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| Division | 11th |
| Subject | Biology |
| Chapter | Breathing and Exchange of Gases |
| Author | Anand |
| Category | 1 |

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| Which of the following is not the function of conducting part of respiratory system?  2013 |
| It clears inhaled air from foreign particles |
| Inhaled air is humidified |
| Temperature of inhaled air is brought to body temperature |
| Provides surface for diffusion of and |
| d |
| Helps in diffusion |
| Exchange or respiratory part of respiratory system is the site of actual diffusion of and between blood and atmospheric air. |
| Respiration |

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| The figure shows a diagrammatic view of human respiratory system with labels and . Select the option which gives correct identification and main function and / or characteristic.    2013 |
| C - Alveoli - Thin walled vascular bag like structures for exchange of gases. |
| D - Lower end of lungs - Diaphragm pulls it down during inspiration. |
| A - Trachea - Long tube supported by complete cartilaginous rings for conducting inspired air. |
| B - Pleural membrane - Surround ribs on both sides to provide cushion against rubbing. |
| a |
| Gas exchange |
| In the given figure, is trachea. It is supported by incomplete cartilaginous rings which prevent its collapse during inspiration. is pleural membrane and it encloses lungs. is alveoli that are thin walled sacs having extensive network of capillaries for gaseous exchange. is diaphragm. |
| Respiratory organs |

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| Lungs are enclosed in  1990 |
| Periosteum |
| Perichondrium |
| Pericardium |
| pleural membrane |
| d |
| A type of Muscle |
| Each lung is enclosed in two membranes, the pleura. The inner membrane is called the visceral pleuron and the outer membrane is called parietal pleuron. A very narrow space exists between the two pleura. It is called the pleural cavity and contains a watery fluid called the pleural fluid that lubricates the pleura. Periosteum is the outer membrane of the bone. Perichondrium is a layer that surrounds the cartilage and pericardium is the membrane that encloses the pericardial cavity, containing the vertebrate heart. |
| Respiratory organs |

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| Skin is an accessory organ of respiration in  1990 |
| Humans |
| Frog |
| Rabbit |
| Lizard |
| b |
| Amphibian |
| In addition to lungs, skin is also an organ of respiration in frog. It is practically the only mode of respiration when the frog is under water or hibernating. Skin is richly supplied with blood and is permeable to gases. That is why frogs always stay near water to keep their skin moist. It is further kept moist by secretion of mucus from its glands and does not become dry out of water. |
| Respiratory organs in various organisms |

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| Select the correct events that occur during inspiration.  (1) Contraction of diaphragm  (2) Contraction of external inter-costal muscles  (3) Pulmonary volume decreases  (4) Intra pulmonary pressure increases  2019 |
| (1) and (2) |
| (3) and (4) |
| (1), (2) and (4) |
| only (4) |
| a |
| While breathing |
| Inspiration is initiated by the contraction of diaphragm that increases the volume of thoracic chamber in the antero-posterior axis. The contraction of external intercostal muscles lifts up the ribs and the sternum causing an increase in the volume of the thoracic chamber in the dorsoventral axis. The overall increase in the thoracic volume causes a similar increase in pulmonary volume. An increase in pulmonary volume decreases the intra-pulmonary pressure to less than the atmospheric pressure which forces the air from outside to move into the lungs. |
| Human respiratory system |

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| Tidal volume and expiratory reserve volume of an athlete is and respectively. What will be his expiratory capacity if the residual volume is ?  2019 |
|  |
| 1500 mL |
| 1700 mL |
| 2200 mL |
| b |
| Volume of Respiration |
| Expiratory capacity is the total volume of air a person can expire after normal inspiration. It includes tidal volume (TV) and expiratory reserve volume (ERV). |
| Human respiratory system |

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| Select the correct statement.  Odisha NEET 2019 |
| Expiration occurs due to external intercostal muscles. |
| Intrapulmonary pressure is lower than the atmospheric pressure during inspiration. |
| Inspiration occurs when atmospheric pressure is less than intrapulmonary pressure. |
| Expiration is initiated due to contraction of diaphragm. |
| b |
| The pressure maintained in inspiration |
| The correct answer is Intrapulmonary pressure is lower than the atmospheric pressure during inspiration. |
| Steps in respiration |

