Exercise-1

Marked Questions are for Revision Questions.

ONLY ONE OPTION CORRECT TYPE

SECTION - A # RESPIRATORY ORGAN

1. Book lungs are respiratory structures of -
(1) Arachnida (2) Mollusca (3) Mammals (4) Earthworm

2. In crustacea, respiration occurs through
(1) Tracheae (2) Gills (3) Book lungs (4) skin

3. Respiratory organ of terrrestrial vertebrates are
(1) Gills (2) Lungs (3) Skin (4) Body surface

4. Organism showing anaerobic respiration-
(1) Earthworm (2) Tapeworm (3) Lizard (4) Bat

SECTION - B # ANATOMY AND HISTOLOGY

1. The alveoli and their ducts constitute..... of the respiratory system–
(1) Conducting part (2) respiratory or exchange part
(3) Both conducting as well as respiratory parts (4) Dead space

2. Trachea is internally lined by -
(1) Simple squamous epithelium (2) Simple cuboidal epithelium
(3) Pseudostratified epithelium (4) Stratified cuboidal epithelium

3. Numbers of lobes in right and left lungs respectively of human are –
(1) 2 and 4 (2) 3 and 2 (3) 4 and 2 (4) 6 and 3

4. The movement of true vocal cords in man is controlled by -
(1) Arytenoids cartilage (2) Cricoid cartilage
(3) Thyroid cartilage (4) both (1) and (2)

5. Mammalian lungs contain a large number of alveoli. This is to facilitate -
(1) More space for increasing the total volume of inspired air
(2) More surface area for diffusion of gases
(3) More spongy texture for keeping lungs in proper shape
(4) More nerve supply to keep, the organs working more efficiently

6. Adam's Apple is associated with -
(1) Arytenoid cartilage of larynx (2) Cricoid cartilage of larynx
(3) Thyroid cartilage of larynx (4) All the above

7. Total number of alveoli in both lungs of human is about-
(1) 300 million (2) 100 million (3) 1- 2 million (4) 100,000 -150,000

8. The incomplete cartilagenous rings in trachea are example of -

(1) Fibrous cartilage (2) Calcified cartilage (3) Elastic cartilage (4) Hyaline cartilage

9. Which is the correct pathway of air passage in the respiratory tract of man?

(1) Nasal cavity → pharynx → trachea → larynx → bronchi → bronchioles → alveoli

(2) Nasal cavity → pharynx → larynx → trachea → bronchi → bronchioles → alveoli

(3) Nasal cavity → larynx → pharynx → trachea → bronchi → bronchioles → alveoli

(4) Nasal cavity → larynx → bronchi → pharynx → trachea → bronchioles → alveoli

SECTION - C # MECHANISM OF BREATHING

1. Which one of the following statement(s) is correct?

(A) During expiration, thoracic and the pulmonary volumes reduce leading to intrapulmonary pressure slightly greater than atmospheric pressure

(B) During expiration, the thoracic and the pulmonary volumes reduce leading to intrapulmonary pressure slightly lesser than the atmospheric pressure

(C) We have ability to increase the extent of inspiration and expiration with the help of additional muscles in the abdomen

(D) The volume of air involved in breathing movements can be estimated by spirometer which helps in clinical assessment of pulmonary functions

(1) only A (2) A, B and C (3) B and C (4) A, C and D

2. Rate and depth of respiration shall increase when -

(1) Oxygen concentration increases (2) CO_2 concentration increases

(3) Bicarbonate concentration increases (4) Bicarbonate concentration decreases

3. Breathing rate is lowest while we are -

(1) Playing tennis (2) Delivering orders (3) Eating (4) Sleeping

4. Which is the site of actual diffusion of O_2 and CO_2 between blood and atmospheric air?

(1) Exchange zone of respiratory tract (2) Conducting zone of respiratory tract

(3) Inner pleural membrane. (4) Alveoli only

SECTION - D # RESPIRATORY VOLUME AND CAPACITY

1. What is the amount of air inspired or expired per minute, by a healthy human adult?

(1) 500-1000 ml (2) 6000-8000 ml (3) 1000-1100ml (4) 1200-3000 ml

2. The total volume of air, a person can inspire forcefully after a normal expiration is -

(1) 3500 ml (2) 500 ml (3) 4500 ml (4) 1200 ml

3. Total lung capacity is the -

(1) Volume of air that will remain in the lungs after a normal expiration

(2) The maximum volume of air a person can breath in after a forced expiration

(3) Total volume of air a person can inspire after a normal expiration

(4) Total volume of air accommodated in the lungs at the end of a forced inspiration

4. Tidal volume in human beings is -

(1) 1000 ml (2) 1500 ml (3) 500 ml (4) 4.5 litres

5. Vital capacity of lungs is -
(1) 500 ml (2) 4 – 4.6 L (3) 2.5 – 3.9 L (4) 1.5 – 2.5 L

6. Vital capacity of lung is equal to -
(1) IRV + ERV + TV (2) IRV + ERV + TV -RV
(3) IRV + ERV + TV + RV (4) IRV + ERV

7. Residual volume in the lungs of an average human is -
(1) 500 ml (2) 3-4·5 L (3) 1000 ml (4) 1200 ml

8. Residual air mostly present in -
(1) Alveoli (2) Bronchus (3) Nostrils (4) Trachea

9. Dead space is -
(1) Upper respiratory tract (2) Nasal chambers
(3) Alveolar space (4) Lower respiratory tract

10. Volume of air remaining in lungs after maximal expiratory effort is:
(1) Vital capacity (2) Total lung capacity (3) Tidal volume (4) Residual volume

SECTION - E # EXCHANGE AND TRANSPORT OF GASES

1. Binding of oxygen with haemoglobin is primarily related to pO_2. Which one of the following factors interferes with this binding?
(1) pCO_2 (2) H^+ ion concentration
(3) Temperature (4) All of the above

