), B-(III), C-(IV), D-(I)

D.

A-(II), B-(III), C-(I), D-(IV)

Answer: C

Solution:

This question asks to match types of white blood cells (List I) with their usual proportion in the blood (List II). The correct matchings are :

Eosinophils (A) - typically make up 1-6% of white blood cells, so the best match is (I) 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.

Neutrophils (C) - these are the most common type of white blood cells, making up 50-70% of all white blood cells, so the best match is (IV) 60 - 65%

Monocytes (D) - typically make up 2-8% of white blood cells, so the best match is (II) 2 - 3%

Question10

A unique vascular connection between the digestive tract and liver is called
[NEET Re-2022]

Options:

A. Hepato-cystic system

B. Hepato-pancreatic system

C. Hepatic portal system

D. Renal portal system

Answer: C

Solution:

Solution:

Hepatic portal system is a specialised system that connects the digestive tract with the liver.

Question11

Arrange the following formed elements in the decreasing order of their abundance in blood in humans :
(a) Platelets
(b) Neutrophils
(c) Erythrocytes.
(d) Eosinophils
(e) Monocytes
Choose the most appropriate answer from the options given below :
[NEET Re-2022]

Options:

A. (a), (c), (b), (d), (e)

B. (c), (a), (b), (e), (d)

C. (c), (b), (a), (e), (d)

D. (d), (e), (b), (a), (c)

Answer: B

Solution:

- Erythrocytes/RBCs : $5-5.5$ million$/mm^3$

- Platelets : $1,50,000-3,50,000/mm^3$

- WBCs/Leukocytes :$6,000-8,000/mm^3$

Neutrophils : 60 to 65%

Lymphocytes : 20 to 25%

Monocytes : 6 to 8%

Eosinophils :2 to 3%

Basophils : 0.5 to 1%

Question12

Under normal physiological conditions in human being every 100ml of oxygenated blood can deliver ml of O_2 to the tissues.
[NEET-2022]

Options:

A. 2ml

B. 5ml

C. 4ml

D. 10ml

Answer: B

Solution:

Option (2) is the correct answer because every $100mL$ of oxygenated blood can deliver around $5mL$ of O_2 to the tissues under normal physiological conditions.

Option (3), (4) and (1) are incorrect because every $100mL$ of deoxygenated blood delivers approximately $4mL$ of CO_2 to the alveoli.

Question13

Which of the following is not a connective tissue? [NEET-2022]

Options:

A. Blood

B. Adipose tissue

C. Cartilage

D. Neuroglia

Answer: D

Solution:

Solution:

Option (4) is the correct answer as neuroglia are a part of nervous tissue.

• Neuroglia are the supportive cells of nervous tissue. They make up more than half the volume of neural tissue. Neurons, the unit of neural system are excitable cells.

• Cartilage and blood are specialised type of connective tissues.

• Adipose tissue is a type of loose connective tissue.

Question14

Which one of the following statements is correct? [NEET-2022]

Options:

A. The atrio-ventricular node (AVN) generates an action potential to stimulate atrial contraction

B. The tricuspid and the bicuspid valves open due to the pressure exerted by the simultaneous contraction of the atria

C. Blood moves freely from atrium to the ventricle during joint diastole.

D. Increased ventricular pressure causes closing of the semilunar valves.

Answer: C

Solution:

Option (3) is the correct answer because during joint diastole, blood moves freely from atrium to ventricle as atrioventricular valve remain open during joint diastole.

Option (4) is incorrect because decrease in ventricular pressure, during ventricular diastole closes semilunar valves to produce ‘dub’ heart sound.

Option (1) is incorrect because SA node generates action potential to stimulate atrial contraction.

Option (2) is incorrect because bicuspid and tricuspid valves open due to pressure exerted by blood present in atria and decrease in pressure in ventricles during ventricular diastole.

Question15

Match List-I with List-II

List-I (Biological Molecules)	List-II (Biological functions)
(a) Glycogen	(i) Hormone
(b) Globulin	(ii) Biocatalyst
(c) Steroids	(iii) Antibody
(d) Thrombin	(iv) Storage product

Choose the correct answer from the options given below: [NEET-2022]

Options:

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

B. (a) - (iv), (b) - (ii), (c) - (i), (d) - (iii)

C. (a) - (ii), (b) - (iv), (c) - (iii), (d) - (i)

D. (a) - (iv), (b) - (iii), (c) - (i), (d) - (ii)

Answer: D

Solution:

Solution:

Option (4) is the correct answer as glycogen is a polysaccharide and is a storage product in animals.

• Globulins form antibodies which are also known as immunoglobulins.

• Steroids form hormones like testosterone.

• Thrombin is a biocatalyst which converts soluble fibrinogen to insoluble fibrin.

Question16

Persons with 'AB' blood group are called as "Universal recipients". This is due to : [NEET 2021]

Options:

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

Answer: D

Solution:

Solution:
Option (4) is correct because persons with 'AB' blood group contain antigens 'A' and 'B' but lack antibodies anti-A and anti-B in plasma. So, persons with 'AB' blood group can accept blood from persons with AB as well as the other groups of blood due to lack of antibodies in their blood. Therefore, such persons are called "Universal recipients".

Question17

Which enzyme is responsible for the conversion of inactive fibrinogens to fibrins?
[NEET 2021]

Options:

A. Thrombin

B. Renin

C. Epinephrine

D. Thrombokinase

Answer: A

Solution:

Solution:
During coagulation of blood, an enzyme complex thrombokinase helps in the conversion of prothrombin (present in plasma) into thrombin.
Thrombin further helps in the conversion of inactive fibrinogens into fibrins which form network of threads.
Renin is secreted by JG cells in response to fall in glomerular blood flow, which converts angiotensinogen in blood to angiotensin-I
Epinephrine or adrenaline is secreted by adrenal medulla in response to stress of any kind and during emergency.

Question18

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

(2020)

Options:

A.

(a) (b) (c) (d)
(i) (ii) (iv) (iii)

B.

(a) (b) (c) (d)
(ii) (i) (iii) (iv)

C.

(a) (b) (c) (d)
(iii) (iv) (ii) (i)

D.

(a) (b) (c) (d)
(iv) (i) (ii) (iii)

Answer: C

Solution:

Solution:
(d) Option (d) is the correct answer because Eosinophils are associated with allergic reactions and release histaminase, Basophils secrete histamine, serotonin, heparin etc.
and are involved in inflammatory reactions,Neutrophils are phagocytic cells; Both B and T lymphocytes are responsible for immune responses of the body.

Question19

The QRS complex in a standard ECG represents
(2020)

Options:

A. Depolarisation of auricles

B. Depolarisation of ventricles

C. Repolarisation of ventricles

D. Repolarisation of auricles

Answer: B

Solution:

Solution:
(b) The QRS complex represents the depolarisation of the ventricles, which initiates the ventricular contraction. The contraction starts shortly after Q and marks the beginning of the systole.

Question20

All the components of the nodal tissue areautoexcitable. Why does the SA node act as the normal pacemaker?
[2019]

Options:

A. SA node has the highest rate of depolarisation.

B. SA node has the lowest rate of depolarisation.

C. SA node is the only component to generate the threshold potential.

D. Only SA node can convey the action potential to the other components.

Answer: A

Solution:

(a) SA node acts as pace-maker of heart because its autoexcitable tissue have the ability to generates heart impulses at highest rate(frequency).