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| Lungs are made up of air-filled sacs, the alveoli. They do not collapse even after forceful expiration, because of  2017 |
| inspiratory reserve volume |
| tidal volume |
| expiratory reserve volume |
| residual volume. |
| d |
| Volume of respiration |
| The correct answer is Residual volume is the volume of air which remains in the lungs after the most forceful expiration. This residual air enables the lungs to continue exchange of gases even after maximum exhalation. Due to this, lungs do not collapse even after forceful expiration. |
| alveoli |

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| Lungs do not collapse between breaths and some air always remains in the lungs which can never be expelled because  NEET-II 2016 |
| there is a negative pressure in the lungs |
| there is a negative intrapleural pressure pulling at the lung walls |
| there is a positive intrapleural pressure |
| pressure in the lungs is higher than the atmospheric pressure. |
| b |
| Pressure in lung walls |
| the correct answer is negative Intrapleural pressure is the pressure of air within the pleural cavity. Intrapleural pressure is always negative, which acts like a suction to keep the lungs inflated and prevent them from collapsing. The negative intrapleural pressure is due to three main factors: surface tension of the alveolar fluid; elasticity of lungs; elasticity of thoracic wall. Normally, there is a difference between intrapleural and intrapulmonary pressure, which is called transpulmonary pressure. This transpulmonary pressure creates the suction to keep the lungs inflated. If there is no pressure difference, there is no suction and lungs will collapse. |
| Residual volume |

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| Which one of the following is a possibility for most of us in regard to breathing, by making a conscious effort?  Mains 2011 |
| One can breathe out air totally without oxygen. |
| One can breathe out air through Eustachian tube by closing both nose and mouth. |
| One can consciously breathe in and breathe out by moving the diaphragm alone, without moving the ribs at all. |
| The lungs can be made fully empty by forcefully breathing out all air from them. |
| b |
| Mechanism of breathing |
| The correct answer is One can breathe out air totally without oxygen. |
| Respiratory volume and capacities |

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| Listed below are four respiratory capacities (i-iv) and four jumbled respiratory volumes of a normal human adult.  Respiratory Respiratory  capacities  volumes  (i) Residual volume  (ii) Vital capacity  (iii) Inspiratory reserve volume  (iv) Inspiratory capacity  Which one of the following is the correct matching of two capacities and volumes? |
| (ii) ,(iii) |
| (iii) , |
| (iv) ,(iv) |
| (i) ,(iii) (ii) |
| c |
| Volume |
| Respiratory capacities Respiratory volumes  Residual volume  Vital capacity  Inspiratory reserve volume  Inspiratory capacity |
| Respiratory volumes and capacities |

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| What is vital capacity of our lungs?  2009 |
| Inspiratory reserve volume plus expiratory reserve volume |
| Total lung capacity minus residual volume |
| Inspiratory reserve volume plus tidal volume |
| Total lung capacity minus expiratory reserve volume |
| b |
| Volume of lungs |
| Vital capacity is the amount of air which one can inhale or exhale with maximum effort. It is the sum of tidal volume, inspiratory reserve volume and expiratory reserve volume, while total lung capacity (TLC) is the total amount of air present in the lungs and the respiratory passage after a maximum inspiration. It is the sum of the vital capacity (VC) and the residual volume (RV). TLC . So, vital capacity is also total lung capacity (TLC) - residual volume . |
| Vital capacity |

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| Which one of the following statements is incorrect?  2006 |
| The principle of countercurrent flow facilitates efficient respiration in gills of fishes. |
| The residual air in lungs slightly decreases the efficiency of respiration in mammals. |
| The presence of non-respiratory air sacs, increases the efficiency of respiration in birds. |
| In insects, circulating body fluids serve to distribute oxygen to tissues. |
| b |
| Respiration rate in different organisms |
| The residual air is the air that remains in the lungs after the most forceful expiration. The residual air remains in the lungs. Hence, it has no effect on respiration efficiency in mammals. The presence of non-respiratory air sacs increases the efficiency of respiration in birds. These air sacs increase the metabolic rate in birds. In insects, circulating body fluids serve to distribute oxygen to tissues. Countercurrent oxygen flow is the flow of blood through the gills in the opposite direction as the water flowing over the gills. This facilitates efficient respiration in gills of fishes. Thus, the correct answer is 'The residual air in the lungs slightly decreases the efficiency of respiration in mammals. |
| Respiratory organs in various organisms |

