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**Subject: Biology**

**Topic: Breathing and Exchange of Gases**

**M.M. 300 COMPETITIVE TEST**  **Time: 60 Min.**

1. Which is true for diffusion capacity:

|  |  |  |  |
| --- | --- | --- | --- |
| a) N2 > CO2 > O2 | b) CO2 > O2 > N2 | c) O2 > N2 > CO2 | d) N2 > O2 > CO2 |

1. O2 and CO2 carrying capacity of blood is :

|  |  |  |  |
| --- | --- | --- | --- |
| a) 15 ml , 5 ml | b) 20 ml . 4 ml | c) 19.8 ml , 4 ml | d) 20 ml . 4.5 ml |

1. PO2 and PCO2 in oxygenated blood are mm Hg

|  |  |  |  |
| --- | --- | --- | --- |
| a) 95 , 40 | b) 100 , 40 | c) 105 , 40 | d) 98 , 33 |

1. Sodium bicarbonate is formed in :

|  |  |  |  |
| --- | --- | --- | --- |
| a) RBC | b) plasma | c) WBC | d) None of these |

1. Pneumatoxic centre is formed in :

|  |  |  |  |
| --- | --- | --- | --- |
| a) Dorsal part of pons | b) Ventral part of pons | c) Dorsal part of medulla | d) Ventral part of medulla |

1. The surface area of alveoli is :

|  |  |  |  |
| --- | --- | --- | --- |
| a) 10 m2 | b) 100 m2 | c) 1000 m2 | d) 200 m2 |

1. Severe acute respiratory syndrome (SARS):

a) Is caused by a variant of pneumococcus pneumoniae

b) Is caused by a variant of common cold virus (corona virus)

c) Is an acute form of asthma

d) Affects non-vegetarians much faster than the vegetarians

1. After taking a long deep breath, we do not respire for some seconds:

|  |  |  |  |
| --- | --- | --- | --- |
| a) more CO2 in blood | b) more O2 in blood | c) less CO2 in blood | d) less O2 in blood |

1. Identify the correct statement with respect to transport of respiratory gases by blood :

a) Haemoglobin is necessary for transport of carbon dioxide and carbonic anhydrase for transport of oxygen

b) Haemoglobin is necessary for transport of oxygen and carbonic anhydrase for transport of carbon dioxide

c) Only oxygen is transported by blood

d) Only carbon dioxide is transported by blood

1. Residual volume is :

|  |  |
| --- | --- |
| a) less than tidal volume | b) greater than inspiratory volume |
| c) greater than vital capacity | d) greater than tidal volume |

1. What is vital capacity of our lungs?

|  |  |  |  |
| --- | --- | --- | --- |
| a) IRV + ERV | b) TLC – RV | c) IRV + TV | d) TLC – ERV |

1. Book lungs are respiratory organs of :

|  |  |  |  |
| --- | --- | --- | --- |
| a) Mollusca | b) Mammals | c) Spider | d) earthworm |

1. True vocal cords are :

|  |  |  |  |
| --- | --- | --- | --- |
| a) one pair | b) two pair | c) Thicker and longer | d) None of these |

1. Mark the true statement among the following with reference to normal breathing

a) Inspiration is a passive process where as expiration is active

b) Inspiration is a active process where as expiration is passive

c) Inspiration and expiration are active processes.

d) Inspiration and expiration are passive processes

1. Mark the correct pair of muscles involved in the normal inspiration in humans:

|  |  |
| --- | --- |
| a) External and internal inter coastal muscles | b) Diaphragm and abdominal muscles |
| c) Diaphragm and external inter coastal muscles | d) Diaphragm and internal inter coastal muscles |

1. Respiratory processes is regulated by certain specialized centres in the brain. Which of the following can reduce the inspiratory duration upon stimulation

|  |  |
| --- | --- |
| a) Medullary inspiratory centre | b) Pneumatoxic centre |
| c) apneustic centre | d) Chemosensitive centre |

1. CO2 dissociates from carbamino haemoglobin when :

|  |  |
| --- | --- |
| a) PCO2 is high and PO2 is less | b) PO2 is high and PCO2 is less |
| c) PCO2 and PO2 are equal | d) None of above |

1. The oxygen haemoglobin dissociation curve will show a right shift in case of :

|  |  |  |  |
| --- | --- | --- | --- |
| a) High PCO2 | b) high PO2 | c) Low PCO2 | d) Less H+ concentration |

1. Match column I and column II

|  |  |
| --- | --- |
| Column I | Column II |
| A. Earthworm | I. Moist cuticle |
| B. Insects | II. Gills |
| C. Fishes | III. Lungs |
| D. Birds/Reptiles | IV. Trachea |

|  |  |
| --- | --- |
| a) A – II ; B – I ; C – IV ; D – III | b) A – I ; B – IV ; C – II ; D – III |
| c) A – I ; B – III ; C – II ; D – IV | d) A – I ; B – II ; C – IV ; D – III |