Question21

A specialised nodal tissue embedded in the lower corner of the right atrium, close to Atrioventricular septum, delays the spreading of

impulses to heart apex for about 0.1 sec.
This delay allows [2019]

Options:

A. the atria to empty completely.

B. blood to enter aorta.

C. the ventricles to empty completely.

D. blood to enter pulmonary arteries.

Answer: A

Solution:

(a) The delay in transmission of impulse from SAN to the ventricles provided by AVN prevents simultaneous contraction of ventricles and auricles. This allows atria to empty completely before ventricles start contraction.

Question22

Match the Column-I with Column-II.

Column-I	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)	(B)	(C)	(D)
(a)	(iv)	(i)	(ii)	(iii)
(b)	(iv)	(i)	(ii)	(v)
(c)	(ii)	(i)	(v)	(iii)
(d)	(ii)	(iii)	(v)	(iv)

[2019]

Options:

A. (a)

B. (b)

C. (c)

D. (d)

Answer: A

Solution:

Solution:
(a) Electrocardiogram is a diagnostic tool, used to assess the electrical and muscular functions of the heart. It consists of waveform components which indicate electrical events during one heart beat. These waveforms are labelled P, Q, R, S, T and U.
• P wave indicates atrial depolarisation i.e. that the atria are contracting, pumping blood into the ventricles.
• The QRS complex represents ventricular depolarisation and contraction.
• T wave is upwards waveform representing ventricular repolarisation. The normal T wave is slightly asymmetric with a steeper downward slope. Reduction in the size of T wave represents insufficient supply of oxygen i.e. coronary ischemia. Coronary ischemia is an intermediate condition in coronary artery disease during which the heart tissue is slowly or suddenly starved of oxygen and other nutrients.

Question23

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?
[2019]

Options:

A. 50 beats per minute

B. 75 beats per minute

C. 100 beats per minute

D. 125 beats per minute

Answer: C

Solution:

(c) Cardiac output is the product of the heart rate (HR), or the number of heart beats per minute (bpm),and the stroke volume (SV), which is the volume of blood pumped from the ventricle per beat; thus,
Cardiac output = stroke volume × Heart rate As per the given information,
Cardiac output = 5L or 5000 ml Blood volume in ventricles at the end of diastole = 100 ml Blood volume in ventricles at the end of systole = 50 ml
Stroke volume = 100 – 50= 50 ml.
So,5000 ml = 50 ml × Heart rate So,
Heart rate = 100 beats per minute.

Question24

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

Column I	Column II
A. Fibrinogen	(i) Osmotic balance
B. Globulin	(ii) Blood clotting
C. Albumin	(iii) Defence mechanism

	A	B	C
(a)	(iii)	(ii)	(i)
(b)	(i)	(ii)	(iii)
(c)	(ii)	(iii)	(i)
(d)	(i)	(iii)	(ii)

[2018]

Options:

A. (a)

B. (b)

C. (c)

D. (d)

Answer: C

Solution:

Solution:
(c) Fibrinogen forms fibrin strands during coagulation. These strands forms a network and the meshes of which are occupied by blood cells, this structure finally forms a clot.

Question25

in Column II and select the correct option given below :

Column I	Column II
A. Tricuspid valve	i. Between leftatrium and leftventricle
B. Bicuspid valve	ii. Between rightventricle andpulmonary artery
C. Semilunar valve	iii. Between rightatrium and rightventricle

	A	B	C
(a)	iii	i	ii
(b)	i	iii	ii
(c)	ii	i	iii
(d)	i	ii	iii

[2018]

Options:

A. (a)

B. (b)

C. (c)

D. (d)

Answer: A

Solution:

Solution:
(a) Tricuspid valves are AV valve present between right atrium and right ventricle in heart. Bicuspid valves (mitral valves) are AV valve present between left atrium and left ventricle. Semilunar valves are present at the openings of aortic and pulmonary aorta.

Question26

Adult human RBCs are enucleate. Which of the following statement(s) is/are most appropriate explanation for this feature?
(1) They do not need to reproduce.
(2) They are somatic cells.
(3) They do not metabolise.
(4) All their internal space is available for oxygen transport.
(NEET 2017)

Options:

A. Only (1)

B. (1),(3) and (4)

C. (2) and (3)

D. Only (4)

Answer: D

Solution:

Solution:
(d) : Red blood cells of adult humans do not have cell organelles including nucleus, Golgi bodies, mitochondria, ribosomes, etc. It increases the surface area of RBCs and enables them to contain more haemoglobin (the oxygen carrying pigment).

Question27

The hepatic portal vein drains blood to liver from (NEET 2017)

Options:

A. stomach

B. kidneys

C. intestine

D. heart

Answer: C

Solution:

Solution:
Blood enters the liver from two sources. From the hepatic artery, it gets oxygenated blood and from the hepatic portal vein, it receives deoxygenated blood. Blood in the hepatic artery comes from the aorta. Blood in the hepatic portal vein comes directly from the intestine containing newly absorbed nutrients, stomach, etc.

Question28

Name the blood cells, whose reduction in number can cause clotting disorder, leading to excessive loss of blood from the body. (NEET II 2016)

Options:

A. Erythrocytes

B. Leucocytes

C. Neutrophils

D. Thrombocytes

Answer: D

Solution:

Solution:
(d) : Thrombocytes are called blood platelets. They are minute disc-shaped cell fragments in mammalian blood. They are formed as fragments of larger cells found in red bone marrow; they have no nucleus. They play an important role in blood clotting and release thromboxane A_2, serotonin and other chemicals, which cause a chain of events leading to the formation of a plug at the site of the damage, thus preventing further blood loss. A reduction in their number can lead to clotting factors which will lead to excessive loss of blood from the body.

Question29

Serum differs from blood in (NEET II 2016)

Options:

A. lacking globulins

B. lacking albumins

C. lacking cloting factors

D. lacking antibodies

Answer: C

Solution:

Solution:
(c) : Serum is the fluid that separates from blood plasma on centrifugation. Serum is essentially similar in composition to plasma but lacks fibrinogen and other substances that are used in the coagulation process.

Question30

Blood pressure in the pulmonary artery is (NEET I 2016)

Options:

A. more than that in the pulmonary vein

B. less than that in the venae cavae

C. same as that in the aorta

D. more than that in the carotid

Answer: A

Solution:

Solution:
(a) Arteries have higher blood pressure than vein because blood is forced inside them from heart and also their lumen is narrow.

Question31

In mammals, which blood vessel would normally carry largest amount of urea?
(NEET I 2016)

Options:

A. Hepatic Vein

B. Hepatic Portal Vein

C. Renal Vein

D. Dorsal Aorta

Answer: A

Solution:

Solution:
(a) : Hepatic vein carries largest amount of urea. Urea is produced in liver. Hepatic vein transports liver's deoxygenated blood to heart for oxygenation.

Question32

Which one of the following animals has two separate circulatory pathways?
(2015)

Options:

A. Whale

B. Shark

C. Frog

D. Lizard

Answer: A

Solution:

Solution:
(a) : Whale is a mammal and in mammals, two separate circulatory pathways are found - systemic circulation and pulmonary circulation. Oxygenated and deoxygenated bloods received by the left and right atria respectively pass on to the left and right ventricles. Thus, oxygenated and deoxygenated bloods are not mixed. This is referred to as double circulation.

