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| Division | 11th |
| Subject | Biology |
| Chapter | Body Fluids and Circulation |
| Author | Anand |
| Category | 1 |

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| Given below are two statements:  Statement I: The coagulum is formed of network of threads called thrombin’s.  Statement II: Spleen is the graveyard of erythrocytes.  In the light of the above statements, choose the most appropriate answer from the options given below:  2022 |
| Both statement I and Statement II are correct |
| Both Statement I and Statement II are incorrect |
| Statement I is correct but Statement II is incorrect |
| Statement I is incorrect but Statement II is correct |
| d |
| Blood platelets or thrombocytes are blood cells that participate in blood clotting |
| Clot or coagulum is formed mainly of network of threads called fibrins in which dead and damaged formed elements of blood are trapped. |
| Thrombocyte |

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| Persons with 'AB' blood group are called as "Universal recipients". This is due to |
| absence of antibodies, anti- and anti-B, in plasma |
| absence of antigens A and B on the surface of |
| absence of antigens A and B in plasma |
| presence of antibodies, anti-A and anti-B, on RBCs. |
| a |
| Persons with the AB blood group have the genotype IAIB. |
| AB blood group has A and B antigens on RBCs and no antibodies in plasma. So, these persons can accept blood from person with as well as the other groups of blood. Therefore, such persons are called universal recipients. |
| ABO grouping |

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| Which enzyme is responsible for the conversion of inactive fibrinogens to fibrins?2021 |
| Thrombokinase |
| Thrombin |
| Renin |
| Epinephrine |
| b |
| Fibrin makes a mesh-like structure around the platelet |
| Fibrins are formed by the conversion of inactive fibrinogen in the plasma by the enzyme thrombin and thrombin’s are formed from another inactive substance present in plasma i.e., prothrombin. |
| Thrombocyte |

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| 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.  (2017) |
| Only (1) |
| (1), (3) and (4) |
| (2) and (3) |
| Only (4) |
| d |
| Adult human RBCs or erythrocytes are enucleate |
| Red blood cells of adult humans do not have cell organelles including nucleus, Golgi bodies, mitochondria, ribosomes, etc. It increases the surface area of and enables them to contain more haemoglobin (the oxygen carrying pigment |
| Erythrocytes |

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| Name the blood cells, whose reduction in number can cause clotting disorder, leading to excessive loss of blood from the body. |
| Erythrocytes |
| Leucocytes |
| Neutrophils |
| Thrombocytes |
| d |
| Can lead to clotting disorders |
| 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 , 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. |
| Thrombocytes |

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| Serum differs from blood in  NEET-II 2016 |
| lacking globulins |
| lacking albumins |
| lacking clotting factors |
| lacking antibodies. |
| c |
| Plasma and serum |
| 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. |
| Composition of blood |

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| Erythropoiesis starts in  2015 Cancelled |
| Spleen |
| red bone marrow |
| Kidney |
| liver |
| b |
| Site of RBC’s |
| The correct answer is Erythropoiesis is the formation of red blood cells (erythrocytes) which occurs in the red bone marrow. |
| Erythrocytes |

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| The figure shows a human blood cell. Identify it and give its characteristics.    Karnataka NEET 2013 |
| Basophil -Secretes serotonin, inflammatory response |
| B-lymphocyte- Forms about of blood cells involved in immune response |
| Neutrophil- Most abundant blood cells, phagocytic |
| Monocyte- Lifespan of 3 days, produces antibodies |
| a |
| Types of blood cell and its characteristics |
| 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. |
| Leucocytes |

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| 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 |
| Blood group B |
| Blood group |
| Blood group |
| Blood group A |
| c |
| Possess both anti-A and anti-B |
| The blood group was . The person having blood group is universal donor. It lacks both antigens ' ' and ' ' thus does not cause agglutination or clumping of blood cells when transfused into person with any of the four blood groups. |
| ABO Grouping |

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| Which one of the following human organs is often called the "graveyard" of RBCs?  Mains 2012 |
| Gall bladder |
| Kidney |
| Spleen |
| Liver |
| C |
| Reservoir for RBC’s |
| The correct answer is 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 s 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. |
| Erythrocytes |

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| Which one of the following plasma proteins is involved in the coagulation of blood?  2011 |
| Albumin |
| Serum amylase |
| Globulin |
| Fibrinogen |
| d |
| Fiber like structures |
| 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 an important role in blood clotting. |
| Coagulation of blood |