2. The factor favourable for the formation of oxyhaemoglobin is -
(1) Low pO_2 (2) High pCO_2
(3) Low H^+ concentration (4) High temperature

3. What is the amount of oxygenated blood that can deliver about 5ml of O_2 to the tissues, under normal physiological conditions?
(1) 100 ml. (2) 40 ml. (3) 104 ml (4) 95 ml

4. Which of the following conditions is the most appropriate for the dissociation of CO_2 from carbaminohaemoglobin?
(1) Low P_{CO_2} in the alveoli (2) High P_{O_2} in the alveoli
(3) (1) and (2) both (4) High P_{CO_2} in the alvedi

5. What is the amount of CO_2 that is delivered by every 100 ml of deoxygenated blood?
(1) 100 ml (2) 4 ml (3) 5 ml (4) 10 ml

6. Partial pressure of oxygen in the inspired and expired air respectively is -
(1) 158 and 116 mm Hg (2) 158 and 40 mm Hg
(3) 100 and 95 mm Hg (4) 40 and 95 mm Hg

7. In lungs removal of CO_2 from blood involves -
(1) Influx of Cl^- into RBC (2) Efflux of Na^+ from RBC
(3) Influx of HCO_3^- ions in RBC (4) Effllux of HCO_3^- ions from RBC

8. Oxygen dissociation curve of myoglobin is
(1) Hypobolic (2) Hyperbolic (3) Linear (4) Sigmoid

9. Which of the following gases make most stable combination with haemoglobin of blood?
(1) CO_2 (2) CO (3) O_2 (4) N_2

10. Myoglobin is found in -
(1) Lungs (2) Blood (3) Muscles (4) Red blood corpuscles

11. Hamburger's phenomenon is also known as -
(1) HCO^-_3 shift (2) Na^+ shift (3) H^+ shift (4) Chloride shift

12. Oxygen haemoglobin dissociation curve will shift to right on decrease of -
(1) Acidity (2) Carbon dioxide concentration
(3) Temperature (4) pH

13. Maximum amount of carbon dioxide transport (70-75%) takes place as -
(1) Dissolved in plasma (2) Carbaminohaemoglobin complex
(3) Bicarbonate (4) Carboxyhaemoglobin

14. Percentage of oxygen transported by haemoglobin is -
(1) 97% (2) 100% (3) 49% (4) 3%

15. One molecule of haemoglobin carries -
(1) One molecule of O_2 (2) Two molecules of O_2
(3) Three molecules of O_2 (4) Four molecules of O_2

16. During oxygen transport, oxyhaemoglobin liberates oxygen to the tissues because in tissues -
(1) pO_2 is high and pCO_2 is low (2) Both pO_2 and pCO_2 are low
(3) Both pO_2 and pCO_2 are high (4) pO_2 is low and pCO_2 is high

17. When P_{50} value in blood rises, the affinity of respiratory pigment to combine with O_2 will -
(1) Remain same (2) Rise
(3) Fall (4) First rise and then fall

18. At given pO_2 in blood, dissociation of oxyhaemoglobin will increase, if -
(1) pH of blood falls (2) pH of blood rises
(3) CO_2 concentration in blood falls (4) Free fatty acid concentration in blood falls

19. Oxyhaemoglobin dissociation curve is -
(1) Hyperbolic (2) Sigmoid (3) Straight (4) Constant

20. Exchange of gases between blood and alveolar air takes place through -
(1) Active transport (2) Simple diffusion (3) Osmosis (4) All of these

21. O_2 content in the expired air is -
(1) 4% (2) 20% (3) 25% (4) 16%

22. The content of O_2 in the inhaled air is -
(1) 21% (2) 16% (3) 79% (4) 4%

23. Which statement correctly defines Bohr effect?
(1) Rise in P_{50} with a decrease in CO_2 concentration
(2) Rise in P_{50} with an increase in CO_2 concentration
(3) Rise in P_{50} with an increase in pH and decrease in Pco_2
(4) Fall in P_{50} with a decrease in pH

24. Carbonic anhydrase is found in high concentration in -
(1) Leucocytes (2) Blood plasma (3) Erythrocytes (4) Lymphocytes

SECTION - F # REGULATION

1. Respiratory rhythm centre is located in -
(1) Fore brain (2) Pons (3) Medulla (4) Cerebellum

2. Pneumotaxic centre is located in the -
(1) Cerebellum (2) Cerebrum (3) Medulla oblongata (4) Pons varolii

3. Respiratory centre of brain is stimulated by
(1) Carbon dioxide content in venous blood (2) Carbon dioxide content in the arterial blood
(3) Oxygen content in the venous blood (4) Oxygen content in the arterial blood

4. Which part of the human brain controls the breathing movements?
(1) Cerebrum (2) Cerebellum (3) Diencephalon (4) Medulla oblongata

5. Medullary inspiratory centre is under the control of -
(1) Nervous system (2) Muscular system (3) Endocrine system (4) Circulatory system

SECTION - G # DISORDERS

1. **Match the columns I and II.**

Column-I	**Column-II**
(a) Asthma	(p) Abnormal distension of alveoli
(b) Emphysema	(q) Accumulation of WBCs in the alveoli
(c) Pneumonia	(r) Constriction of bronchi due to allergy

(1) a - r, b - p, c - q (2) a - q, b - p, c - r (3) a - r, b - q, c - p (4) a - q, b - r, c – p

2. If a person living at sea level, migrates to 8000 feet high hill, his blood after about fifteen days will
(1) increase in volume (2) have fewer WBCs
(3) have more plasma (4) have greater number of RBCs and more Hb

3. When food particle enters the wind pipe instead of oesophagus, it gets expelled due to -
(1) Sneezing (2) Coughing (3) Yawning (4) Hiccuping