Question33

Doctors use stethoscope to hear the sounds produced during each cardiac cycle. The second sound is heard when (2015)

Options:

A. AV node receives signal from SA node

B. AV valves open up

C. Ventricular walls vibrate due to gushing in of blood from atria

D. Semilunar valves close down after the blood flows into vessels from ventricles

Answer: D

Solution:

Solution:
(d) : Second heart sound i.e., dup is caused by the closure of the semilunar values and marks the end of ventricular systole.

Question34

Erythropoiesis starts in (2015 Cancelled)

Options:

A. spleen

B. red bone marrow

C. kidney

D. liver

Answer: B

Solution:

(b) : Erythropoiesis is the formation of red blood cells (erythrocytes) which occurs in the red bone marrow. Proerythroblast is the earliest precursor which gives rise successively to the early erythroblast, intermediate erythroblast and late erythroblast. Then, the nucleus is forced out and a biconcave, enucleated cell called reticulocyte is formed, which is released into blood. In blood, it develops into mature erythrocytes.

Question35

Which one of the following is correct? (2015 Cancelled)

Options:

A. Lymph = Pl asma + RBC + W BC

B. Bl ood = Pl asma + RBC + W BC + Platelets

C. Plasma = Blood - Lymphocytes

D. Serum = Blood + Fibrinogen

Answer: B

Solution:

(b): Lymph = Plasma + WBC
Plasma =blood − Cellular components
Serum = Plasma − Clotting factors

Question36

Blood pressure in the mammalian aorta is maximum during (2015 Cancelled)

Options:

A. systole of the left ventricle

B. diastole of the right atrium

C. systole of the left atrium

D. diastole of the right ventricle.

Answer: A

Solution:

(a) : The temporary rise in blood pressure during the contraction of the heart is called systolic pressure and the temporary fall in blood pressure during relaxation of the heart is called diastolic pressure. Blood pressure is expressed as the ratio of the systolic pressure over the diastolic pressure. For a healthy resting adult person, the average systolic/diastolic pressures are $120 / 80 \mathrm{mmH} \mathrm{g}$. Aorta is directly supplied by left ventricle thus, the blood pressure in aorta is highest during systole of left ventricle. During it, left ventricle contracts and pushes blood into aorta.

Question37

Person with blood group AB is considered as universal recipient because he has (2014)

Options:

A. both A and B antigens on RBC but no antibodies in the plasma

B. both A and B antibodies in the plasma

C. no antigen on RBC and no antibody in the plasma

D. both A and B antigens in the plasma but no antibodies.

Answer: A

Solution:

Solution:
(a) : Individuals with AB blood group have both antigen A and B on their RBCs, and no antibodies for either of the antigen in their plasma. Type O individuals are without A and B antigens on their RBCs, but have antibodies for both these antigens in their plasma. Individuals with blood group AB can receive blood of A, B or O group, while those with blood group O can donate blood to anyone.

Question38

How do parasympathetic neural signals affect the working of the heart? (2014)

Options:

A. Reduce both heart rate and cardiac output.

B. Heart rate is increased without affecting the cardiac output.

C. Both heart rate and cardiac output increase.

D. Heart rate decreases but cardiac output increases.

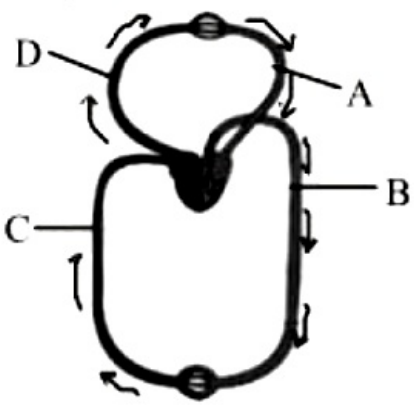
Answer: A

Solution:

(a) : A special neural centre in medulla oblongata can moderate the cardiac function through autonomic nervous system (ANS). Neural signals through the sympathetic nerves (part of ANS) can increase the rate of heart beat, the strength of ventricular contraction and thereby the cardiac output. Parasympathetic neural signals (component of ANS) decrease the rate of heart beat, speed of conduction of action potential and thereby the cardiac output.

Question39

The given figure shows schematic plan of blood circulation in humans with labels A to D. Identify the label and give its functions?



(NEET 2013)

Options:

A. C - Vena cava - takes blood from body parts to right auricle, pCO_2 = 45mmH g

B. D - Dorsal aorta - takes blood from heart to body parts, pO_2 = 95mmH g

C. A - Pulmonary vein - takes impure blood from body parts, pO_2 = 60mmH g

D. B - Pulmonary artery - takes blood from heart to lungs, pO_2 = 90mmH g

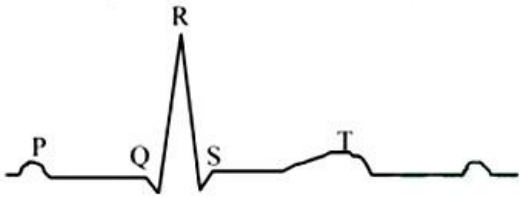
Answer: A

Solution:

Solution:
(a) : In the given figure: A is pulmonary vein which brings pure blood from lungs to left atrium, B is dorsal aorta which carries blood from heart to body parts, C is vena cava which carries impure blood from body parts to right auricle, and D is pulmonary artery which takes impure blood from heart to lungs.

Question40

The diagram given here is the standard ECG of a normal person. The P-wave represents the



(NEET 2013)

Options:

A. beginning of the systole

B. end of systole

C. contraction of both the atria

D. initiation of the ventricular contraction

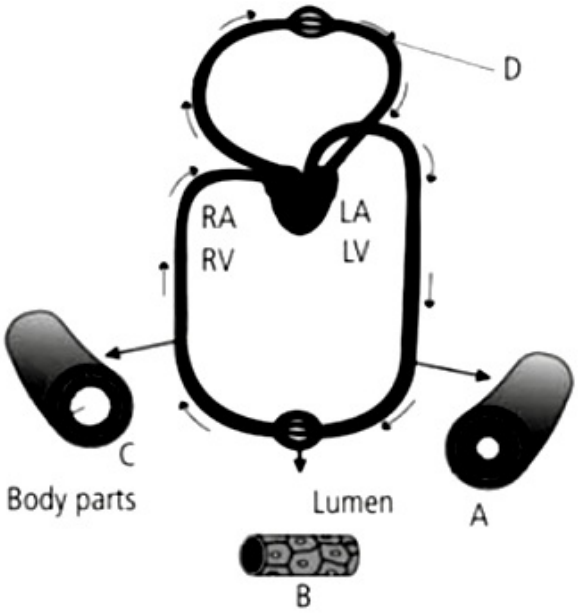
Answer: C

Solution:

(c) : In the given diagram the P-wave represents the electrical excitation (or depolarisation) of the atria, which leads to the contraction of both the atria. The QRS complex represents the depolarisation of the ventricles, which initiates the ventricular contraction. The contraction starts shortly after Q and marks the beginning of the systole. The T-wave represents the return of the ventricles from excited to normal state (repolarisation). The end of the T-wave marks the end of systole.

Question41

The figure shows blood circulation in humans with labels A to D. Select the option which gives correct identification of label and functions of the part.