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| A person with unknown blood group under 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 |
| Type B |
| Type |
| Type |
| Type A |
| c |
| Universal donor |
| The blood group was . The person having blood group is universal donor. It lacks both antigens ' ' and ' ' thus does not cause agglutination or clumping of blood cells when transfused into person with any of the four blood groups. |
| ABO grouping |

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| Which two of the following changes (i -iv) usually tend to occur in the plain dwellers when they move to high altitudes (3,500 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 |
| (ii) and (iii) |
| (iii) and (iv) |
| (i) and (iv) |
| (i) and (ii). |
| a |
| Increased level of RBC’s |
| 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 include 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. |
| Human circulatory system |

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| The haemoglobin content per of blood of a normal healthy human adult is  Mains 2010 |
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|  |
| d |
| Per 100 ml of blood |
| The correct option is 12 - 16 g ; Haemoglobin is the iron containing protein found in red blood cells. It delivers oxygen from lungs to other tissues of the body. A normal healthy individual has 12 - 16 g of haemoglobin per 100 ml of blood. Haemoglobin content lower than this level can cause anemia. |
| Composition of blood |

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| There is no DNA in |
| mature RBCs |
| a mature spermatozoan |
| hair root |
| an enucleated ovum |
| a |
| Erythrocytes have only mitochondria |
| The correct option is Mature RBCs; Mature human RBCs extrude mitochondria as well as nucleus during maturation. Thus they don’t have both mitochondrial and genomic DNA. An enucleated ovum contains DNA in the mitochondria. Hair root or hair follicle is the living part of the hair that produces the shaft, follicle contains a group of cells that are nucleated. A mature spermatozoan contains DNA in the head region. |
| Erythrocytes |

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| Globulins contained in human blood plasma are primarily involved in  2009 |
| osmotic balance of body fluids |
| oxygen transport in the blood |
| clotting of blood |
| defence mechanisms of body. |
| d |
| Antibodies |
| 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. |
| Thrombocyte |

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| The most popularly known blood grouping is the grouping. It is named and not , because " " in it refers to having  2009 |
| overdominance of this type on the genes for and types |
| one antibody only - either anti - A or anti - B on the RBCs |
| no antigens A and B on RBCs |
| other antigens besides A and B on RBCs. |
| c |
| Not contains anti-A and Anti-b Antibodies |
| In blood group, refers to blood group. It has no antigen and on . 21. (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. |
| ABO Grouping |

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| The most active phagocytic white blood cells are  2008 |
| eosinophils and lymphocytes |
| neutrophils and monocytes |
| neutrophils and eosinophils |
| lymphocytes and macrophages. |
| b |
| Phagocytic cells |
| The correct option is Neutrophils and Monocytes; Phagocytic cells are those that are capable of engulfing other harmful cells or foreign organisms. Out of the WBCs, there are only three that are phagocytic namely neutrophils, monocytes, and eosinophils. Eosinophil cells fight allergic and parasitic infections. Out of these three, neutrophils and monocytes are the most active phagocytic cells These white blood cells are capable of reacting to an infection site and phagocytizing the invasive bacteria. |
| Leucocytes |

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| Which type of white blood cells are concerned with the release of histamine and the natural anticoagulant heparin?  2008 |
| Eosinophils |
| Monocytes |
| Neutrophils |
| Basophils |
| d |
| Function of basophils is similar to that of mast cells. |
| 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. |
| Leucocytes |

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| A drop of each of the following, is placed separately on four slides. Which of them will not coagulate? |
| Blood serum |
| Sample from the thoracic duct of lymphatic system |
| Whole blood from pulmonary vein |
| Blood plasma |
| a |
| Clotting factors |
| The correct answer is 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 non-human mammal (e.g., a horse). |
| Mechanism of coagulation |

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| 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 provided with the following four types of test tubes. Which of these you will not use for the purpose? |
| Test tube containing calcium bicarbonate |
| Chilled test tube |
| Test tube containing heparin |
| Test tube containing sodium oxalate |
| a |
| Clotting agents |
| The correct option is Test tube containing Calcium Chloride; Clotting of blood can be prevented by adding heparin, one of the most powerful anticoagulants, which acts indirectly by activating plasma antithrombin III. Heparin is effective both in vivo and in vitro. EDTA and sodium citrate are also effective anticoagulants. Calcium on the other hand, is required for the clotting cascade of blood. Without calcium, blood cannot clot. So, use of a calcium compound will most definitely induce clotting. |
| Mechanism of coagulation |