MISCELLANEOUS QUESTIONS

1. During transport of gases, movement of chloride ions from plasma to erythrocytes to maintain osmotic balance is known as -
(1) Chlorination (2) Hamburger phenomenon
(3) Bicarbonate shift (4) Haldane effect

2. The area of inner suface of bronchioles is -
(1) 1 m^2 (2) 10 m^2 (3) 100 m^2 (4) 1000 m^2

3. Disease aggravated by pollution is -
(1) Haemophilia (2) Rheumatism (3) Scurvy (4) Bronchitis

4. Chloride shift occurs in response to -
(1) HCO_3^- (2) K^+ (3) H^+ (4) Na^+

5. Blood analysis of a patient reveals an unusually high quantity of carboxyhaemoglobin content. The patient must be inhaling polluted air, containing high amount of -
(1) Carbon disulphide (2) Chloroform (3) Carbon dioxide (4) Carbon monoxide

6. Tobacco smoke contains carbon monoxide, which
(1) Reduces the oxygen carrying capacity of blood
(2) Causes gastric ulcers
(3) Raises blood pressure
(4) Is carcinogenic

7. Select the option having correct matchings of certain animals and their respiratory organs.
I. Silver fish - Trachea **II.** Scorpion - Book lung
III. Sea squirt - Pharyngeal gills **IV.** Dolphin - Skin
Options -
(1) II and IV (2) III and IV (3) I and IV (4) I, II and III

8. Arrange the following in order of their increasing values -
I. Tidal volume II. Residual volume
III. Expiratory Reserve Volume IV. Vital capacity
(1) I < II < III < IV (2) I < III < II < IV (3) I < IV < III < IV (4) I < IV < II < III

9. Shift of oxyhaemoglobin curve to left is noticed under -
(1) Normal temperature and pH (2) Low temperature and high pH
(3) Low pH and high temperature (4) Low pH and low temperature

10. All of the following statements are incorrect except -
(1) The H^+ released from carbonic acid combines with haemoglobin to form haemoglobinic acid
(2) Oxyhaemoglobin of erythrocytes is stable compound
(3) More than 70% of carbon dioxide is transported from tissue to the lungs in the form of carbaminohaemoglobin
(4) Oxygen from the alveoli reaches the blood through active transport

11. Carbon dioxide in blood is transported mainly as -
(1) Sodium carbonate (2) Carboxyhaemoglobin
(3) Bicarbonate (4) Methemoglobin

Exercise-2

1. Pleura is double membrane sac which envelops:
(1) Kidneys (2) Brain (3) Lungs (4) Nasal passage

2. At high altitude, RBCs of human blood, will -

(1) Increase in size (2) Increase in number
(3) Decrease in size (4) Decrease in number

3. O_2 and CO_2 are exchanged at the alveolar level by simple diffusion mainly due to the -
(1) Pressure gradient (2) Pulmonary volume (3) Thoracic pressure (4) Atmospheric pressure

4. Emphysema is characterised by -
(1) Abnormal distension of alveoli (2) Pulmonary haemorrhage
(3) Increased number of air sacs (4) Infection of *Mycobacterium tuberculosis*

5. Alveoli become enlarged and damaged with reduced surface area in heavy smokers. This condition is known as -
(1) Silicosis (2) Emphysema (3) Asthma (4) Bronchitis

6. In human beings, concentrations of CO_2 in the inspired and expired air respectively are -
(1) 0·03% and 5·3% (2) 0·4% and 5·0% (3) 0·04% and 3·0% (4) 0·04% and 4 %

7. Gaseous exchange between blood and alveolar air across respiratory membrane occurs by -
(1) Osmosis (2) Diffusion (3) Active transport (4) Phagocytosis

8. Rate and depth of respiration shall increase, when -
(1) Oxygen concentration increases (2) CO_2 concentration increases
(3) Bicarbonate concentration increases (4) Bicarbonate concentration decreases

9. Rate of breathing is controlled by -
(1) The amount of freely available oxygen (2) Muscular functions of the body
(3) Carbon dioxide (4) Stress

10. The blood leaving the lungs has its haemoglobin oxygenated and unloads its oxygen to the tissues, because -
(1) The tissues can absorb O_2 from oxyhaemoglobin
(2) O_2 concentration in tissues is lower and CO_2 concentration higher than that of lungs
(3) O_2 concentration in tissues is higher and CO_2 concentration lower than that of lungs
(4) Oxyhaemoglobin undergoes reduction

11. When pCO_2 rises, the oxyhaemoglobin dissociation curve at 37°C will -
(1) Shift towards right (2) Shift towards left (3) Become irregular (4) Remain unchanged

12. CO_2 is transported as -
(1) Dissolved in blood plasma (2) As bicarbonates in blood plasma and RBC
(3) As carbaminohaemoglobin (4) All of these

13. Amount of O_2 normally carried by 100 mL of oxygenated blood is -
(1) 10 rnL (2) 20 mL (3) 30 mL (4) 40 mL

14. What would happen when blood is acidic?
(1) Affinity of oxygen with haemoglobin Increases
(2) Red blood corpuscles will be produced in greater number
(3) Affinity of oxygen with haemoglobin decreases
(4) There will be no change

15. About 1200 ml of air left in lungs is called -
(1) Tidal volume (2) Inspiratory reserve volume
(3) Residual volume (4) Vital capacity

16. Chloride shift is required for transport of -
(1) Nitrogen (2) Oxygen
(3) Carbon dioxide (4) Carbon dioxide and oxygen

17. Air entering into the lungs is -
(a) Warmed (b) Filtered
(c) Deprived of some oxygen (d) Enriched with CO_2
True statements(s) is/are -
(1) a, b, c and d (2) a and b (3) b and d (4) b and c

18. Even when there is no air in it, human trachea does not collapse due to presence of -
(1) Bony rings (2) Turgid pressure (3) Chitinous rings (4) Cartilaginous rings

19. Volume of air inspired and expired in each breath in normal respiration by man is called -
(1) Tidal volume (2) Total lung capacity (4) Inspiratory capacity (4) Residual volume

20. Oxygen carried in inhalation ultimately reaches -
(1) Bronchioles (2) Bronchus (3) Trachea (4) Alveoli

21. If the CO_2 concentration in the blood increases, the breathing shall -
(1) Increase (2) Decrease (3) Stop (4) No affect.