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| When air is in the lungs, it is called  1996 |
| residual volume |
| inspiratory reserve volume |
| vital capacity |
| tidal volume. |
| a |
| Inspiratory reserve volume |
| The correct answer is Residual volume is the amount of air that remains in the lungs after forcible expiration. It is about . It enables the lungs to continue exchange of gases even after maximum exhalation or holding the breath. Inspiratory reserve volume is the extra amount of air which can be inhaled forcibly after a normal inspiration. It is about 2000 to . Vital capacity is the amount of air which one can inhale and also exhale with maximum effort. It is about 3.5 - 4.5 liters. Tidal volume is the volume of air normally inspired or expired in one breath without any effort. |
| Residual volume |

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| The ventilation movements of the lungs in mammals are governed by  1995 |
| muscular walls of lung |
| diaphragm |
| intercostal muscles |
| both diaphragm and intercostal muscles. |
| d |
| Inspiration and expiration |
| The ventilation movements of the lungs in mammals are governed by diaphragm and intercostal muscles (between the ribs). The method is as follows: |
| Steps in respiration |

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| In man and mammals, air passes from outside into the lungs through  1994 |
| nasal cavity, larynx, pharynx, trachea, bronchi, alveoli |
| nasal cavity, larynx, pharynx, trachea, bronchioles, alveoli |
| nasal cavity, pharynx, larynx, trachea, bronchioles, bronchi, alveoli |
| nasal cavity, pharynx, larynx, trachea, bronchi, bronchioles, alveoli. |
| d |
| Passage of air in Respiration |
| Air passes from the external nares into the nasal cavity where the dust particles are trapped. From nasal cavity, the air moves into pharynx which is a short, vertical tube. It further leads into two tubes, trachea and oesophagus. Larynx is the upper part of trachea. Besides forming a part of the respiratory tract, it also serves as the voice box. Trachea is a thin-walled tube that extends downward through the neck. It divides into two primary bronchi which on entering the lungs divide into fine branches called bronchioles which enter the alveoli. Exchange of gases occur in alveoli. |
| Respiratory organs in various organisms |

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| The partial pressures (in ) of oxygen and carbon dioxide at alveoli (the site of diffusion) are |
| and |
| and |
| and |
| and |
| b |
| Alveoli Pressure |
| The partial pressure (in ) of oxygen and carbon dioxide at alveoli are 104 and 40 respectively. |
| Alveoli |

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| The partial pressure of oxygen in the alveoli of the lungs is  NEET-II 2016 |
| equal to that in the blood |
| more than that in the blood |
| less than that in the blood |
| less than that of carbon dioxide. |
| b |
| Pressure in alveoli |
| The partial pressure of oxygen in alveolar air is whereas it is in deoxygenated blood and in oxygenated blood. |
| Alveoli |

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| The figure given below shows a small part of human lung where exchange of gases takes place. Select the option which represents labelled part or D) correctly identified along with its function.    2011 |
| C: Arterial capillary - Passes oxygen to tissues |
| A : Alveolar cavity - Main site of exchange of respiratory gases |
| D : Capillary wall - Exchange of and takes place here |
| B : Red blood cells - Transport of mainly |
| b |
| Matching the functions of organs |
| The correct answer is alveolar cavity - main site of exchange of respiratory gases. Only alveolar cavity andred blood cell are correctly identified. And among the two, red blood cell carries both CO2 as well as O2 and hence it is wrong. Alveolar cavity is the site of exchange of respiratory gases. Hence it is the correct answer. |
| Exchange of gases |