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| In the system of blood groups, if both antigens are present but no antibody, the blood group of the individual would be |
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|  |
| c |
| Universal recipient |
| Individuals with AB blood group have both antigen and on their RBCs, and no antibodies for either of the antigen in their plasma. Type individuals are without and antigens on their RBCs, but have antibodies for both these antigens in their plasma. Individuals with blood group can receive blood of or group, while those with blood group can donate blood to anyone. |
| ABO grouping |

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| What is correct for blood group ?  2001 |
| No antigens but both a and b antibodies are present. |
| A antigen and antibody present. |
| Antigen and antibody both absent. |
| and antigens and antibodies present. |
| a |
| Universal donor |
| Individuals with AB blood group have both antigen and on their RBCs, and no antibodies for either of the antigen in their plasma. Type individuals are without and antigens on their RBCs, but have antibodies for both these antigens in their plasma. Individuals with blood group can receive blood of or group, while those with blood group can donate blood to anyone. |
| ABO Grouping |

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| Erythroblastosis fetalis is caused when fertilisation takes place between gametes of |
| female and male |
| female and male |
| female and male |
| female and male. |
| a |
| Erythroblastosis fetalis is caused when a mother having Rh-blood group conceives a child having Rh+child. |
| If fertilisation takes place between gametes of female and male then the resulting fetus' blood is 'The blood of the fetus stimulates the formation of anti factors in the mother's blood. In second pregnancy (with fetus), the anti factors of the mother's blood destroy the fetal red blood corpuscles. This is called erythroblastosis fetalis. New born may survive but it is often anaemic. The child does not suffer. |
| Rh Grouping |

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| Which statement is true for WBC? |
| Non-nucleated |
| In deficiency, cancer is caused |
| Manufactured in thymus |
| Can squeeze through blood capillaries |
| d |
| Antibodies |
| 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 leukemia, a cancer. WBCs are of two types, granulocytes (formed in bone marrow) and agranulocytes (formed in bone marrow and thymus). |
| Leucocytes |

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| Which is the principal cation in the plasma of the blood?  1999 |
| Potassium |
| Magnesium |
| Calcium |
| Sodium |
| D |
| 90% Water and 10 % others |
| Blood consists of a watery fluid called plasma. Plasma is a faint yellow, slightly alkaline, viscous fluid. It consists of water, inorganic salts, or proteins and 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. |
| Composition of blood |

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| The problem, due to factor arises when the blood of two and mix up  1999 |
| during pregnancy |
| in a test tube |
| through transfusion |
| both pregnancy and through transfusion |
| d |
| Rh positive and negative |
| The correct answer is A protein named as Rhesus antigen, is present on the surface of red blood corpuscles. Persons having this Rhesus antigen (Rh factor) are called positive . Others who do not have this factor are known as negative . Both and individuals are phenotypically normal. The problem arises during blood transfusion and pregnancy. |
| Rh Grouping |

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| Which of the following is agranulocyte?  1997 |
| Basophil |
| Neutrophil |
| Lymphocyte |
| Eosinophil |
| c |
| White blood cells |
| 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. |
| Leucocytes |

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| The life span of human WBC is approximately |
| between 2 to 3 months |
| more than 4 months |
| less than 10 days |
| between 20 to 30 days. |
| c |
| Antibodies |
| 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 phagocytised in blood, liver and lymph nodes. |
| Leucocytes |

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| Vitamin is required for |
| change of prothrombin into thrombin |
| synthesis of prothrombin |
| change of fibrinogen to fibrin |
| formation of thromboplastin. |
| b |
| Coagulating factors |
| Vitamin is essential for blood clotting as it is necessary for the synthesis of prothrombin in the liver. |
| Mechanism of coagulation |

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| Cells formed in bone marrow include  1992 |
|  |
| RBCs and leucocytes |
| Leucocytes |
| Lymphocytes |
| b |
| Antibodies |
| 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. |
| Leucocytes |

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| Component of blood responsible for producing antibodies is  1992 |
| Thrombocytes |
| Monocytes |
| Erythrocytes |
| Lymphocytes |
| d |
| Antibodies sites |
| 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 and erythrocytes (RBCs) transport gases in the body. |
| Leucocytes |

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| Blood group has |
| no antigen |
| no antibody |
| neither antigen nor antibody |
| both antigen and antibody |
| b |
| Universal donor |
| Individuals with AB blood group have both antigen and on their RBCs, and no antibodies for either of the antigen in their plasma. Type individuals are without and antigens on their RBCs, but have antibodies for both these antigens in their plasma. Individuals with blood group can receive blood of or group, while those with blood group can donate blood to anyone. |
| ABO grouping |