22. Which one of the following statements is incorrect?
A. Trachea divides at the level of 5^{th} thoracic vertebra into a right and left primary bronchi.
B. Initial bronchioles are supported by complete cartilaginous rings.
C. Each terminal bronchiole gives rise to a number of very thin, irregular walled and vascularised bag-like structure called bronchi.
D. Larynx is a cartilaginous box which help in sound production and hence called the sound box.
(1) A only (2) (B) and (C) only (3) A, D and C (4) B, C and D

23. Diaphragm present in mammals is
(1) Membrane between external and middle ear
(2) Membrane around the brain
(3) Partition between the thoracic and abdominal cavities
(4) Membrane around lungs

24. Which one of these statements is correct?
(1) All animals require a medium for cellular respiration
(2) In all animals oxygen is transported by blood
(3) All animals take oxygen from water or air through gills or lungs
(4) All animals need oxygen for respiration

25. In a mammalian lungs, the rate at which oxygen could be obtained from the air would increase, if -
(1) Tidal volume decreases
(2) The cells lining the alveoli and capillaries were thinner

(3) Blood haemoglobin content were lower
(4) You ascend to a higher altitude

26. The separation of oxygen from oxyhaemoglobin is enhanced in the exercising muscle (Bohr's effect), due to -
(1) oxygen binding to the hemoglobin in the lung
(2) carbon monoxide binding to the oxygenated hemoglobin
(3) carbonic anhydrase
(4) the interaction of lowered pH with oxygenated hemoglobin

27. The trachea, bronchi and bronchioles of man, have all of the following functions except -
(1) Increasing the surface area available for gas exchange
(2) Moistening the incoming air
(3) conducting mucus away from the alveoli
(4) warming the incoming air upto body temperature

28. Which of the following produces negative pressure in your thoracic cavity?
(1) Exhalation
(2) Contraction of diaphragm muscles
(3) Relaxation of the muscles between the ribs
(4) Contraction of the muscles in the walls of stomach

29. Respiration in silkworm is accomplished by - **(NSEB 2012)**
(1) External gills (2) Pulmonary sacs (3) Body wall (4) Spiracles & trachea

30. A person has difficulty in breathing at high altitude, because - **(KVPY_2011_SB)**
(1) Oxygen is likely to diffuse from lungs to blood.
(2) Oxygen is likely to diffuse from blood to lungs
(3) Partial pressure of O_2 is lower than partial pressure of CO_2
(4) Overall intake of O_2 by the blood becomes low.

31. CO_2 in the blood is mostly carried by - **(KVPY_2011_SB)**
(1) Haemoglobin in RBC (2) Cytoplasm of WBC
(3) Plasma as bicarbonate ions (4) Plasma proteins

32. A person inhales certain volume of air by force inspiration after having a forced expiration. This quantity of inhaled air is -
(1) Total lung capacity (2) Tidal volume (3) Vital capacity (4) Inspiratory capacity

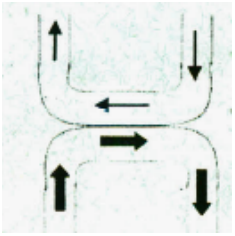
33. Match the following and mark the correct options.

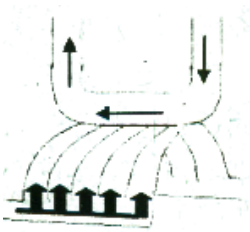
Animal	**Respiratory Organ**
A. Earthworm	i. Moist cuticle
B. Terrestrial Arthropods	ii. Gills
C. Fishes	iii. Lungs
D. Birds / Reptiles	iv. Trachea

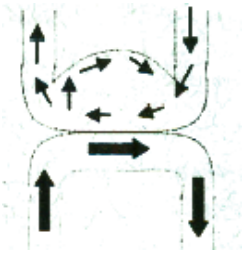
(1) A-ii, B-i, C-iv, D-iii (2) A-i, B-iv, C-ii, D-iii
(3) A-i, B-iii, C-ii, D-iv (4) A-i, B-ii, C-iv, D-iii

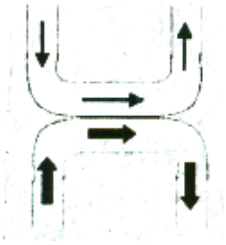
34. The gas transfer system found in Aves is represented in following figures: **(NSEB-2017)**

(Bold arrows represent blood flow while thin arrows represent air flow through respiratory stem.) The correct representation is in the figure:

(1) 

(2) 

(3) 

(4) 

Exercise-3

PART - I : NEET / AIPMT QUESTION (PREVIOUS YEARS)

1. Which one of the following statements is incorrect **(AIPMT-2006)**
(1) The residual air in lungs, decreases the efficiency of respiration slightly, in mammals
(2) The presence of non respiratory air sacs, increases the efficiency of respiration in birds
(3) In insects, circulating body fluids serve to distribute oxygen to tissues
(4) The principle of conter-current flow facilitates efficient respiration in gills of fishes

2. Increased attacks of bronchial asthma, in certain seasons are related to - **(AIPMT Pre.-2007)**
(1) eating fruits preserved in tin containers (2) inhalation of seasonal pollens
(3) low temperature (4) hot and humid environment

3. What is vital capacity of our lungs? **(AIPMT-2008)**
(1) Inspiratory reserve volume plus tidal volume
(2) Total lungs capacity minus expiratory reserve volume
(3) Inspiratory reserve volume plus expiratory reserve volume
(4) Total lung capacity minus residual volume

4. During inspiration, the diaphragm **(AIPMT-2008)**
(1) Expands (2) Shows no change
(3) Contracts and flattens (4) Relaxes to become dome-shaped

5. The epithelial tissue present on the inner surface of bronchioles and fallopian tubes is- **(AIPMT Pre.-2009)**
(1) Glandular (2) Ciliated (3) Squamous (4) Cuboidal

6. Listed below are four respiratory capacities (I-IV) and four jumbled respiratory volumes of a normal human adult. **(AIPMT Pre.- 2010)**

Respiratory capacity	Respiratory Volume
I- Residual volume	2500 mL

II- Vital capacity	3500 mL
III- Inspiratory reserve volume	1200 mL
IV- Inspiratory capacity	4500 mL

Which one of the following is the correct matching of two capacities and volumes?