(KN NEET 2013)

Options:

A. B-Capillary-Thin without muscle layer and wall two cell layers thick

B. C - Vein-Thin walled and blood flows in jerks/spurts

C. D - Pulmonary vein-Takes oxygenated blood to heart, pO_2 = 95mmH g

D. A - Artery-Thick walled and blood flows evenly

Answer: C

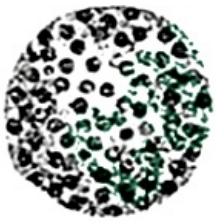
Solution:

(c) : A- Artery : Carries blood from heart to different body parts. It is thick-walled and elastic. The flow of blood in it is intermittent.

B - Capillary : Nutrients, hormones, gases etc. can diffuse into tissue cells through capillaries and vice versa. It is thin-walled, and only one layer thick resting on basement membrane.
C - Vein : Brings blood from different body parts to the heart. It is thin-walled and acts as low-resistance conduct for blood flow.
D - Pulmonary vein : Two pulmonary veins from each lung transport the oxygenated blood to the left atrium.

Question42

The figure shows a human blood cell. Identify it and give its characteristics.



Blood cell Characteristics

	Blood cell	Characterstics
(a)	Basophil	Secretes serotonin, inflammatory response
(b)	B-lymphocyte	Forms about 20% of blood cells involved in immune response
(c)	Neutrophil	Most abundant blood cells, phagocytic
(d)	Monocyte	Life span of 3 days, produces antibodies

(KN NEET 2013)

Options:

A. (a)

B. (b)

C. (c)

D. (d)

Answer: A

Solution:

(a) : Basophils have nucleus which is three-lobed and have less number of coarse granules. Their granules take basic stain and release heparin, histamine and serotonin.

Question43

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?
(2012)

Options:

A. Blood group B

B. Blood group AB

C. Blood group O

D. Blood group A

Answer: C

Solution:

(c) : The blood group was O. The person having O blood group is universal donor. It lacks both antigens 'A'and 'B' thus does not cause agglutination or clumping of blood cells when transfused into person with any of the four blood groups.

Question44

Which one of the following human organs is often called the "graveyard" of RBCs?
(Mains 2012)

Options:

A. Gall bladder

B. Kidney

C. Spleen

D. Liver

Answer: C

Solution:

(c) : Spleen is a vertebrate organ, lying behind the stomach, that is basically a collection of lymphoid tissue. Its functions include producing lymphocytes and destroying foreign particles. It acts as a reservoir for RBCs and can regulate the number in circulation. It is also the site for the breakdown of worn out RBCs and thus is known as graveyard of RBCs.

Question45

'Bundle of His' is a part of which one of the following organs in

humans?
(2011)

Options:

A. Brain

B. Heart

C. Kidney

D. Pancreas

Answer: B

Solution:

Solution:
(b) : 'Bundle of His' is a part of heart. A bundle of nodal fibres, atrioventricular bundle (AV bundle), continues from the atrioventricular node (AVN) and passes through the atrioventricular septa. It emerges on the top of the interventricular septum and immediately divides into a right and left bundle, which give rise to minute fibres throughout the ventricular musculature of the respective sides called Purkinje fibres. These fibres along with right and left bundles are known as Bundle of His.

Question46

Which one of the following plasma proteins is involved in the coagulation of blood?
(2011)

Options:

A. Albumin

B. Serum amylase

C. Globulin

D. Fibrinogen

Answer: D

Solution:

Solution:
(d) : Blood plasma is a faint yellow, slightly alkaline and somewhat viscous fluid. The plasma contains a number of proteins: serum albumin, serum globulins, properdin, prothrombin and fibrinogen. Prothrombin and fibrinogen play a role in blood clotting.

Question47

Arteries are best defined as the vessels which (2011)

Options:

A. supply oxygenated blood to the different organs

B. carry blood away from the heart to different organs

C. break up into capillaries which reunite to form a vein

D. carry blood from one visceral organ to another visceral organ

Answer: B

Solution:

Solution:
(b) : Arteries and veins are main blood vessels. Arteries carry blood from the heart to different body parts. Veins bring blood from different body parts to the heart.

Question48

Which one of the following statements is correct regarding blood pressure? (2011)

Options:

A. 130 / 90 mm Hg is considered high and requires treatment.

B. 100 / 55mmH g is considered an ideal blood pressure.

C. 105 / 50 mm Hg makes one very active.

D. 190 / 110 mm Hg may harm vital organs like brain and kidney

Answer: D

Solution:

Solution:
(d) : If repeated checks of blood pressure of an individual is 140 / 90 or higher, it shows hypertension or high blood pressure. It leads to heart diseases and also affects vital organs like brain and kidney.

Question49

A person with unknown blood group under ABO system, has suffered much blood loss in an accident and needs immediate blood transfusion.

His friend who has 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?
(2011)

Options:

A. Type B

B. Type AB

C. Type O

D. Type A

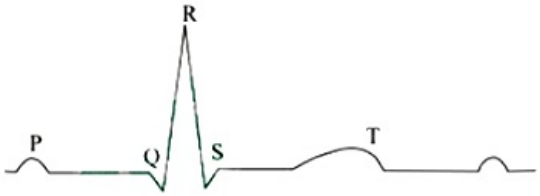
Answer: C

Solution:

Solution:
(c) : The blood group was O. The person having O blood group is universal donor. It lacks both antigens 'A'and 'B' thus does not cause agglutination or clumping of blood cells when transfused into person with any of the four blood groups.

Question50

Given below is the ECG of a normal human. Which one of its components is correctly interpreted below?



(Mains 2011)

Options:

A. Complex QRS - one complete pulse

B. Peak T - initiation of total cardiac contraction

C. Peak P and peak R together - systolic and diastolic blood pressures

D. Peak P- initiation of left atrial contraction only

Answer: A

Solution:

Solution:
(a) : By counting the number of QRS complexes that occur in a given time period, one can determine the heart beat rate (pulse) of an individual. The QRS complex represents the depolarisation of the ventricles, which initiates the ventricular contraction.

Question51

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?
(2010)

Options:

A. The flow of blood into the aorta will be slowed down

B. The 'pacemaker' will stop working

C. The blood will tend to flow back into the left atrium

D. The flow of blood into the pulmonary artery will be reduced

Answer: D

Solution:

Solution:
(d) : Tricuspid valve is the valve in the heart between the right atrium and right ventricle. It consists of three cusps that channel the flow of blood from the atrium to the ventricle. When the right ventricle contracts, forcing blood into the pulmonary artery, the tricuspid valve closes the aperture to the atrium, thereby preventing any back flow of blood. The valve reopens to allow blood to flow from the atrium into the ventricle. Thus, if tricuspid valve is partially nonfunctional the flow of blood into the pulmonary artery will be reduced.

Question52

Which two of the following changes (i -iv) usually tend to occur in the plain dwellers when they move to high altitudes (3, 500m or more)?
(i) Increase in red blood cell size
(ii) Increase in red blood cell production
(iii) Increased breathing rate
(iv) Increase in thrombocyte count Changes occurring are
(2010)

Options:

A. (ii) and (iii)

B. (iii) and (iv)

C. (i) and (iv)

D. (i) and (ii)

Answer: A

Solution:

Solution:
(a) : The body undergoes numerous changes at higher elevation in order to increase oxygen delivery to cells and improve efficiency of oxygen use. The early changes includes increased breathing rate, increased heart rate and fluid shifts. The later changes includes increased red blood cell production, increased 2,3 DPG production and increased number of capillaries.