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| Carbonic anhydrase occurs in  1991 |
| Lymphocytes |
| blood plasma |
| RBCs |
| leucocytes |
| c |
| Carbonic acid dissociates into bicarbonate and hydrogen ions. |
| During transport of in the blood, about of released by respiring tissue cells is transported as bicarbonate ions. It diffuses into the plasma and then into the RBCs. Here, 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. |
| Erythrocytes |

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| Removal of calcium from freshly collected blood would |
| cause delayed clotting |
| prevent clotting |
| cause immediate clotting |
| prevent destruction of hemoglobin |
| b |
| Clotting factors |
| 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 polymerise 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 not occur. |
| Mechanism of coagulation |

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| A person with blood group A requires blood. The blood group which can be given is  1989 |
| A and |
| and |
| and |
| A, B, AB and O |
| c |
| Universal Donor |
| Individuals with AB blood group have both antigen and on their RBCs, and no antibodies for either of the antigen in their plasma. Type individuals are without and antigens on their RBCs, but have antibodies for both these antigens in their plasma. Individuals with blood group can receive blood of or group, while those with blood group can donate blood to anyone. |
| ABO Grouping |

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| Which one engulfs pathogens rapidly?  1989 |
| Acidophils |
| Monocytes |
| Basophils |
| Neutrophils |
| d |
| Granulocytes |
| Neutrophils, are the most abundant type of white blood cells and form an integral part of the immune system. These phagocytes are normally found in the blood stream. However, during the acute phase of inflammation, particularly as a result of bacterial infection, neutrophils leave the vasculature and migrate toward the site of inflammation in a process called chemotaxis. They are the predominant cells in pus, accounting for its whitish/yellowish appearance. Neutrophils react within an hour of tissue injury and are the hallmark of acute inflammation. Monocytes are also phagocytes but take 7-8 hours to reach at the site of injury. Acidophils and basophils are not phagocytic in nature. |
| Leukocytes |

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| Child death may occur in the marriage of |
| man and woman |
| man and woman |
| man and woman |
| man and woman. |
| b |
| Different Rh Typing |
| Rh factor plays a crucial role in child's birth born out of a marriage between woman and a man. In such a case, the mother becomes sensitive while carrying a first 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 foetuses will be exposed to the anti-Rh 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 fetalis. This disease leads to the death of the developing embryo before birth or after parturition. |
| Rh Typing |

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| Breakdown product of hemoglobin is |
| Bilirubin |
| Iron |
| Biliverdin |
| Calcium |
| a,b |
| Made up of iron |
| The hemoglobin is broken down into haeme 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. |
| Composition of blood |

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| RBCs do not occur in  1988 |
| Frog |
| Cow |
| Camel |
| cockroach |
| d |
| Open circulatory pathway |
| 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. |
| Erythrocytes |

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| Which one of the following is correct?  2015 Cancelled |
| Lymph Plasma + RBC + WBC |
| Blood = Plasma Platelets |
| Plasma Blood – Lymphocytes |
| Serum = Blood + Fibrinogen |
| b |
| Composition |
| The correct answer is Blood= Plasma +RBC+WBC+ Platelets; Lymph Plasma + WBC Plasma Blood - Cellular components Serum Plasma - Clotting factors |
| Composition of blood |

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| Compared to blood our lymph has  2009 |
| plasma without proteins |
| more WBCs and no RBCs |
| more RBCs and less WBCs |
| no plasma |
| b |
| Antibodies |
| The correct option is more WBCs and no RBCs; Lymph is a mobile connective tissue comprising lymph plasma and lymph corpuscles. Its composition is just like plasma except that it lacks RBCs and large plasma proteins. |
| Lymph: Functions |

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| Which of the following is not the main function of lymph glands?  1988 |
| Forming RBCs |
| Destroying bacteria |
| Forming WBCs |
| Forming antibodies |
| a |
| Mainly in antibodies |
| 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 lymph node. |
| Lymph: Functions |

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| The lymph serves to |
| return the interstitial fluid to the blood |
| return the WBCs and RBCs to the lymph nodes |
| transport to the lungs |
| transport to the brain. |
| a |
| Tissue fluid in intracellular spaces |
| 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 , nitrogenous waste products, hormones and other synthetic substances from the tissue cells and enters the lymph capillaries to discharge them into blood. |
| Lymph: Functions |

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| Lymph differs from blood in possessing |
| only WBC |
| more RBC and WBC |
| more and few |
| more WBC and few RBC. |
| a |
| Antibodies |
| The correct option is only WBC.Lymph is a colourless, mobile, fluid connective tissue. It consists of two parts: a fluid matrix, the plasma, in which float amoeboid cells, the white blood cells. The lymph differs from the blood in lacking red blood cells, platelets and some plasma proteins. |
| Lymph |