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| The exchange of gases in the alveoli of the lungs takes place by  (a) passive transport  (b) active transport  (c) osmosis  (d) simple diffusion 22. In lungs, the air is separated from the venous blood through  1990 |
| transitional epithelium + tunica externa of blood vessel |
| squamous epithelium + endothelium of blood vessel |
| squamous epithelium + tunica media of blood vessel |
| none of the above. |
| d |
| Partial pressure of oxygen in alveoli |
| Diffusion is the net flow of a substance from a region of higher concentration to a region of lower concentration. The exchange of gases between the alveoli and blood in the lung is the result of difference in partial pressure of respiratory gases. The partial pressure of oxygen of the alveolar air is higher than the of blood in alveolar capillaries, thus diffuses rapidly from the alveolar air into the blood of alveolar capillaries. The of blood reaching the alveolar capillaries is higher than the of alveolar air. Therefore, diffuses into the alveolar air. |
| Partial pressures of oxygen and carbon dioxide at various places |

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| The alveolar epithelium in the lung is  1990 |
| non-ciliated columnar |
| non-ciliated squamous |
| ciliated columnar |
| ciliated squamous. |
| b |
| Very thin wall |
| The correct answer is non ciliated epithelium; In lungs, the air is separated from the venous blood through squamous epithelium and endothelium of blood vessel. As a result, the barriers between the air in an alveolus and the blood in its capillaries is only about . 23.The alveoli have a very thin (0.0001 mm thick) wall composed of simple moist, nonciliated, squamous epithelium. The number of alveoli is countless and their surface area enormous. This further accelerates the gaseous exchange in the alveoli. |
| Alveoli |

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| Under normal physiological conditions in human being every of oxygenated blood can deliver of to the tissues. |
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|  |
| b |
| Average of Heamoglobin in blood |
| In a normal person, about 15 g haemoglobin is present per 100 mL of blood. 1 g of hemoglobin combines with 1.34 mL O2. Therefore, 100 mL oxygenated blood carries around 20 mL of oxygen (15×1.34=20.1). Out of 20 mL of O2 in every 100 mL of oxygenated blood, 5 mL of O2 is supplied to the tissues under normal conditions. |
| Exchange of gases |

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| Elect the favourable conditions required for the formation of oxyhaemoglobin at the alveoli. |
| Low , low , more , higher temperature |
| High , low , less , lower temperature |
| Low , high , more , higher temperature |
| High , high , less , higher temperature |
| b |
| Partial pressure in alveoli |
| The correct Answer is High pO2, Low pCO2, less H+, lower temperature. pO2: The higher the partial pressure of oxygen, the more efficiently haemoglobin binds to oxygen. Temperature: Normal body temperature promotes hemoglobin-oxygen binding. The dissociation of oxygen from haemoglobin is caused at high temperatures. pCO2: A large amount of carbon dioxide reduces the formation of oxyhemoglobin. Carbon dioxide has a higher affinity for haemoglobin than oxygen.H+ : An increase in the concentration of hydrogen ions or a decrease in pH causes haemoglobin dissociation to increase. |
| Partial pressures of oxygen and carbon dioxide at various places |

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| Identify the wrong statement with reference to transport of oxygen. |
| Binding of oxygen with haemoglobin is mainly related to partial pressure of . |
| Partial pressure of can interfere with binding with haemoglobin. |
| Higher conc. in alveoli favours the formation of oxyhaemoglobin. |
| Low in alveoli favours the formation of oxyhaemoglobin. |
| c |
| Oxyhaemoglobin |
| The correct answer is Higher H+ conc. in alveoli favours the formation of oxyhaemoglobin. RBCs contain haemoglobin, a red-colored iron-containing pigment. O2 can attach to haemoglobin and generate oxyhaemoglobin in a reversible manner. The partial pressure of O2 is the most important factor in oxygen binding to haemoglobin. Other factors that can interfere with this binding include CO2 partial pressure, hydrogen ion concentration, and temperature. The parameters are all favourable for the synthesis of oxyhaemoglobin in the alveoli, which have a high pO2, low pCO2, reduced H+ content, and lower temperature. The circumstances for dissociation of oxygen from oxyhaemoglobin are favourable in tissues with low pO2, high pCO2, high H+ content, and higher temperature. |
| Partial pressures of oxygen and carbon dioxide at various places |