Question53

Fastest distribution of some injectible material/ medicine and with no risk of any kind can be achieved by injecting it into the
(Mains 2010)

Options:

A. muscles

B. arteries

C. veins

D. lymph vessels

Answer: C

Solution:

Solution:
(c) : Intravenous injection is given for rapid distribution of drugs/substance. Intra-muscular injection is given for producing local effect.

Question54

Given below are four statements (i-iv) regarding human blood circulatory system.
(i) Arteries are thick-walled and have narrow lumen as compared to veins.
(ii) Angina is acute chest pain when the blood circulation to the brain is reduced.
(iii) Persons with blood group AB can donate blood to any person with any blood group under ABO system.
(iv) Calcium ions play a very important role in blood clotting.
Which two of the above statements are correct?
(Mains 2010)

Options:

A. (i) and (iv)

B. (i) and (ii)

C. (ii) and (iii)

D. (iii) and (iv)

Answer: A

Solution:

(a) : The term angina means chest pain. In this disease enough oxygen does not reach the heart muscles. The patient experiences heart pain usually in front of the chest.
AB blood group person have both antigens A and B, but do not have antibodies in the plasma. Due to the presence of both the antigens, AB blood group person cannot donate blood to anyone. However, the person can receive blood from any blood group as it has no antibodies. Thus, AB blood group is a universal recipient.

Question55

The haemoglobin content per 100 ml of blood of a normal healthy human adult is
(Mains 2010)

Options:

A. 5 − 11mg

B. 25 − 30mg

C. 17 − 20mg

D. 12 − 16mg

Answer: D

Question56

There is no DNA in
(2009)

Options:

A. mature RBCs

B. a mature spermatozoan

C. hair root

D. an enucleated ovum.

Answer: A

Solution:

Solution:
(a) : Red blood cells are the most common type of blood cell and delivering oxygen to the body tissues via the blood. There is no DNA in mature RBC. The reticulocyte which is the immediate precursor of the mature RBC evolves into mature RBC within 24 hours of release into the peripheral circulation.

Question57

In a standard ECG which one of the following alphabets is the correct representation of the respective activity of the human heart? (2009)

Options:

A. S - start of systole

B. T - end of diastole

C. P - depolarisation of the atria

D. R - repolarisation of ventricles

Answer: C

Solution:

Solution:
(c) : In the given diagram the P-wave represents the electrical excitation (or depolarisation) of the atria, which leads to the contraction of both the atria. The QRS complex represents the depolarisation of the ventricles, which initiates the ventricular contraction. The contraction starts shortly after Q and marks the beginning of the systole. The T-wave represents the return of the ventricles from excited to normal state (repolarisation). The end of the T-wave marks the end of systole.

Question58

Globulins contained in human blood plasma are primarily involved in (2009)

Options:

A. osmotic balance of body fluids

B. oxygen transport in the blood

C. clotting of blood

D. defence mechanisms of body.

Answer: D

Solution:

Solution:
(d) : Globulins in human blood plasma are primarily involved in defence mechanisms of body. Globulins like immunoglobulins act as antibodies that destroy bacteria, viruses and toxic substances that may enter into the blood from outside.

Question59

Compared to blood our lymph has (2009)

Options:

A. plasma without proteins

B. more W BCs and no RBCs

C. more RBCs and less W BCs

D. no plasma.

Answer: B

Solution:

(b): Lymph = Plasma + WBC
Plasma =blood − Cellular components
Serum = Plasma − Clotting factors

Question60

In humans, blood passes from the post caval to the diastolic right atrium of heart due to (2008)

Options:

A. stimulation of the sino auricular node

B. pressure difference between the post caval and atrium

C. pushing open of the venous valves

D. suction pull

Answer: B

Solution:

Solution:
(b) : Due to the pressure difference between the post caval and atrium, the blood passes from the post caval to the diastolic right atrium. Diastolic right atrium has less pressure and post caval has high pressure, thus blood moves from post caval to right atrium.

Question61

The most active phagocytic white blood cells are (2008)

Options:

A. eosinophils and lymphocytes

B. neutrophils and monocytes

C. neutrophils and eosinophils

D. Iymphocytes and macrophages

Answer: B

Solution:

Solution:
(b) : Phagocytes are cells that are able to engulf and breakdown foreign particles, cell debris and disease producing microorganisms. Neutrophils and monocytes (type of white blood cells) are the most active phagocytic cells.

Question62

Which type of white blood cells are concerned with the release of histamine and the natural anticoagulant heparin? (2008)

Options:

A. Eosinophils

B. Monocytes

C. Neutrophils

D. Basophils

Answer: D

Solution:

Basophils have nucleus which is three-lobed and have less number of coarse granules. Their granules take basic stain and release heparin, histamine and serotonin.

Question63

A drop of each of the following, is placed separately on four slides. Which of them will not coagulate? (2007)

Options:

A. Blood serum

B. Sample from the thoracic duct of lymphatic system

C. Whole blood from pulmonary vein

D. Blood plasma

Answer: A

Solution:

Solution:
(a) : Blood serum is blood plasma from which the fibrin and clotting factors have been removed by centrifugation or vigorous stirring, so that it cannot clot. Serum containing a specific antibody or antitoxin may be used in the treatment or prevention of certain infections. Such serum is generally derived from a nonhuman mammal (e.g., a horse).

Question64

Which one of the following has an open circulatory system? (2006)

Options:

A. Octopus

B. Pheretima

C. Periplaneta

D. Hirudinaria

Answer: C

Solution:

(c) : Periplaneta has open circulatory system i.e., the blood does not flow in blood vessels but flows in a haemocoel (body cavity). The circulatory systems of all vertebrates, as well as of annelids (for example, earthworms) and cephalopods (squid and Octopus) are closed, in which the blood never leaves the system of blood vessels consisting of arteries, capillaries and veins.

Question65

You are required to draw blood from a patient and to keep it in a test tube for analysis of blood corpuscles and plasma. You are also providedwith the following four types of test tubes. Which of these you will not use for the purpose?
(2006)

Options:

A. Test tube containing calcium bicarbonate

B. Chilled test tube

C. Test tube containing heparin

D. Test tube containing sodium oxalate

Answer: C

Solution:

Solution:
(c) : Clotting of collected blood can be prevented by -
(i) coating test tubes with silicon (which produce non wettable surface similar in its smoothness to endothelial lining of blood vessels).
(ii) adding chelating agents (includes trisodium citrate, sodium oxalate and sodium EDTA) which remove calcium which is important for blood coagulation, and prevent blood clotting.
(iii) adding heparin, most powerful anticoagulant which acts indirectly by activating plasma antithrombin III. Heparin is effective both in vivo and in vitro whereas the option a, b and d are effective in vitro.
Heparinized blood is not suitable for blood counts (as it alters the shape of RBCs and WBCs which affects blood testing), Fragility testing and complement fixation tests. Hence (c) is the correct answer.

Question66

The cardiac pacemaker in a patient fails to function normally. The doctors find that an artificial pacemaker is to be grafted in him. It is likely that it will be grafted at the site of
(2003)

Options:

A. atrioventricular bundle

B. Purkinje system

C. sinuatrial node

D. atrioventricular node

Answer: C

Solution:

(c) : SA (sinoatrial) node is a specialised bundle of neurons located in the upper part of the right atrium of the heart. SA node is the natural cardiac pacemaker from which the heart beat originates. If this system is damaged, it may send non-coordinated impulses to the heart chambers resulting in symptoms like irregular heart rate, tiredness, dizziness and loss of consciousness. As the pacemaker cells create these rhythmical impulse therefore an artificial pacemaker is implanted at the site of SA node to mimic the actions of the node and conducting system and helps to regulate heart beat.