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| Which one of the following statements is correct? |
| The atrio-ventricular node (AVN) generates an action potential to stimulate atrial contraction |
| The tricuspid and the bicuspid valves open due to the pressure exerted by the simultaneous contraction of the atria |
| Blood moves freely from atrium to the ventricle during joint diastole. |
| Increased ventricular pressure causes closing of the semilunar valves. |
| c |
| Valve functions |
| During joint diastole stage AV valves open and passive filling of ventricle occurs. The tricuspid and the bicuspid valves open due to the fall in the ventricular pressure during the joint diastole itself (not during atrial systole). Increased ventricular pressure causes closing of the atrioventricular (bicuspid and tricuspid) valves. Atrial contraction is stimulated by the action potentials generated by the SA node. |
| Heart: Valves |

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| The QRS complex in a standard ECG represents |
| repolarisation of auricles |
| depolarisation of auricles |
| depolarisation of ventricles |
| repolarisation of ventricles. |
| c |
| ECG cycle |
| The QRS complex represents the depolarisation of the ventricles, that initiates the ventricular contraction. |
| Cardiac cycle |

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| What would be the heart rate of a person if the cardiac output is , blood volume in the ventricles  at the end of diastole is and at the end of ventricular systole is ?  2019 |
| 125 beats per minute |
| 50 beats per minute= |
| 50 beats per minute |
| 100 beats per minute |
| d |
| Heart beat Stroke volume |
| End systolic volume  Cardiac output Heart beat Stroke volume  Heart beat Cardiac output Stroke volume  beats per minut |
| Cardiac cycle: Stroke volume |

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| Doctors use stethoscope to hear the sounds produced during each cardiac cycle. The second sound is heard when  2015 |
| AV node receives signal from SA node |
| AV valves open up |
| Ventricular walls vibrate due to gushing in of blood from atria |
| Semilunar valves close down after the blood flows into vessels from ventricles. |
| d |
| Close of ventricular valve |
| Second heart sound i.e., dup is caused by the closure of the semilunar valves and marks the end of ventricular systole. |
| Heart: Valves |

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| Blood pressure in the mammalian aorta is maximum during  2015 Cancelled |
| systole of the left ventricle |
| diastole of the right atrium |
| systole of the left atrium |
| diastole of the right ventricle |
| a |
| By valve close and open |
| 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 . 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. |
| Heart: Aorta |

|  |
| --- |
| The diagram given here is the standard ECG of a normal person. The P-wave represents the    2013 |
| beginning of the systole |
| end of systole |
| contraction of both the atria |
| initiation of the ventricular contraction. |
| c |
| Atria excitation |
| 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 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. |
| Cardiac cycle: Sequential events in cardiac cycle |

|  |
| --- |
| 'Bundle of His' is a part of which one of the following organs in humans?  2011 |
| Brain |
| Heart |
| Kidney |
| Pancreas |
| b |
| Av and AVN nodes |
| '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. |
| Heart: Nodal system |

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| --- |
| Given below is the ECG of a normal human. Which one of its components is correctly interpreted below?    Mains 2011 |
| Complex QRS - one complete pulse |
| Peak T - initiation of total cardiac contraction |
| Peak and peak R together - systolic and diastolic blood pressures |
| Peak P-initiation of left atrial contraction only |
| a |
| Excitation and repolarization |
| 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. |
| Sequential events in cardiac cycle |

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| If due to some injury the chordae tendinae of the tricuspid valve of the human heart is partially nonfunctional, what will be the immediate effect?  2010 |
| The flow of blood into the aorta will be slowed down. |
| The 'pacemaker' will stop working. |
| The blood will tend to flow back into the left atrium. |
| The flow of blood into the pulmonary artery will be reduced. |
| d |
| Tricuspid valves |
| 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 backflow of blood. The valve reopens to allow blood to flow from the atrium into the ventricle. Thus, if tricuspid valve is partially non-functional the flow of blood into the pulmonary artery will be reduced. |
| Heart: Valves |

|  |
| --- |
| In a standard ECG which one of the following alphabets is the correct representation of the respective activity of the human heart? |
| S - start of systole |
| - end of diastole |
| P - depolarisation of the atria |
| - repolarisation of ventricles |
| c |
| Excitation and repolarization |
| 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. |
| Sequential events in cardiac cycle |