(1) II 2500 mL, III 4500 mL (2) III 1200 mL, IV 2500 mL

(3) IV 3500 mL, I 1200 mL (4) I 4500 mL, II 3500 mL

7. What is true about RBCs in humans? **(AIPMT-Pre 2010)**

(1) They carry about 20-25 per cent of carbon dioxide

(2) They transport 99.5 per cent of oxygen

(3) They transport about 80 per cent oxygen only and the rest 20 per cent of it is transported in dissolved state in blood plasma

(4) They do not carry carbon dioxide at all

8. Which one of the following is a possibility for most of us, in regard to breathing, by making a *conscious effort*? **(AIPMT Mains-2011)**

(1) One can breathe out air totally without oxygen

(2) One can breathe out air through eustachian tubes by closing both the nose and the mouth

(3) One can consiously breathe in and breathe out by moving the diaphragm alone, without moving the ribs at all

(4) The lungs can be made to be fully empty, by forcefully breathing out, total air from within

9. Bulk of carbon dioxide (CO_2) released from body tissues into the blood is present as **(AIPMT Mains-2011)**

(1) Bicarbonate in blood plasma and RBCs

(2) Free CO_2 in blood plasma

(3) 70% carbaminohaemogolobin and 30% as bicarbonate

(4) Carbamino-haemoglobin in RBCs

10. People who have migrated from the planes to an area adjoining Rohatang pass about six months back

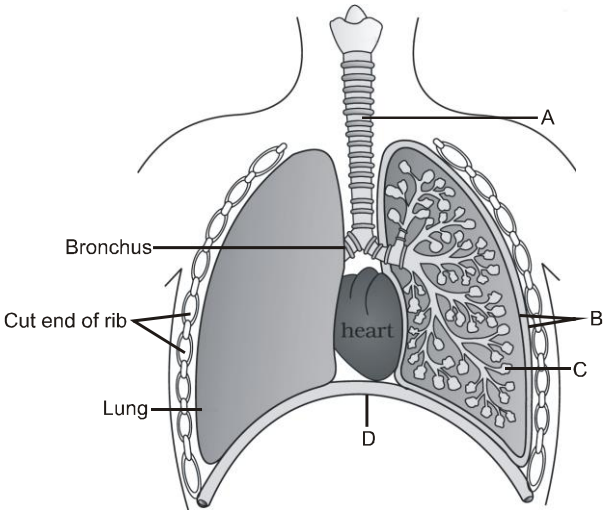
(1) Have more RBCs and their haemoglobin has a lower binding affinity to O_2 **(AIPMT Pre.-2012)**

(2) Are not physically fit to play games like football

(3) Suffer from altitude sickness with symptoms like nausea, fatigue, etc

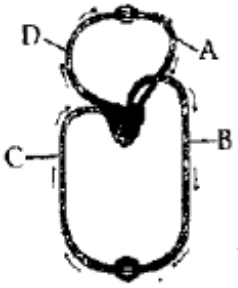
(4) Have the usual RBC count but their haemoglobin has very high binding affinity to O_2

11.# The figure shows a diagrammatic view of human respiratory system with labels A, B, C and D. Select the option which gives correct identification and main function and/or characteristics. **(NEET-2013)**



(1) B-pleural membrane-surround ribs on both sides to provide cushion against rubbing.
(2) C-Alveoli-thin walled vasuclar bag like structures for exchange of gases.
(3) D-Lower end of lungs-diaphragm pulls it down during inspiration
(4) A-trachea-long tube supported by complete cartilaginous rings for conducting inspired air.

12.# Figure shown schematic plan of blood circulation in humans with labels A to D. Identify the label and give its function/s. **(NEET-2013)**



(1) B - Pulmonary artery - takes blood from heart to lungs, PO_2 = 90mm Hg
(2) C - Vena Cava - takes blood from body parts to right auricle, PCO_2 = 45mm Hg
(3) D - Dorsal aorta - takes blood fromHeart to body Part PO_2 = 95mm Hg
(4) A - Pulmonary vein - takes impure blood from body parts, PO_2 = 60 mm Hg

13. When you hold your breath, the change in concentration of which gas in blood would first lead to the urge to breathe? **(AIPMT-2015)**

(1) Rising CO_2 concentration (2) Falling CO_2 concentration
(3) Rising CO_2 and falling O_2 concentration (4) Falling O_2 concentration

14. Name the pulmonary disease in which alveolar surface area involved in gas exchange is drastically reduced due to damage in the alveolar walls - **(Re-AIPMT-2015)**

(1) Emphysema (2) Pneumonia (3) Asthma (4) Pleurisy

15. Asthma may be attributed to - **(NEET-1-2016)**
(1) Accumulation of fluid in the lungs
(2) Bacterial infection of the lungs
(3) Allergic reaction of the mast cells in the lungs
(4) Inflammation of the trachea

16. It is much easier for a small animal to run uphill than for a large animal, because: **(NEET-1-2016)**
(1) The efficiency of muscles in large animals is less than in the small animals.
(2) It is easier to carry a small body weight.
(3) Smaller animals have a higher metabolic rate.
(4) Small animals have a lower O_2 requirement.