Question67

Bundle of His is a network of (2003)

Options:

A. muscle fibres distributed throughout the heart walls

B. muscle fibres found only in the ventricle wall

C. nerve fibres distributed in ventricles

D. nerve fibres found throughout the heart

Answer: B

Solution:

Solution:
(b) : 'Bundle of His' is a part of heart. A bundle of nodal fibres, atrioventricular bundle (AV bundle), continues from the atrioventricular node (AVN) and passes through the atrioventricular septa. It emerges on the top of the inter ventricular septum and immediately divides into a right and left bundle, which give rise to minute fibres throughout the ventricular musculature of the respective sides called Purkinje fibres. These fibres along with right and left bundles are known as Bundle of His.

Question68

In the ABO system of blood groups, if both antigens are present but no antibody, the blood group of the individual would be (2003)

Options:

A. B

B. O

C. AB

D. A.

Answer: C

Solution:

Solution:
(c) : Individuals with AB blood group have both antigen A and B on their RBCs, and no antibodies for either of the antigen in their plasma. Type O individuals are without A and B antigens on their RBCs, but have antibodies for both these antigens in their plasma. Individuals with blood group AB can receive blood of A,B or O group, while those with blood group O can donate blood to anyone.

Question69

Impulse of heart beat originates from (2002)

Options:

A. SA node

B. AV node

C. vagus nerve

D. cardiac nerve

Answer: A

Solution:

(a) : SA (sinoatrial) node is a specialised bundle of neurons located in the upper part of the right atrium of the heart. SA node is the natural cardiac pacemaker from which the heart beat originates. If this system is damaged, it may send non-coordinated impulses to the heart chambers resulting in symptoms like irregular heart rate, tiredness, dizziness and loss of consciousness. As the pacemaker cells create these rhythmical impulse therefore an artificial pacemaker is implanted at the site of SA node to mimic the actions of the node and conducting system and helps to regulate heart beat.

Question70

Which of the following statements is true for lymph? (2002)

Options:

A. W BC + serum

B. Blood - RBCs and some proteins

C. RBCs + W BCs + plasma

D. RBCs + proteins + platelets

Answer: B

Solution:

(b): Lymph = Plasma + WBC
Plasma =blood − Cellular components
Serum = Plasma − Clotting factors

Question71

What is correct for blood group O?
(2001)

Options:

A. No antigens but both a and b antibodies are present

B. A antigen and b antibody present

C. Antigen and antibody both absent

D. A and B antigens and a, b antibodies present

Answer: A

Solution:

(a) : Individuals with AB blood group have both antigen A and B on their RBCs, and no antibodies for either of the antigen in their plasma. Type O individuals are without A and B antigens on their RBCs, but have antibodies for both these antigens in their plasma. Individuals with blood group AB can receive blood of A,B or O group, while those with blood group O can donate blood to anyone.

Question72

Difference between pulmonary artery and pulmonary vein is that, the pulmonary artery has
(2000)

Options:

A. no endothelium

B. valves

C. thicker walls

D. oxygenated blood.

Answer: C

Solution:

Solution:
(c) : An artery has thick and more elastic wall but its lumen is narrow as compared to vein. Pulmonary artery carries deoxygenated blood from the right ventricle to the lungs for oxygenation. Pulmonary vein carries oxygenated blood from the lungs to the left auricle.

Question73

In which point, pulmonary artery is different from pulmonary vein? (2000)

Options:

A. Its lumen is broad.

B. Its wall is thick.

C. It has valves.

D. It does not possess endothelium

Answer: B

Solution:

Solution:
(b) : The pulmonary artery carries deoxygenated blood from the heart to the lungs while the pulmonary vein carries oxygenated blood from the lungs to the heart. A pulmonary artery has a smaller lumen and thicker walls as compared to a pulmonary vein. Thus, the correct answer is 'Its wall is thick.'

Question74

Which statement is true for WBC? (2000)

Options:

A. Non-nucleated

B. In deficiency, cancer is caused

C. Manufactured in thymus

D. Can squeeze through blood capillaries

Answer: D

Solution:

Solution:
(d) : WBCs are the colourless nucleated amoeboid cells that can squeeze through blood capillaries by a process known as diapedesis. The increase in their number causes leukaemia, a cancer. WBCs are of two types, granulocytes (formed in bone marrow) and a granulocytes (formed in bone marrow and thymus).

Question75

Rate of heart beat is determined by (1999)

Options:

A. Purkinje fibres

B. papillary muscles

C. AV node

D. SA node

Answer: D

Solution:

Solution:
(d) : SA (sinoatrial) node is a specialised bundle of neurons located in the upper part of the right atrium of the heart. SA node is the natural cardiac pacemaker from which the heart beat originates. If this system is damaged, it may send non-coordinated impulses to the heart chambers resulting in symptoms like irregular heart rate, tiredness, dizziness and loss of consciousness. As the pacemaker cells create these rhythmical impulse therefore an artificial pacemaker is implanted at the site of SA node to mimic the actions of the node and conducting system and helps to regulate heart beat.

Question76

Which is the principal cation in the plasma of the blood? (1999)

Options:

A. Potassium

B. Magnesium

C. Calcium

D. Sodium

Answer: D

Solution:

(d) : Blood consists of a watery fluid called plasma. Plasma is a faint yellow, slightly alkaline, viscous fluid. It consists of 90% water, 1% inorganic salts, 7% or 8% proteins and 1% of other substances. The inorganic salts in plasma occur as ions. Sodium is the main cation of plasma and chloride, the main anion. Potassium, calcium and magnesium occur in small amount.

Question77

The blood group, with antibody- A and antibody-B is (1999)

Options:

A. O

B. B

C. A

D. AB

Answer: A

Solution:

Solution:
(a) : Individuals with AB blood group have both antigen A and B on their RBCs, and no antibodies for either of the antigen in their plasma. Type O individuals are without A and B antigens on their RBCs, but have antibodies for both these antigens in their plasma. Individuals with blood group AB can receive blood of A,B or O group, while those with blood group O can donate blood to anyone.

Question78

The thickening of walls of arteries is called (1999)

Options:

A. arteriosclerosis

B. arthritis

C. aneurysm

D. both (b) and (c)

Answer: A

Solution:

Solution:
(a) : Arteriosclerosis is the hardening of arteries and arterioles due to thickening of the fibrous tissue, and the consequent loss of elasticity. In this disease, calcium salts precipitate with the cholesterol. This calcification ultimately makes the wall of arteries stiff and rigid.