1. Which two of the following changes (a-d) usually tend to occur in the plain dwellers when they move to high altitudes (3,500 m or more)?

|  |  |  |  |
| --- | --- | --- | --- |
| A) Increased in red blood cells size | | B) Increased in red blood cells production | |
| C) Increased in breathing rate | | D) Increased in thrombocyte count | |
| a) B and C | b) C and D | c) A and D | d) A and B |

1. Respiratory pigment or oxygen carrier in human’s blood is :

|  |  |  |  |
| --- | --- | --- | --- |
| a) Haemocyanin | b) Haemoglobin | c) haemozoin | d) Lymphocytes |

1. Which is correct?

a) Respiratory centres are not affected by CO2

b) In humans vital capacity is just double the expiratory volume;

c) A human lungs has 103 alveoli

d) During inspiration the lungs expands

1. In the following statement :

(i) Carbonic anhydrase is present in the erythrocytes

(ii) In erythrocytes the carbon dioxide combine with water and form carbonic acid

|  |  |
| --- | --- |
| a) Statement (i) is correct & responsible for (ii) | b) Statement (i) is not correct but (ii) is correct |
| c) Both (i) and (ii) are wrong | d) Statement (i) is correct & not responsible for (ii) |

1. The maximum volume of air a person can breathe in after a forced expiration is :

|  |  |  |  |
| --- | --- | --- | --- |
| a) Vital capacity | b) ERV + TV + IRV | c) TLC – RV | d) All of these |

1. Which of the following statement is incorrect about transport of gases?

|  |  |
| --- | --- |
| a) About 97 % of O2 is transported by RBCs in the blood | b) 3 % of O2 is carried in dissolved state in the plasma |
| c) 20-25 % of CO2 is transported by RBCs | d) 70 % of CO2 is carried in dissolved state in the plasma |

1. Binding of O2 with haemoglobin is primarily related to which of the following factor?

|  |  |  |  |
| --- | --- | --- | --- |
| a) PCO2 | b) PO2 | c) H+ ion concentration | d) Temperature |

1. Where is the respiratory rhythm centre present that has significant ability to maintain the respiratory rhythm to suit the demand of the body tissues?

|  |  |  |  |
| --- | --- | --- | --- |
| a) Cerebrum | b) Medulla | c) Pons varolli | d) Cerebellum |

1. Which of the following is a chronic respiratory disorder in which alveolar walls are damaged due to which respiratory surface is decreased? One of the major cause of this diseases is cigarette smoking?

|  |  |  |  |
| --- | --- | --- | --- |
| a) Asthma | b) Emphysema | c) Silicosis | d) Pneumonia |

1. Adam’s apple is another name of :

|  |  |  |  |
| --- | --- | --- | --- |
| a) sound box in birds | b) Sound box in man | c) Epiglottis | d) thyroid cartilage |

1. The PCO2 level in the expired air under normal condition is approximately.

|  |  |  |  |
| --- | --- | --- | --- |
| a) 46 mm of Hg | b) 100 mm of Hg | c) 33 mm of Hg | d) 116 mm of Hg |

1. The amount of oxygen delivered to tissues by 100 ml of blood under strenuous condition is approximately.

|  |  |  |  |
| --- | --- | --- | --- |
| a) 5mL | b) 50 mL | c) 15 mL | d) 150 mL |

1. Select the incorrect statement:

a) Functional residual volume = expiratory reserved volume + residual volume

b) Inspiratory capacity = inspiratory reserved volume + tidal volume

c) Vital capacity = tidal volume + expiratory reserved volume + inspiratory reserved volume

d) Total lung capacity = expiratory reserved volume + inspiratory reserved volume

1. Binding of Hb to CO2 is facilitated by :

|  |  |  |  |
| --- | --- | --- | --- |
| a) carbonic anhydrase | b) Lactic dehydrogenase | c) Carbonic reductase | d) None of these |

1. The cause of asthma of :

|  |  |
| --- | --- |
| a) Spasm in bronchial muscles | b) Bleeding into pleural cavity |
| c) Infection of trachea | d) Infection of lungs |

1. Affinity of Hb is highest for

|  |  |  |  |
| --- | --- | --- | --- |
| a) O2 | b) CO2 | c) N2 | d) BPG |

1. If man inhales normal concentration of oxygen but also same concentration of CO, he suffers from suffocation because:

a) CO reacts with oxygen which is thus removed from air reaching the lungs

b) CO reacts faster with Hb and products cannot dissociate

c) CO affect vagus nerve

d) CO affect diaphragm and inter coastal muscles

1. Surfactant is :

|  |  |
| --- | --- |
| a) is chemically phospholipid | b) is secreted by type II cell of alveoli |
| c) Prevents lungs alveoli from collapsing | d) All the above |