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| Reduction in of blood will  NEET-I 2016 |
| decrease the affinity of haemoglobin with oxygen |
| release bicarbonate ions by the liver |
| reduce the rate of heartbeat |
| reduce the blood supply to the brain. |
| a |
| High amount of bicarbonate ions in the blood |
| The correct answer is decrease the affinity of haemoglobin with oxygen.The pH in blood plays an important role. A decrease in pH indicates high amount of bicarbonate ions in the blood. According to Bohr, lower pH will result in more delivery of oxygen by haemoglobin. This results in a rightward shift in the Oxygen-Hemoglobin Dissociation Curve in oxygen transport, resulting in increased oxygen unloading by haemoglobin. |
| Exchange of gases |

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| Approximately seventy percent of carbon dioxide absorbed by the blood will be transported to the lungs |
| as bicarbonate ions |
| in the form of dissolved gas molecules |
| by binding to |
| as carbamino - haemoglobin. |
| a |
| Blood ph is high |
| The correct answer is as bicarbonate ions. Blood plays an important role in transporting O2 and CO2. Nearly 7% of CO2 is carried through plasma in a dissolved state. About 20-25% of CO2 is transported by RBCs as carbamino-hemoglobin. Majority of CO2 (approximately 70%) is carried to the lungs as bicarbonate ions (HCO3–). |
| Exchange of gases |

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| A large proportion of oxygen remains unused in the human blood even after its uptake by the body tissues. This |
| acts as a reserve during muscular exercise |
| raises the of blood to of |
| is enough to keep oxyhaemoglobin saturation at |
| helps in releasing more to the epithelial tissues. |
| a |
| O2 transport is mainly for |
| The correct answer is acts as a reserve during muscular exercise. Even after the uptake of oxygen by the body tissues, a large proportion of oxygen remains unused in the human blood. This oxygen acts as a reserve during muscular exercise. |
| Transport of gases |

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| Bulk of carbon dioxide released from body tissues into the blood is present as  Mains 2011 |
| bicarbonate in blood plasma and RBCs |
| free in blood plasma |
| carbamino-haemoglobin and as bicarbonate |
| carbamino-haemoglobin in RBCs. |
| a |
| Oxygenation of heamoglobin |
| The correct answer is Bicarbonate in blood plasma and RBCs; The larger part of carbon dioxide released from body tissues into the blood is transported as a bicarbonate ion in blood plasma and RBCs i.e.,61%. In the lungs, the diffusion of oxygen into the blood triggers reactions. The oxygen reacts with attaches with haemoglobin. This oxygenation reaction with haemoglobin forms excess H+ ions which react with bicarbonate ion (HCO3-) and produce carbonic acid(H2CO3). When diffuses from tissues into the blood then it is acted upon by the enzyme carbonic anhydrase. The carbonic acid gets decomposed into which diffuses out of the blood. |
| Transport of gases |

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| What is true about RBCs in humans? |
| They carry about 20-25 percent of . |
| They transport 99.5 percent of . |
| They transport about 80 percent oxygen only and the rest 20 percent of it is transported in dissolved state in blood plasma. |
| They do not carry at all. |
| a |
| Carrier of O2 |
| Blood is the medium of transport for and . About 97 percent of is transported by in the blood. The remaining 3 percent of is carried in a dissolved state through the plasma. Nearly 20-25 percent of is transported by whereas 70 percent of it is carried as bicarbonate. About 7 percent of is carried in a dissolved state through plasma. |
| Transport of gases |

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| The haemoglobin of a human fetus  2009 |
| has only 2 protein subunits instead of 4 |
| has a higher affinity for oxygen than that of an adult |
| has a lower affinity for oxygen than that of the adult |
| its affinity for oxygen is the same as that of an adult. |
| b |
| Alpha and beta subunits-genes |
| Oxygen is needed for aerobic respiration and diffuses from a region of high to low concentration from the mother's blood to the blood of the fetus. The haemoglobin of the fetus has a higher affinity for oxygen than that of adult haemoglobin and so the efficiency of exchange is increased. Carbon dioxide, a waste product of aerobic respiration diffuses in the opposite direction. |
| Transport of gases |