17. The partial pressure of oxygen in the alveoli of the lungs is **(NEET-1-2016)**
(1) Less than that of carbon dioxide (2) Equal to that in the blood
(3) More than that in the blood (4) Less than that in the blood

18. Lungs do not collapse between breaths and some air always remains in the lungs which can never be expelled because - **(NEET-1-2016)**
(1) Pressure in the lungs is higher than the atmospheric pressure
(2) There is a negative pressure in the lungs
(3) There is a negative intrapleural pressure pulling at the lung walls
(4) There is a positive intrapleural pressure

19. Lungs are made up of air-filled sacs, the alveoli. They do not collapse even after forceful expiration because of **(NEET-2017)**
(1) Residual Volume (2) Inspiratory Reserve Volume
(3) Tidal Volume (4) Expirtory Reserve Volume

20. Which of the following is an occupational respiratory disorder? **(NEET-2018)**
(1) Anthracis (2) Emphysema (3) Botulism (4) Silicosis

21. Match the items given in Column I with those in Column II and select the *correct* option given below: **(NEET-2018)**

Column I	**Column II**
a. Tidal volume	i 2500– 3000 mL
b. Inspiratory Reserve volume	ii 1100– 1200 mL
c. Expiratory Reserve volume	iii 500– 550 mL
d. Residual volume	iv. 1000– 1100 mL

	a	**b**	**c**	**d**
(1)	ii	ii	i	iv
(2)	iv	iii	ii	i
(3)	i	iv	ii	iii
(4)	iii	i	iv	ii

22. Which of the following options correctly represents the lung conditions in asthma and emphysema, respectively? **(NEET-2018)**
(1) Inflammation of bronchioles; Decreased respiratory surface
(2) Decreased respiratory surface; Inflammation of bronchioles
(3) Increased respiratory surface; Inflammation of bronchioles
(4) Increased number of bronchioles; Increased respiratory surface

23. Tidal Volume and Expiratory Reserve Volume an athlete is 500 mL and 1000 mL respectively. What will be his Expiratory Capacity if the Residual Volume is 1200 mL? **(NEET-1-2019)**

(1) 2700 mL (2) 1500 mL (3) 1700 mL (4) 2200 mL

24. Select the correct statement. **(NEET-2-2019)**

(1) Expiration occurs due to external intercostal muscles.

(2) Intrapulmonary pressure is lower than the atmospheric pressure during inspiration.

(3) Inspiration occurs when atmospheric pressure is less than intrapulmonary pressure.

(4) Expiration is initiated due to contraction of diaphragm.

25. The maximum volume of air a person can breathe in after a forced expiration is known as: **(NEET-2-2019)**

(1) Expiratory Capacity (2) Vital Capacity

(3) Inspiratory Capacity (4) Total Lung Capacity

PART - II : AIIMS QUESTION (PREVIOUS YEARS)

1. Respiration is controlled by **(AIIMS-2009)**

(1) Medulla oblongata (2) Cerebellum (3) Hypothalamus (4) Cerebrum

2. The lining of fallopian tubes, bronchioles and bronchi consists of - **(AIIMS-2010)**

(1) Squamous epithelium (2) Ciliated epithelium

(3) Columnar epithelium (4) Cubical epithelium

3. Chemosensitive area of respiratory centre in medulla is affected by **(AIIMS-2010)**

(1) Less CO_2 and H^+ ions (2) Less O_2 and H^+ ions

(3) Excess CO_2 and H^+ ions (4) Excess O_2 and H^+ ions

4. Oxyhaemoglobin dissociates into oxygen and deoxyhaemoglobin at **(AIIMS-2017)**

(1) low O_2 pressure in tissue (2) high O_2 pressure in tissue

(3) equal O_2 pressure inside and outside tissue (4) all times irrespective of O_2 pressure

5. O_2 dissociation curve is plotted between pO_2 and..... **(AIIMS-2018-I)**

(1) % Hb saturation (2) pCO_2 (3) Hb concentration (4) RBC/mm^3 of blood

6. CO_2 combines with Hb to form: **(AIIMS-2018-II)**

(1) Carbaminohaemoglobin (2) Carboxy haemoglobin

(3) Oxyhaemoglobin (4) Methaemoglobin

Answers

EXERCISE - 1

SECTION - A

1.	(1)	**2.**	(2)	**3.**	(2)	**4.**	(2)

SECTION - B

1.	(2)	**2.**	(3)	**3.**	(2)	**4.**	(1)	**5.**	(2)	**6.**	(3)	**7.**	(1)
8.	(4)	**9.**	(2)										

SECTION - C

1.	(4)	**2.**	(2)	**3.**	(4)	**4.**	(1)

SECTION - D

1.	(2)	**2.**	(1)	**3.**	(4)	**4.**	(3)	**5.**	(2)	**6.**	(1)	**7.**	(4)
8.	(1)	**9.**	(1)	**10.**	(4)								

SECTION - E

1.	(4)	**2.**	(3)	**3.**	(1)	**4.**	(3)	**5.**	(2)	**6.**	(1)	**7.**	(3)
8.	(2)	**9.**	(2)	**10.**	(3)	**11.**	(4)	**12.**	(4)	**13.**	(3)	**14.**	(1)
15.	(4)	**16.**	(4)	**17.**	(3)	**18.**	(1)	**19.**	(2)	**20.**	(2)	**21.**	(4)
22.	(1)	**23.**	(2)	**24.**	(3)								

SECTION - F

1.	(3)	**2.**	(4)	**3.**	(2)	**4.**	(4)	**5.**	(1)

SECTION - G

1.	(1)	**2.**	(4)	**3.**	(2)