1. What is correct about oxygen binding with Hb?

|  |  |
| --- | --- |
| a) Oxygen becomes ionic when it binds to Hb | b) Hb and oxygen is readily reversible combinations |
| c) The bond between oxygen and Hb is very loose | d) None of the above |

1. Diffusion membrane consists of :

|  |  |  |  |
| --- | --- | --- | --- |
| a) 1 layer | b) 2 layer | c) 3 layer | d) 4 layer |

1. Match column I and column II

|  |  |
| --- | --- |
| Column I | Column II |
| A. Larynx | I. Lid of larynx |
| B. Trachea | II. Unit of lungs |
| C. Alveoli | III. Voice box |
| D. Epiglottis | IV. Wind pipe |

|  |  |
| --- | --- |
| a) A – IV ; B – I ; C – II ; D – III | b) A – I ; B – II ; C – III ; D – IV |
| c) A – III ; B – IV ; C – II ; D – I | d) A – IV ; B – III ; C – I ; D – II |

1. Bicarbonate formed inside erythrocytes passes out into plasma while chlorides of plasma pass into erythrocytes. This is :

|  |  |  |  |
| --- | --- | --- | --- |
| a) Haldane effect | b) Bohr’s effect | c) Bicarbonate shift | d) Hamburger phenomenon |

1. Match column I and column II

|  |  |
| --- | --- |
| Column I | Column II |
| A. Earthworm | I. Pulmonary |
| B. Human | II. Branchial |
| C. Prawn | III. Tracheal |
| D. Insects | IV. Cutaneous |

|  |  |
| --- | --- |
| a) A – I ; B – II ; C – III ; D – IV | b) A – IV ; B – III ; C – II ; D – I |
| c) A – IV ; B – I ; C – II ; D – III | d) A – IV ; B – III ; C – I ; D – II |

1. Gases diffuse over the respiratory surface because of :

|  |  |
| --- | --- |
| a) PO2 is more in blood than in tissue | b) PO2 is more in alveoli than in blood |
| c) PCO2 is more in blood than in tissue | d) PCO2 is more in alveoli than in blood |

1. Thoracic cage of man is made of :

|  |  |
| --- | --- |
| a) Ribs and sternum | b) Ribs and thoracic vertebrate |
| c) Ribs , sternum and lumbar vertebrate | d) Ribs , sternum and thoracic vertebrate |

1. About 1000 ml of air is always is known to remain inside the human lungs. It is described as:

|  |  |  |  |
| --- | --- | --- | --- |
| a) TV | b) RV | c) IRV | d) ERV |

1. Which diseases is irreversible?

|  |  |  |  |
| --- | --- | --- | --- |
| a) Emphysema | b) Asthma | c) Pneumonia | d) bronchitis |

1. Which of the following statement is not true?

|  |  |
| --- | --- |
| a) The PCO2 in the alveolar air is 40 mm Hg | b) The PO2 in the alveolar air is 104 mm Hg |
| c) The PCO2 in the deoxygenated blood is 40 mm Hg | d) The PO2 in the deoxygenated blood is 40 mm Hg |

1. Bohr’s effect occurs near

|  |  |  |  |
| --- | --- | --- | --- |
| a) Lungs | b) Tissue | c) Both (a) and (b) | d) None of these |

1. One gram Hb can carry \_\_\_\_\_\_\_ mL O2

|  |  |  |  |
| --- | --- | --- | --- |
| a) 1.34 mL | b) 15 gm | c) 3.14 mL | d) 2.34 mL |

1. Which of the following structure is present in mediastinum?

|  |  |  |  |
| --- | --- | --- | --- |
| a) Heart | b) Oesophagus | c) Thoracic duct | d) all of these |

1. During inspiration, diaphragm turns

|  |  |  |  |
| --- | --- | --- | --- |
| a) flat | b) dome shape | c) Irregular shape | d) None of these |

1. The percentage of carbon dioxide carried by Hb as carbamino-haemoglobin is :

|  |  |  |  |
| --- | --- | --- | --- |
| a) 70-75 % | b) 5-10 % | c) 20-25 % | d) 80-85 % |

1. Residual volume occurs in :

|  |  |  |  |
| --- | --- | --- | --- |
| a) Alveoli | b) Nostrils | c) trachea | d) Bronchus |

1. Every 200 mL of deoxygenated blood delivers \_\_\_\_\_\_\_\_\_ of CO2 to alveoli.

|  |  |  |  |
| --- | --- | --- | --- |
| a) 4 ml | b) 8 ml | c) 20 ml | d) 40 ml |

1. Which of the following shows maximum solubility in blood plasma?

|  |  |  |  |
| --- | --- | --- | --- |
| a) Oxygen | b) Nitrogen | c) Carbon dioxide | d) Carbon monoxide |