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| The majority of carbon dioxide produced by our body cells is transported to the lungs as |
| attached to haemoglobin |
| dissolved in the blood |
| as bicarbonates |
| as carbonates. |
| c |
| Carbamino haemoglobin |
| When systemic arterial blood flows through capillaries, carbon dioxide diffuses from the tissues into the blood. Some carbon dioxide is dissolved in the blood. Some carbon dioxide reacts with haemoglobin to form carbamino haemoglobin. The remaining carbon dioxide is converted to bicarbonate and hydrogen ions. Most carbon dioxide is transported through the blood in the form of bicarbonate ions. |
| Transport of CO2 |

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| Haemoglobin is a type of  1999 |
| carbohydrate |
| respiratory pigment |
| vitamin |
| skin pigment |
| b |
| Carrier of O2 |
| Haemoglobin (Hb) is a conjugated protein. It consists of a basic protein globin joined to a nonprotein group heme. Heme is an iron-porphyrin ring. A mammalian molecule is a complex of 4 heme molecules joined with 4 globin molecules. It is present in and carries from the lungs to the tissues and transports from the tissues to the lungs. |
| Transport of oxygen |

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| How the transport of and by blood happens?  1996 |
| With the help of WBCs and blood serum |
| With the help of platelets and corpuscles |
| With the help of RBCs and blood plasma |
| With the help of RBCs and WBCs |
| c |
| Carrier of gases |
| The transport of and occurs with the help of RBCs and blood plasma. of is transported by and of is carried by plasma. About of is transported in plasma and rest by by binding with and reacts with water to form carbonic acid in RBCs. |
| Transport of O2 and CO2 |

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| At high altitude, the RBCs in the human blood will  1995 |
| increase in number |
| decrease in number |
| increase in size |
| decrease in size |
| a |
| RBC is carrier of O2 |
| The correct answer is increase in number; At high altitudes and low oxygen levels, the kidneys sense an oxygen deficiency in the blood and respond by secreting a hormone called erythropoietin (EPO). EPO stimulates the bone marrow to accelerate the production of RBCs, so the RBC count rises. The increased number of RBCs serves to compensate for the lower availability of oxygen in the lungs |
| Regulation of respiration |

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| Although much is carried in blood, yet blood does not become acidic, because |
| is continuously diffused through the tissues and is not allowed to accumulate 174 |
| in transport, blood buffers play an important role |
| is absorbed by the leucocytes |
| combines with water to form which is neutralised by . |
| b |
| Biocarbonates |
| Buffer is a solution that resists change in pH when an acid or alkali is added or when the solution is diluted. Acidic buffers consists of a weak acid with a salt of the acid. The salt provides the negative ion , which is the conjugate base of the acid HA. An example is carbonic acid and sodium hydrogen carbonate in which molecules and ions are present. About of released combines with water in the RBCs to form carbonic acid. Carbonic acid dissociates into bicarbonate and hydrogen ions. Addition of ions would make the blood acidic. However, most of the hydrogen ions are neutralized by combination with , forming acid haemoglobin. This reduces the acidity of the blood and also releases additional . |
| Transport of gases. |

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| The carbon dioxide is transported via blood to lungs mostly  1995 |
| in combination with haemoglobin only |
| dissolved in blood plasma |
| in the form of bicarbonate ions |
| as carbamino-haemoglobin and as carbonic acid. |
| c |
| Ph is responsible |
| The correct answer is in the form of bicarbonates only; The gases exchanged between the alveoli and blood and between the tissue and blood are transported through the body by the blood. Gases that are mainly transported are Oxygen and Carbon dioxide. Transport of Carbon Dioxide (CO2) It occurs in three ways: Carbonic acid: The CO2 combines with water present in the plasma and forms carbonic acid. About 7% of CO2 is carried this way. Carbamino-hemoglobin: About 20-25% of CO2 binds with the hemoglobin and gets transported. Bicarbonates: About 70% of CO2 gets transported as bicarbonate ions and diffuses through the plasma. Therefore, carbon dioxide is transported to the lungs by the blood in the form of Carbonic acid, Carbamino-hemoglobin, and Bicarbonates. |
| Regulation of respiration |