Question79

An adult human with average health has systolic and diastolic pressures as
(1998)

Options:

A. 120mmH g and 80mm Hg

B. 50mmH g and 80mmH g

C. 80mmH g and 80mmH g

D. 70mmH g and 420mmH g

Answer: A

Solution:

Solution:
(a) : The temporary rise in blood pressure during the contraction of the heart is called systolic pressure and the temporary fall in blood pressure during relaxation of the heart is called diastolic pressure. Blood pressure is expressed as the ratio of the systolic pressure over the diastolic pressure. For a healthy resting adult person, the average systolic/diastolic pressures are 120/80mmHg. Aorta is directly supplied by left ventricle thus, the blood pressure in aorta is highest during systole of left ventricle. During it, left ventricle contracts and pushes blood into aorta

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Question80

Which of the following is not the main function of lymph glands?
(1998)

Options:

A. Forming RBCs

B. Destroying bacteria

C. Forming WBCs

D. Forming antibodies

Answer: A

Solution:

Solution:
(a) : Formation of WBCs, antibodies and destruction of bacteria occur in lymph glands while formation of RBCs occur in bone marrow. Lymph gland is a rounded mass of lymphatic tissue that is surrounded by a capsule of connective tissue. Lymph glands filter lymph (lymphatic fluid), and they store lymphocytes (white blood cells). They are located along lymphatic vessels. They are also called a lymph node.

Question81

Which of the following is agranulocyte? (1997)

Options:

A. Basophil

B. Neutrophil

C. Lymphocyte

D. Eosinophil

Answer: C

Solution:

Solution:
(c) : Agranulocytes are leucocytes that lack granules in the cytoplasm. They are formed in spleen and lymph nodes and bone marrow. since lymphocyte does not have granules in their cytoplasm so it is called agranulocyte. Lymphocytes are important in the body's defence and are responsible for immune reactions as the presence of antigens stimulates them to produce antibodies. Another type of agranulocyte is monocyte. The other three are granulocytes which are produced in red bone marrow.

Question82

The life span of human W BC is approximately (1997)

Options:

A. between 2 to 3 months

B. more than 4 months

C. less than 10 days

D. between 20 to 30 days

Answer: C

Solution:

Solution:
(c) : WBCs (also called leucocytes) are rounded or irregular colourless cells with a nucleus. They can change their shape and are capable of amoeboid movement. Leucocytes, formed in lymph nodes and red bone marrow, can produce antibodies and move through the walls of vessels to migrate to the sites of injuries, where they surround and isolate dead tissue, foreign bodies and bacteria. They survive for a few days generally $3-4$ days after which they die and get phagocytized in blood, liver and lymph nodes.

Question83

The correct route through which pulse-making impulse travels in the heart is
(1995)

Options:

A. SA node → Purkinje fibres → bundle of His square AV node → heart muscles

B. SA node → AV node → bundle of His → Purkinje fibres → heart muscles

C. AV node → bundle of His → SA node → Purkinje fibres → heart muscles

D. AV node → SA node → Purkinje fibres → bundle of His → heart muscles

Answer: B

Solution:

Solution:
(b) The pulse making impulse travels in the heart in the order of SA node→AV node→bundle of His→Purkinje fibres→heart muscles.

Question84

The lymph serves to
(1995)

Options:

A. return the interstitial fluid to the blood

B. return the WBCs and RBCs to the lymph nodes

C. transport CO_2 to the lungs

D. transport O_2 to the brain

Answer: A

Solution:

Solution:
(a) : Lymph (also called tissue fluid in the intercellular spaces) is the colourless liquid found within the lymphatic system. An important function of lymph is to return interstitial fluid back to the blood. The interstitial fluid is the filtered form of the blood without the cellular components and plasma proteins. It consists of water containing dissolved materials. It receives CO_2, nitrogenous waste products, hormones and other synthetic substances from the tissue cells and enters the lymph capillaries to discharge them into blood.

Question85

In veins, valves are present to check backward flow of blood flowing at (1995)

Options:

A. atmospheric pressure

B. high pressure

C. low pressure

D. all of these

Answer: C

Solution:

Solution:
(c) : Veins carry blood at low pressure as compared to blood carried by arteries. Arteries carry blood from the heart whose function is to pump blood at high pressure so that blood can reach each and every part of the body. Veins carry blood from tissues to the heart, so they carry blood at low pressure. Valves are present in the veins to prevent back flow of blood due to force of gravity.

Question86

The neurogenic heart is the characteristic feature (1995)

Options:

A. humans

B. arthropods

C. rabbits

D. rats

Answer: B

Solution:

Solution:
(b) : The neurogenic heart is a characteristic feature of most arthropods and some annelids. In this, the heart beat is initiated by a nerve impulse coming from a nerve ganglion situated near the heart. The myogenic heart is a characteristic feature of molluscs and vertebrates. In this, heart beat is initiated by a patch of modified heart muscle itself. So, humans, rabbits and rats have myogenic heart.

Question87

The heart sound 'dup' is produced when (1994)

Options:

A. mitral valve is closed

B. semi-lunar valves at the base of aorta get closed

C. tricuspid valve is opened

D. mitral valve is opened

Answer: B

Solution:

Solution:
(b) : Second heart sound i.e., dup is caused by the closure of the semilunar values and marks the end of ventricular systole.

Question88

The pacesetter in the heart is called (1994)

Options:

A. sino-atrial node (SAN)

B. atrio-ventricular node (AVN)

C. Purkinje fibres

D. papillary muscle

Answer: B

Solution:

Solution:
(b) : AV (atrioventricular) node is a mass of modified heart muscle situated in the lower middle part of the right atrium. It receives the impulse to contract from the SA node via the atria and transmits it through the atrioventricular bundles to the ventricles. AV node is called the pacesetter. Here, the impulses are delayed for 0.1 second to ensure that the auricles will contract first and empty fully before the ventricles contract.

Question89

Blood capillaries are made of (1993)

Options:

A. endothelium, connective tissue and muscle fibres

B. endothelium and muscle fibres

C. endothelium and connective tissue

D. endothelium only

Answer: D

Solution:

Solution:
(d) : The wall of capillaries is very thin (usually less than one micron) and have numerous minute pores and made up of only endothelium. Exchange of material takes place between blood and tissue fluid across the endothelial membrane of capillaries through active diffusion.

Question90

Cells formed in bone marrow include (1992)

Options:

A. RBC

B. RBC and leucocytes

C. leucocytes

D. lymphocytes

Answer: B

Solution:

Solution:
(b) : In the embryo and foetal stage of vertebrates, RBCs and leucocytes are formed in the bone marrow, lymph nodes, yolk sac, liver, spleen and thymus but after birth they are formed in red bone marrow only.

Question91

The genotype of B blood group father of an O blood group child is (1992)

Options:

A. $I^{O}I^{O}$

B. $I^{B}I^{B}$

C. $I^{A}I^{B}$

D. $I^{O}I^{B}$

Answer: D

Solution:

Solution:
(d) : The genotype child of having O blood group is $I^{O}I^{O}$
If father has B blood group it is either – $I^{B}I^{B}$ or $I^{O}I^{B}$ But if father has $I^{B}I^{B}$ then child cannot have $I^{O}I^{O}$ so father must have $I^{B}I^{O}$

Question92

Component of blood responsible for producing antibodies is (1992)

Options:

A. thrombocytes

B. monocytes

C. erythrocytes

D. lymphocytes

Answer: D

Solution:

Solution:
(d) : Lymphocytes have a very large, rounded nucleus and scanty cytoplasm. They are nonmotile and nonphagocytic. They secrete antibodies to destory microbes and their toxins, reject grafts and kill tumour cells. They also help in healing of injuries. Thrombocytes aid in clotting of blood. Monocytes are phagocytic in nature. RBCs transport gases in the body.