|  |
| --- |
| In humans, blood passes from the post caval to the diastolic right atrium of heart due to |
| stimulation of the sino auricular node |
| pressure difference between the post caval and atrium |
| pushing open of the venous valves |
| suction pull |
| b |
| pressure difference between the post caval and atrium |
| 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. |
| Human circulatory system |

|  |
| --- |
| Which one of the following has an open circulatory system? |
| Octopus |
| Pheretima |
| Periplaneta |
| Hirudinaria |
| c |
| Cockroach |
| The correct answer is 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. |
| Human circulatory system |

|  |
| --- |
| 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 |
| atrioventricular bundle |
| Purkinje system |
| sinoatrial node |
| atrioventricular node. |
| c |
| Right ventricle |
| The artificial pacemaker is a small battery-operated electrical stimulator planted beneath the skin under right clavicle while the string / cable is passed via superior vena cava, right atrium and allowed to rest against the tip of the right ventricle. It is an electrical device used for covering up any deficiency of myogenic functioning so as to make heart beat normally. |
| Heart:Valves |

|  |
| --- |
| Bundle of His is a network of  2003 |
| muscle fibres distributed throughout the heart walls |
| muscle fibres found only in the ventricle wall |
| nerve fibres distributed in ventricles |
| nerve fibres found throughout the heart |
| b |
| Heart fibers |
| 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. |
| Structure of heart |

|  |
| --- |
| Systemic heart refers to |
| the heart that contracts under stimulation from nervous system |
| left auricle and left ventricle in higher vertebrates |
| entire heart in lower vertebrates |
| the two ventricles together in humans. |
| b |
| The Heart is a muscular organ about the size of a fist. |
| Systemic heart refers to the left auricle and left ventricle in higher vertebrates. The left side of the heart which is involved in the systemic circulation known as systemic heart. |
| Human circulatory system |

|  |
| --- |
| Impulse of heart beat originates from |
| SA node |
| AV node |
| vagus nerve |
| cardiac nerve |
| a |
| Node consists of a cluster of cells |
| 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. |
| Heart: Valves |

|  |
| --- |
| Rate of heart beat is determined by |
| Purkinje fibres |
| papillary muscles |
| AV node. |
| SA node. |
| d |
| Specialized bundle of neurons located in the upper part of the right atrium |
| SA node is a specialized 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 this 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 heartbeat. |
| Human circulatory system |

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| --- |
| The correct route through which pulse-making impulse travels in the heart is |
| SA node Purkinje fibres bundle of His AV node heart muscles |
| SA node AV node bundle of His Purkinje fibres heart muscles |
| AV node bundle of His SA node Purkinje fibres heart muscles |
| AV node SA node Purkinje fibres bundle of His heart muscles. |
| b |
| Cardiac cycle |
| The correct option is SA node → AV node → bundle of His →Purkinje fibres → heart muscles; The initiation of heartbeat or the cardiac cycle begins when the deoxygenated blood enters the right atrium which stimulates the SAN to undergo depolarisation. The electrical signal travels from the SA node through muscle cells in the right and left atria. The signal triggers the muscle cells that make your atria contract. The atria contract, pumping blood into your left and right ventricles. After electrical impulse is sent from the sinoatrial (SA) node to the atrioventricular (AV) node, the bundle of His quickly transmits the impulse to the left and right bundle branches and into the ventricles through Purkinje fibres, resulting in a synchronised contraction of the ventricles. |
| Sequential events in cardiac cycle |

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| --- |
| The neurogenic heart is the characteristic feature of |
| Humans |
| Arthropods |
| Rabbits |
| rats |
| b |
| Lower vertebrates |
| 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. |
| Regulation of cardiac activity |

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| The heart sound 'dup' is produced when |
| mitral valve is closed |
| semi-lunar valves at the base of aorta get closed |
| tricuspid valve is opened |
| mitral valve is opened |
| b |
| Valves at the base of aorta |
| The correct option is semi-lunar valves at the base of aorta get closed; The “dup” sound is produced by the closure of the semilunar valves at the start of ventricular relaxation. It lasts for 0.1 seconds and its principle frequency is 50 cycles/sec. It is higher pitched, louder, sharper and of short duration as compared to ‘lub’. The semilunar valves close to prevent any backflow of blood from aorta to the ventricles |
| Cardiac cycle: Heart sounds |

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| The pacesetter in the heart is called |
| sino-atrial node (SAN) |
| atrio-ventricular node (AVN) |
| Purkinje fibres |
| papillary muscle. |
| b |
| Atrioventricular bundles to the ventricles |
| The correct answer is 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. |
| Heart: Valves |