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| Carbon dioxide is transported from tissues to respiratory surface by only |
| plasma and erythrocytes |
| plasma |
| erythrocytes |
| erythrocytes and leucocytes. |
| a |
| Red blood cells |
| Carbon dioxide is carried by the blood in three forms: physical solution, bicarbonate ions and carbamino haemoglobin. A very small amount of carbon dioxide dissolves in the plasma and is carried as a physical solution. About 70% of carbon dioxide released by respiring tissue cells diffuses into the plasma and then into the erythrocytes (red blood corpuscles). Here, combines with water to form carbonic acid. Carbonic acid dissociates into bicarbonate and hydrogen ions. |
| Transport of gases |

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| When you hold your breath, which of the following gas changes in blood would first lead to the urge to breathe?  2015 Cancelled |
| Falling concentration |
| Rising and falling concentration |
| Falling concentration |
| Rising concentration |
| d |
| Ph will change |
| The correct answer is rising carbon dioxide concentration; When we hold our breath, the amount of CO2 in the body increases. This may lead to a change in the pH of the blood. The changing pH is detected by the chemoreceptors in the blood vessels. This activates the respiratory center of the brain which in turn signals the muscles of respiratory organs. This leads to an urge to release our hold and breathe. |
| Regulation of respiration |

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| The respiratory centres, which control inspiration and expiration, are located in |
| Diencephalon |
| medulla oblongata |
| Cerebellum |
| spinal cord. |
| b |
| Part of metencephalon |
| The respiratory centre is located in the medulla oblongata, that regulates the rate and depth of breathing. The dorsal group of neurons located in the dorsal portion of medulla oblongata regulates inspiration and ventral group of neurons located in the ventrolateral part of medulla oblongata regulates both inspiration and expiration. |
| Respiratory organs |

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| The respiratory centre which regulates respiration is located in  1994 |
| cerebellum |
| medulla oblongata |
| cerebral peduncle |
| the vagus nerve. |
| b |
| Part of metencephalon |
| The correct answer is medulla oblongata; The respiratory center is located in the medulla oblongata which is a part of the metencephalon. This center regulates both the depth and the rate of breathing which includes both inspiration and expiration. The foramen magnum, an aperture at the base of our skull, allows the medulla, the portion of our brain that is closest to the ground, to communicate with our spinal cord. |
| Respiratory organs |

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| Due to increasing air-borne allergens and pollutants, many people in urban areas are suffering from respiratory disorder that cause wheezing due to  2019 |
| reduction in the secretion of surfactant by pneumocytes |
| benign growth on mucous lining of nasal cavity |
| inflammation of bronchi and bronchioles |
| proliferation of fibrous tissues and damage of the alveolar walls. |
| c |
| Tiny and foreign particles |
| Allergens cause bronchial asthma that stimulates release of histamine from mast cells. Symptoms of bronchial asthma are coughing, wheezing (breathing noisily), difficulty in breathing due to inflammation of bronchi and bronchioles. |
| Disorders |

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| which of the following options correctly represents the lung conditions in asthma and emphysema, respectively?  2018 |
| Inflammation of bronchioles; Decreased respiratory surface |
| Increased number of bronchioles; Increased respiratory surface |
| Increased respiratory surface; Inflammation of bronchioles |
| Decreased respiratory surface; Inflammation of bronchioles |
| a |
| Inflammation of lungs and air sac |
| Asthma is a difficulty in breathing causing wheezing due to inflammation of bronchi and bronchioles. Emphysema is a chronic disorder in which abnormal distension of the bronchioles or alveolar sacs of the lungs occurs due to which respiratory surface is decreased for the exchange of oxygen and carbon dioxide. |
| Asthama and emphysema |