Question93

Blood group AB has (1991)

Options:

A. no antigen

B. no antibody

C. neither antigen nor antibody

D. both antigen and antibody.

Answer: B

Solution:

Solution:
(b) : Individuals with AB blood group have both antigen A and B on their RBCs, and no antibodies for either of the antigen in their plasma. Type O individuals are without A and B antigens on their RBCs, but have antibodies for both these antigens in their plasma. Individuals with blood group AB can receive blood of A,B or O group, while those with blood group O can donate blood to anyone.

Question94

Carbonic anhydrase occurs in (1991)

Options:

A. lymphocytes

B. blood plasma

C. RBC

D. leucocytes.

Answer: C

Solution:

Solution:
(c) : During transport of CO_2 in the blood, about 70% of CO_2 released by respiring tissue cells is transported as bicarbonate ions. It diffuses into the plasma and then into the RBCs. Here, CO_2 combines with water to form carbonic acid. This reaction is catalyzed by a zinc containing enzyme carbonic anhydrase. Carbonic acid dissociates into bicarbonate and hydrogen ions. A small amount of bicarbonate ions is transported in the RBCs, whereas most of them diffuse into the plasma to be carried by it.

Question95

Wall of blood capillary is formed of (1991)

Options:

A. haemocytes

B. parietal cells

C. endothelial cells

D. oxyntic cells.

Answer: C

Solution:

Solution:
(c) : The wall of capillaries is very thin (usually less than one micron) and have numerous minute pores and made up of only endothelium. Exchange of material takes place between blood and tissue fluid across the endothelial membrane of capillaries through active diffusion.

Question96

Splenic artery arises from (1991)

Options:

A. anterior mesenteric artery

B. coeliac artery

C. posterior mesenteric artery

D. intestinal artery.

Answer: B

Solution:

Solution:
(b) : The splenic artery is the blood vessel that supplies oxygenated blood to the spleen. It branches from the coeliac artery, and follows a course superior to the pancreas. The coeliac artery is the first major branch of the abdominal aorta and branches from the aorta around the level of the T12 vertebra in humans. It is one of three anterior/ midline branches of the abdominal aorta.

Question97

A vein possesses a large lumen because (1990)

Options:

A. tunica media and tunica externa form a single coat

B. tunica interna and tunica media form a single coat

C. tunica interna, tunica media and tunica externa are thin

D. tunica media is a thin coat

Answer: D

Solution:

Solution:
(d) : Wall of a vein consists of tunic externa, tunica media and tunica interna. All these layers are also present in the wall of artery. However, in the wall of a vein, the elastic membrane of tunica interna is relatively thin, and muscle fibres and elastic fibres in tunica media are fewer. Therefore, a vein has a thinner and less elastic wall but a wider cavity than an artery of the same diameter.

Question98

Arteries carry oxygenated blood except (1989)

Options:

A. pulmonary

B. cardiac

C. hepatic

D. systemic

Answer: A

Solution:

Solution:
(a) : Pulmonary artery carries the blood from the right ventricle of the heart to the lungs for oxygenation so it carries deoxygenated blood.

Question99

Removal of calcium from freshly collected blood would
(1989)

Options:

A. cause delayed clotting

B. prevent clotting

C. cause immediate clotting

D. prevent destruction of haemoglobin

Answer: B

Solution:

Solution:
(b) : Thromboplastin, a lipoprotein, helps in clot formation. Thromboplastin helps in the formation of an enzyme prothrombinase. This enzyme inactivates heparin and it also converts the inactive plasma protein prothrombin into its active form, thrombin. Both the changes require calcium ions. Thrombin converts fibrinogen molecule to insoluble fibrin. The fibrin monomers polymerize to form long, sticky fibres. The fibrin threads form a fine network over the wound and trap blood corpuscles (RBCs, WBCs, platelets) to form a crust, the clot. Thus, if calcium is removed from the blood, clotting process will notoccur.

Question100

A person with blood group A requires blood. The blood group which can be given is
(1989)

Options:

A. A and B

B. A and AB

C. A and O

D. A, B, AB and O

Answer: C

Solution:

Solution:
A person with blood group A can receive blood from persons with blood groups A and O. A person with blood group A contains A antigen and anti- b antibody. Thus it can receive blood from a person with same blood group and also from O blood group person as O blood group person has no antigens in its body.

Question101

Tricuspid valve is found in between (1989)

Options:

A. sinus venosus and right auricle

B. right auricle and right ventricle

C. left ventricle and 1 eft auricle

D. ventricle and aorta

Answer: B

Solution:

Solution:
(b) : Tricuspid valve is the valve in the heart between the right atrium and right ventricle. It consists of three cusps that channel the flow of blood from the atrium to the ventricle. When the right ventricle contracts, forcing blood into the pulmonary artery, the tricuspid valve closes the aperture to the atrium, thereby preventing any back flow of blood. The valve reopens to allow blood to flow from the atrium into the ventricle. Thus, if tricuspid valve is partially nonfunctional the flow of blood into the pulmonary artery will be reduced.

Question102

Lymph differs from blood in possessing (1989)

Options:

A. only W BC

B. more RBC and W BC

C. more RBC and few W BC.

D. more W BC and f ew RBC

Answer: A

Solution:

(a): Lymph = Plasma + WBC
Plasma =blood − Cellular components
Serum = Plasma − Clotting factors

Question103

Presence of RBC in urine is (1988)

Options:

A. alkaptonuria

B. urothiasis

C. hematuria

D. proteinuria

Answer: C

Solution:

Solution:
(c) : Presence of RBCs in the blood is known as hematuria. Alkaptonuria is the excretion of large amount of alkapton in urine which when comes in contact with light turns black. Proteinuria is the presence of proteins in the blood.

Question104

Child death may occur in the marriage of (1988)

Options:

A. Rh^+ man and Rh^+ woman

B. Rh^+ man and Rh^- woman

C. Rh^- man and Rh^- woman

D. Rh^- man and Rh^+ woman

Answer: B

Solution:

(b) : Rh factor plays a crucial role in child's birth born out of a marriage between Rh^- woman and a Rh^+ man. In such a case, the mother becomes sensitive while carrying a first Rh^+ child within her womb. The reason for such sensitivity is that some of the RBCs from the developing embryo get into the blood stream of the mother during development, causing her to produce anti-Rh antibodies. In fact, the first child of such parents is nearly normal and is delivered safely. However, if such a mother gets pregnant again, the subsequent Rh^+ foetuses will be exposed to the antiRh antibodies produced by the mother. As a result serious damage to the red blood cells of the developing embryo will occur causing haemolytic disease of the newborn (HDN) or erythroblastosis foetalis. This disease leads to the death of the developing embryo before birth or after parturition.

Question105

Breakdown product of hemoglobin is (1988)

Options:

A. bilirubin

B. iron

C. biliverdin

D. calcium

Answer: B

Solution:

(a, b): The haemoglobin is broken down into haem i.e., iron and globin protein which is then converted into yellowish substance bilirubin which is extracted by the liver cells from the blood and stored in the form of bile in gall bladder.

Question106

RBCs do not occur in (1988)

Options:

A. frog

B. cow

C. camel

D. cockroach

Answer: D

Solution:

(d) : RBCs do not occur in the blood of cockroach. The circulatory system of cockroach is of open type. Viscera lie in the haemocoel immersed in blood called haemolymph. The latter consists of colourless plasma and irregular white corpuscles, the leucocytes. There are no blood vessels except aorta that carries blood from the heart to the haemocoel.