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| --- |
| Tricuspid valve is found in between |
| sinus venosus and right auricle |
| right auricle and right ventricle |
| left ventricle and left auricle |
| ventricle and aorta |
| b |
| The valves are present between the upper and lower chambers on both sides of the mammalian heart |
| Human heart is four-chambered. Two chambers are found on the right side of the heart while two are present on the left. The two upper chambers on respective sides are called atria while the lower chambers are called ventricles. The blood flows in one way from each chamber of the heart. The tricuspid valve is present on the right side of the mammalian heart. Its primary function is to prevent the backflow of blood from the right ventricle into the right auricle. The blood enters into the heart through two veins, known as the inferior vena cava and the superior vena cava, into the right atrium of the heart. Then the atrium contracts and blood flows from the right atrium into the right ventricle through the tricuspid valve. The tricuspid valve prevents the backflow of blood and shuts down when the ventricle is full. The blood further flows into the Pulmonary artery and is then transferred to the lungs for oxygenation. |
| Heart: Valves |

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| --- |
| The hepatic portal vein drains blood to liver from |
| Stomach |
| Kidneys |
| Intestine |
| heart |
| c |
| Hepatic portal vein carries the blood from the intestine which contains the nutrients absorbed from the digestive tract and it is transferred to the liver. |
| 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. |
| Double circulation |

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| Blood pressure in the pulmonary artery is  NEET-I 2016 |
| more than that in the pulmonary vein |
| less than that in the venae cavae |
| same as that in the aorta |
| more than that in the carotid. |
| a |
| Blood capillaries |
| The correct option is More than that in the pulmonary vein; Blood pressure in different blood vessels: Artery > arteriole > capillary > venule> vein (Vena cava). |
| Blood vessels |

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| In mammals, which blood vessel would normally carry largest amount of urea?  NEET-I 2016 |
| Hepatic vein |
| Hepatic portal vein |
| Renal vein |
| Dorsal aorta |
| a |
| Ornithine cycle takes place in liver |
| Hepatic vein carries largest amount of urea. Urea is produced in liver. Hepatic vein transports liver's deoxygenated blood to heart for oxygenation |
| Blood vessels: Veins |

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| --- |
| Which one of the following animals has two separate circulatory pathways?  2015 |
| Whale |
| Shark |
| Frog |
| Lizard |
| a |
| Blood flows twice through the heart. |
| 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. |
| Double circulation |

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| The given figure shows schematic plan of blood circulation in humans with labels A to D. Identify the label and give its functions.    2013 |
| C - Vena cava - Takes blood from body parts to right auricle, |
| D - Dorsal aorta - Takes blood from heart to body parts, |
| A - Pulmonary vein - Takes impure blood from body parts, |
| B - Pulmonary artery - Takes blood from heart to lungs, |
| a |
| Blood vessels |
| The correct answer is in the given figure, is pulmonary vein which brings pure blood from lungs to left atrium, B is dorsal aorta which carries blood from heart to body parts, is vena cava which carries impure blood from body parts to right auricle and is pulmonary artery which takes impure blood from heart to lungs. |
| Blood vessels:Arteries and veins |

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| Arteries are best defined as the vessels which  2011 |
| supply oxygenated blood to the different organs |
| carry blood away from the heart to different organs |
| break up into capillaries which reunite to form a vein |
| carry blood from one visceral organ to another visceral organ. |
| b |
| They are mainly involved in blood circulation throughout the body |
| 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. |
| Blood vessels: Arteries |

|  |
| --- |
| Fastest distribution of some injectable material/ medicine and with no risk of any kind can be achieved by injecting it into the  Mains 2010 |
| Muscles |
| Arteries |
| Veins |
| lymph vessels |
| c |
| The fastest mode of injection is intravenous. |
| Intravenous injection is given for rapid distribution of drugs/substance. Intra-muscular injection is given for producing local effect. |
| Blood vessels: Veins |

|  |
| --- |
| Difference between pulmonary artery and pulmonary vein is that, the pulmonary artery has |
| no endothelium |
| Valves |
| thicker walls |
| oxygenated blood |
| c |
| Walls of the capillaries |
| 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. |
| Blood vessels: Capillaries |

|  |
| --- |
| In which point, pulmonary artery is different from pulmonary vein? |
| Its lumen is broad. |
| Its wall is thick. |
| It has valves. |
| It does not possess endothelium. |
| b |
| Walls of the capillaries |
| 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. |
| Blood vessels: Capillaries |

|  |
| --- |
| Which vertebrate organ receives only oxygenated blood? |
| Spleen |
| Liver |
| Gill |
| Lung |
| a |
| Transport o blood |
| The correct answer is Spleen receives only oxygenated blood from the heart through splenic artery. The liver receives a blood supply from two sources. The first is the hepatic artery which delivers oxygenated blood from the general circulation. The second is the hepatic portal vein delivering deoxygenated blood from the small intestine containing nutrients. The blood flows through the liver tissue to the hepatic cells where many metabolic functions take place. The blood drains out of the liver via the hepatic vein. Gill and lung receive deoxygenated blood as these are the organs where oxygenation of blood takes place. |
| Blood vessels |