MISCELLANEOUS QUESTIONS

1.	(2)	**2.**	(3)	**3.**	(4)	**4.**	(1)	**5.**	(4)	**6.**	(1)	**7.**	(4)
8.	(2)	**9.**	(2)	**10.**	(1)	**11.**	(3)						

EXERCISE - 2

1.	(3)	**2.**	(2)	**3.**	(1)	**4.**	(1)	**5.**	(2)	**6.**	(4)	**7.**	(2)
8.	(2)	**9.**	(3)	**10.**	(2)	**11.**	(1)	**12.**	(4)	**13.**	(2)	**14.**	(3)
15.	(3)	**16.**	(3)	**17.**	(1)	**18.**	(4)	**19.**	(1)	**20.**	(4)	**21.**	(1)
22.	(2)	**23.**	(3)	**24.**	(1)	**25.**	(2)	**26.**	(4)	**27.**	(1)	**28.**	(2)
29.	(4)	**30.**	(4)	**31.**	(3)	**32.**	(3)	**33.**	(2)	**34.**	(2)		

EXERCISE - 3

PART- I

1.	(3)	**2.**	(2)	**3.**	(4)	**4.**	(3)	**5.**	(2)	**6.**	(3)	**7.**	(1)
8.	(3)	**9.**	(1)	**10.**	(1)	**11.**	(2)	**12.**	(2)	**13.**	(1)	**14.**	(1)
15.	(3)	**16.**	(3)	**17.**	(3)	**18.**	(3)	**19.**	(1)	**20.**	(4)	**21.**	(4)
22.	(1)	**23.**	(2)	**24.**	(2)	**25.**	(2)						

PART- II

1.	(1)	**2.**	(2)	**3.**	(3)	**4.**	(1)	**5.**	(1)	**6.**	(1)

Self Practice Paper (SPP)

1. Breathing by ribs is more pronounced in

(1) Male (2) Female

(3) Pregnant female (4) male and female both

2. Wall of alveoli is composed of

(1) Simple squamous epithelium (2) Simple cuboidal epithelium

(3) Pseudostratified epithelium (4) Simple columnar epithelium

3. The alveoli of lungs and villi of intestine in mammals show resemblance in the character that both -

(1) Provide a large surface area

(2) Are lined by ciliated epithelium

(3) Are involved in diffusion of gases

(4) Have scanty supply of blood and lymph capillaries

4. "Methemoglobin" refers to

(1) A colourless respiratory pigment (2) Oxidized haemoglobin

(3) Oxygenated haemoglobin (4) Deoxygeneted haemoglobin

5. If expiratory reserve volume is 1100 ml, residual volume is 1200 ml and tidal volume is 500 ml, what shall be the functional residual capacity?

(1) 1600 ml (2) 2800 ml (3) 2300 ml (4) 1200 ml

6. What percentage of CO_2 flows in blood in form of bicarbonates?

(1) 7% (2) 23% (3) 50% (4) 70%

7. Effect of CO_2 concentration on dissociation of oxyhaemoglobin is called

(1) Bohr's effect (2) Haldane effect

(3) Hamburger effect (4) Gaudi Kov's effect

8. Expiratory muscles contract at the time of -

(1) Deep inspiration (2) Normal inspiration and expiration

(3) Forcefull expiration (4) Normal expiration

9. Intercostal muscles are found attached with:

(1) Pelvic cavity (2) Ribs

(3) Vertebral column (4) Scapula

10. For proper transport of O_2 and CO_2 blood should be -

(1) Slightly acidic (2) Strongly acidic

(3) Strongly alkaline (4) Slightly alkaline

11. The combination of oxygen with haemoglobin is called

(1) Oxidation (2) Oxygenation

(3) Reduction (4) None of the above

12. Each lung is enclosed in a double membrane called as pleura. The membrane which closely covers the lung is -
(1) Lung pleura (2) Visceral pleura
(3) Peritoneal pleura (4) Parietal pleura

13. Respiratory system is derived from -
(1) Ectoderm (2) Endoderm (3) Both (1) & (2) (4) Endo mesoderm

14. The impulse for voluntary muscles for forced breathing starts in?
(1) Medulla oblongata (2) Vagus nerve (3) Cerebellum (4) Cerebrum

15. Lungs of rabbit and man are
(1) Sucken lungs (2) Pressure lungs (3) Aquatic lungs (4) None

16. Signet ring cartilage of larynx is
(1) Cricoid (2) Arytenoid (3) Thyroid (4) All of these

17. Carbonic anhydrase is found in
(1) WBC (2) RBC (3) Blood plasma (4) All

18. In nasal passage, the turbinal bones are present in which of the following groups?
(1) In all vertebrates (2) Amphibia (3) Mammals (4) None

19. Narrowest and most abundant tubes of lungs are
(1) Bronchioles (2) Bronchus (3) Alveoli (4) Trachea

20. Number of tracheal rings in man is
(1) 16 – 20 (2) 20 – 24 (3) 24 – 28 (4) 28 – 32

21. A person suffers punctures in his chest cavity in a accident, without any damage to the lungs. Its effect could be -
(1) Reduced breathing rate (2) Rapid increase in breathing rate
(3) No change in respiration (4) Cessation of breathing

22. Which of the following is correct?
(1) Pulmonary ventilation is equal to alveolar ventilation
(2) Alveolar ventilation is less than pulmonary ventilation
(3) Alveolar ventilation is more than pulmonary ventilation
(4) Alveoler ventilation is twice of the pulmonary ventilation

23. Which is a common passage for food and air?
(1) Trachea (2) Oesophagus
(3) Pharynx (4) Glottis

24. The function of conducting part in respiratory system of human is
(1) Clears foreign particles (2) Humidifies atmospheric air
(3) Brings the air to body temperature (4) All of the above

25. Mark the correct pair of muscles involved in the normal breathing in humans -
(1) External and internal intercostal muscles (2) Diaphragm and abdominal muscles
(3) Diaphragm and external intercostal muscles (4) Diaphragm and internal intercostal muscles