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| Which of the following is an occupational respiratory disorder? |
| Anthracis |
| Silicosis |
| Botulism |
| Emphysema |
| b |
| Silicon dust |
| Occupational respiratory disorders are due to the occupation of the individual. Silicosis is an occupational disease that occurs due to the excessive inhalation of silica dust by the workers of mining industry. Long exposure can cause proliferation of fibrous connective tissue (fibrosis) of upper part of lungs causing inflammation. Anthrax and botulism are bacterial diseases of humans caused by Bacillus anthracis and Clostridium botulinum respectively. Emphysema is an abnormal distension of the bronchioles or alveolar sacs of the lungs. |
| Occupational respiratory disorders |

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| Name the chronic respiratory disorder caused mainly by cigarette smoking.  NEET-I 2016 |
| Respiratory acidosis |
| Respiratory alkalosis |
| Emphysema |
| Asthma |
| c |
| COPD |
| Emphysema is a chronic obstructive pulmonary disease (COPD) caused due to cigarette smoking. It is an inflation or abnormal distention of the bronchioles or alveolar sacs of the lungs which causes irreversible distension and loss of elasticity in the walls of alveolar sacs of the lungs. |
| Emphysema |

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| Asthma may be attributed to  NEET-I 2016 |
| inflammation of the trachea |
| accumulation of fluid in the lungs |
| bacterial infection of the lungs |
| allergic reaction of the mast cells in the lungs. |
| d |
| IgE Antibodies Role |
| The correct answer is Asthma due to an allergic condition in which the tissue surrounding the bronchioles of the lungs swell up and compress the bronchioles thus causing difficulty in breathing. This allergy mainly involves IgE antibodies and chemicals like histamine and serotonin from the mast cells. |
| Asthma |

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| Name the pulmonary disease in which alveolar surface area involved in gas exchange is drastically reduced due to damage in the alveolar walls. |
| Pneumonia |
| Asthma |
| Pleurisy |
| Emphysema |
| d |
| Cigarette smoking |
| The correct answer is Emphysema; Emphysema is a long-term condition in which the respiratory surface is dramatically reduced due to damage to the alveolar walls. After expiration, the wall separating nearby alveoli breaks down, and the air stays filled. One of the leading causes is cigarette smoking. |
| Emphysema |

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| Which one of the following is the correct statement for respiration in humans?  2012 |
| Cigarette smoking may lead to inflammation of bronchi. |
| Neural signals from pneumotoxic centre in pons region of brain can increase the duration of inspiration. |
| Workers in grinding and stone-breaking industries may suffer from lung fibrosis. |
| About of carbon dioxide is carried by haemoglobin as carbamino-haemoglobin. |
| c |
| Occupational respiratory disorder where the dust produced |
| In certain industries, especially those involving grinding or stone breaking so much dust is produced that the defense mechanism of the body cannot fully cope with the situation. Long exposure can give rise to inflammation leading to fibrosis (proliferation of fibrous tissues) and thus causing serious lung damage. Workers in such industries should wear protective masks. |
| Occupational respiratory disorder |

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| Blood analysis of a patient reveals an unusually high quantity of carboxyhaemoglobin content. Which of the following conclusions is most likely to be correct?  The patient has been inhaling polluted air containing unusually high content of  2004 |
| carbon disulphide |
| chloroform |
| carbon dioxide |
| carbon monoxide. |
| d |
| Carboxy heamoglobin |
| The correct answer is carbon monoxide; Carbon monoxide (CO) is an air pollutant that is produced by the incomplete combustion of fuels. Automobile exhausts are the main source of carbon monoxide. CO is extremely poisonous since it blocks oxygen transport to tissues. CO binds to haemoglobin and forms carboxyhaemoglobin which is 200-300 times more stable than the oxyhaemoglobin complex. Inhaling polluted air containing a high amount of CO reduces the oxygen-carrying capacity of haemoglobin. This results in breathlessness, headache, cardiovascular disorder, brain damage, etc. |
| Occupational respiratory disorders |

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| When concentration in blood increases breathing becomes |
| shallower and slow |
| there is no effect on breathing |
| slow and deep |
| faster and deeper |
| d |
| Respect to Haemoglobin level |
| The correct answer is faster and deeper. The effect of rising tension is to decrease the affinity of for . Thus, when concentration in blood increases, breathing becomes faster and deeper. |
| Regulation of respiration |