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| In veins, valves are present to check backward flow of blood flowing at |
| atmospheric pressure |
| high pressure |
| low pressure |
| all of these. |
| c |
| Veins carry blood at slower rate |
| 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 backflow of blood due to force of gravity. |
| Blood vessels: Capillaries |

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| --- |
| Blood capillaries are made of |
| endothelium, connective tissue and muscle fibres |
| endothelium and muscle fibres |
| endothelium and connective tissue |
| endothelium only. |
| d |
| Blood capillaries are membrane |
| 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. |
| Blood capillaries |

|  |
| --- |
| Wall of blood capillary is formed of |
| Haemocytes |
| parietal cells |
| endothelial cells |
| oxyntic cells. |
| d |
| Capillaries are the thinnest among the blood vessels. |
| Wall of a vein consists of tunica 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. |
| Blood vessels:Capillaries |

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| --- |
| Splenic artery arises from |
| anterior mesenteric artery |
| coeliac artery |
| posterior mesenteric artery |
| intestinal artery |
| b |
| Oxygenated blood to the spleen |
| 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. |
| Blood vessels: Veins |

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| --- |
| A vein possesses a large lumen because |
| tunica media and tunica externa form a single coat |
| tunica interna and tunica media form a single coat |
| tunica interna, tunica media and tunica externa are thin |
| tunica media is a thin coat. |
| a |
| Comparatively thin in the veins making a large lumen in veins |
| The tunica media is comparatively thin in the veins making a large lumen in veins. Basically each artery and vein consists of three layers, an inner lining of squamous endothelium, the tunica interna, a middle layer of smooth muscle and elastic fibre, the tunica media and an external layer of fibrous connective tissue with collagen fibres, the tunica externa. |
| Blood vessels: Veins |

|  |
| --- |
| Arteries carry oxygenated blood except |
| Pulmonary |
| Cardiac |
| Hepatic |
| Systemic. |
| a |
| Right ventricle |
| Pulmonary artery carries the blood from the right ventricle of the heart to the lungs for oxygenation so it carries deoxygenated blood. |
| Blood vessels:Arteries |

|  |
| --- |
| How do parasympathetic neural signals affect the working of the heart?  2014 |
| Reduce both heart rate and cardiac output. |
| Heart rate is increased without affecting the cardiac output. |
| Both heart rate and cardiac output increase. |
| Heart rate decreases but cardiac output increases. |
| a |
| Can increase the rate of heartbeat |
| The correct option is Reduce both heart rate and cardiac output; A special neural centre in medulla oblongata can moderate the cardiac function through the autonomic nervous system (ANS). Neural signals from the sympathetic nerves (part of ANS) can increase the rate of heartbeat, the strength of ventricular contraction and thereby the cardiac output. Parasympathetic neural signals ( a component of ANS) decrease the rate of heart beat, the speed of conduction of action potential and thereby the cardiac output. |
| Regulation of circulatory system |

|  |
| --- |
| Which one of the following statements is correct regarding blood pressure?  2011 |
| is considered high and requires treatment. |
| is considered an ideal blood pressure. |
| makes one very active. |
| Hg may harm vital organs like brain and kidney. |
| d |
| Blood pressure |
| If repeated checks of blood pressure of an individual is 140/90" " mmHg or higher, it shows hypertension or high blood pressure. It leads to heart diseases and also affects vital organs like brain and kidney. |
| Human circulatory system |

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| --- |
| The thickening of walls of arteries is called 1999 |
| Arteriosclerosis |
| Arthritis |
| Aneurysm |
| both arthritis and aneurysm |
| a |
| Hardening of blood vessels |
| 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. |
| Disorders of circulatory system |

|  |
| --- |
| An adult human with average health has systolic and diastolic pressures as |
| and |
| and |
| and |
| and . |
| a |
| Systolic and diastolic pressure |
| 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 . 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. |
| Hypertension |