1. Exchange of gases between blood and alveolar air in lungs occurs by:

|  |  |  |  |
| --- | --- | --- | --- |
| a) Active transport | b) Simple diffusion | c) Osmosis | d) All of these |

1. Involuntary breathing is caused by:

|  |  |  |  |
| --- | --- | --- | --- |
| a) Pituitary gland | b) Exocrine gland | c) Cerebral cortex | d) medulla oblongata |

1. Pneumatoxic centre which can moderate the functions of the respiratory rhythm centre is present in :

|  |  |  |  |
| --- | --- | --- | --- |
| a) Thalamus | b) Spinal cord | c) Pons varolli | d) Cerebral hemisphere |

1. Low oxygen tension in blood causes:

|  |  |  |  |
| --- | --- | --- | --- |
| a) Yawning | b) Sneezing | c) Coughing | d) Hiccupping |

1. On high mountains, difficulty in breathing is due to :

|  |  |
| --- | --- |
| a) Decrease in PO2 | b) Increased in CO2 concentration |
| c) Decreased in CO2 concentration | d) All the above |

1. All are the respiratory disorders except:

|  |  |  |  |
| --- | --- | --- | --- |
| a) Asthma | b) Bronchitis | c) Pneumonia | d) Encephalitis |

1. During transportation of gases, to maintain ionic balance chloride ions shift from :

|  |  |  |  |
| --- | --- | --- | --- |
| a) Lungs to blood | b) Blood to lungs | c) RBCs to plasma | d) Plasma to RBCs |

1. When percentage saturation of Hb with O2 is plotted against PO2 the curve obtained is :

|  |  |  |  |
| --- | --- | --- | --- |
| a) J shaped | b) Hyperbola | c) Sigmoid | d) U shaped |

1. The partial pressure of O2 in alveoli of the lungs is :

|  |  |
| --- | --- |
| a) Less than that in the blood | b) Equal to that in the blood |
| c) More than that in the blood | d) Less than that in the carbon dioxide |

1. The characteristics features of Hb is :

|  |  |
| --- | --- |
| a) Presence of copper | b) absence of proteins |
| c) Blue colour | d) reverse union with oxygen |

1. Carbon monoxide combines with Hb to form:

|  |  |  |  |
| --- | --- | --- | --- |
| a) carbamino haemoglobin | b) carboxyhaemoglobin | c) Oxyhaemoglobin | d) Monoxyhaemoglobin |

1. Air filled in dead space is :

|  |  |  |  |
| --- | --- | --- | --- |
| a) 500ml | b) 150 ml | c) 350 ml | d) 1000ml |

1. A molecule of Hb can carry \_\_\_\_\_\_\_ oxygen :

|  |  |  |  |
| --- | --- | --- | --- |
| a) 2 | b) 1 | c) 4 | d) 6 |

1. Diaphragm is characteristics of :

|  |  |  |  |
| --- | --- | --- | --- |
| a) reptiles | b) Birds | c) amphibians | d) mammals |

1. Inter coastal muscles are found attached with :

|  |  |  |  |
| --- | --- | --- | --- |
| a) Digits | b) Ribs | c) Pelvis | d) Skull |

1. Trachea is lined internally by:

|  |  |
| --- | --- |
| a) Simple squamous epithelium | b) Ciliated Pseudostratified epithelium |
| c) Ciliated squamous epithelium | d) Columnar epithelium |

1. Lungs are covered with 2 layered membrane called :

|  |  |  |  |
| --- | --- | --- | --- |
| a) Pericardium | b) Pleura | c) Periosteum | d) Sclera |

1. During inspiration intra pulmonary pressure:

|  |  |  |  |
| --- | --- | --- | --- |
| a) Decreased | b) Increased | c) Unchanged | d) None of these |

1. TV and ERV of an athlete is 500mL and 1000mL respectively. What will be his Expiratory capacity if its RV is 1200mL:

|  |  |  |  |
| --- | --- | --- | --- |
| a) 1500 mL | b) 1700 mL | c) 2200 mL | d) 2700 mL |

1. CO2 dissociates form carbamino haemoglobin when

|  |  |
| --- | --- |
| a) PCO2 is high & PO2 is low | b) PCO2 is low & PO2 is high |
| c) PCO2 & PO2 are equal | d) None of the above |

**[Class =11th]**

**Answers**

|  |
| --- |
| 1. b |
| 1. b |
| 1. a |
| 1. b |
| 1. a |
| 1. b |
| 1. b |
| 1. c |
| 1. b |
| 1. d |
| 1. b |
| 1. c |
| 1. a |
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| 1. b |
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| 1. d |
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| 1. b |
| 1. d |
| 1. c |

**Topic: Breathing & Exchange of Gases**

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