26. Which of the following steps not involved in respiration?

(1) Diffusion of gases across alveolar membrane
(2) Transport of gases by the blood
(3) Provide nutrients, and O_2 to all the living cells of body
(4) Utilisation of O_2 by the cells for catabolic reactions and resultant release of CO_2

27. Inspiration can occur, when
(1) Pressure within the lungs is less than the atmospheric pressure
(2) Pressure within the lungs is more than the atmospheric pressure
(3) Pressure within the lungs and atmospheric air is same
(4) No effect of pressure on inspiration

28. By the contraction in diaphragm volume of thoracic chamber increases in
(1) Dorso-ventral axis (2) Antero-posterior axis
(3) Dorso-posterior axis (4) Antero-ventral axis

29. Which muscles contract during normal expiration
A–Diaphragm
B–EICM
C–IICM
D–Abdominal muscles
(1) A and B (2) C and D
(3) A and C (4) No muscles contract during expiration

30. Select the correct statement.
(1) The contraction of internal intercostal muscles raises the ribs upwards
(2) The RBCs transports oxygen only
(3) Healthy man can inspire approximately 500 ml of air per minute
(4) During expiration, the intrapulmonary pressure is slightly higher than the surrounding atmospheric pressure

31. Which of the following factor can affect the rate of diffusion of gases?
(1) Thickness of the membranes involved in diffusion
(2) Solubility of the gases
(3) Pressure of the gases
(4) All of these

32. Which of the following is correct?

	Alveoli	**Deoxy geneated blood**	**Tissue**
(1)	PO_2 = 159mm Hg	PCO_2 = 40mmHg	PCO_2 = 20mmHg
(2)	PO_2 = 40mm Hg	PCO_2 = 95mmHg	PO_2 = 40mmHg
(3)	PO_2 = 104mm Hg	PCO_2 = 45mmHg	PCO_2 = 45mmHg
(4)	PO_2 = 40mm Hg	PO_2 = 40mmHg	PCO_2 = 45mmHg

33. What is true about diffusion capacity?
(1) Diffusion capacity of CO_2 is much higher than O_2
(2) Diffusion capacity of O_2 is much higher than CO_2
(3) Diffusion capacity of O_2 and CO_2 is same
(4) None of the above

34. Which of the following statement is true?
(1) 20-25 percent CO_2 is transported by RBCs

(2) 97 percent of O_2 is transported by RBCs

(3) 70 percent CO_2 is carried as bicarbonate

(4) All of these are true

35. Binding of oxygen with haemoglobin is primarily related to -

(1) Partial pressure of O_2 (2) Partial pressure of CO_2

(3) H^+ ion concentration (4) Temperature

36. Which of the following factors can interfere in binding of O_2 with haemoglobin?

A- pO_2

B- pCO_2

C- H^+ion concentration

D- Temperature

(1) Only A (2) B, C and D (3) A and D (4) A, B, C and D

37. The conditions which are favourable for the formation of oxyhaemoglobin

(1) $PO_2\uparrow$, $PCO_2\uparrow$, H^+conc. $\downarrow$, Temperature $\downarrow$

(2) $PO_2\downarrow$, $PCO_2\downarrow$, H^+conc. $\uparrow$, Temperature $\uparrow$

(3) $PO_2\uparrow$, $PCO_2\downarrow$, H^+conc. $\downarrow$, Temperature $\downarrow$

(4) $PO_2\uparrow$, $PCO_2\uparrow$, H^+conc. $\downarrow$, Temperature $\uparrow$

38. Which of the following statement/s is / are correct?

A. A high concentration of carbonic anhydrase is present in RBC

B. Minute quantities of carbonic anhydrae is present in plasma

C. Every 100 ml blood delivers approximately 4 ml of CO_2 to the alveoli

D. 20-25% CO_2 is carried by haemoglobin as carbaminohaemoglobin

(1) A, C and D (2) A and D (3) A, B, C and D (4) Only A

39. Which of the following centre can moderate the functions of the respiratory rhythm centre?

(1) Dorsal respiratory centre (2) Ventral respiratory centre

(3) Pneumotaxic centre (4) Chemosensitive centre

40. A chemosensitive area is situated adjacent to respiratory rhythm centre. Which is highly sensitive to _____and _____ions.

(1) O_2, H^+ (2) CO_2, OH^- (3) CO_2, H^+ (4) CO_2, O_2

41. Number of RBCs per unit volume of blood is likely to be higher in a person residing at high altitudes, because :

(1) Air is clean and unpolluted (2) More sun shine is available

(3) Air is less dense (4) Vegetation gives out more O_2

42. The determination of oxygen carried by haemoglobin is done by

(1) pH (2) pO_2 (3) pCO_2 (4) All of the above

43. During transport of CO_2, blood does not become acidic due to -

(1) Neutralization of H_2CO_3 by Na_2CO_3 (2) Absorption of CO_2 by the leucocytes

(3) Blood buffers (4) Non-accumulation of blood at a given point

44. CO is harmful to animals because

(1) It reduces CO_2 transport (2) It reduces O_2 transport

(3) It increases CO_2 transport (4) It forms a stable complex with Hb

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

(1) Inspiration is a passive process where expiration is active process

(2) Inspiration is an active process where expiration is passive process

(3) Inspiration and expiration are active processes

(4) Inspiration and expiration are passive processes

SPP Answers

1.	(3)	**2.**	(1)	**3.**	(1)	**4.**	(2)	**5.**	(3)	**6.**	(4)	**7.**	(1)
8.	(3)	**9.**	(2)	**10.**	(4)	**11.**	(2)	**12.**	(2)	**13.**	(4)	**14.**	(4)
15.	(1)	**16.**	(1)	**17.**	(2)	**18.**	(3)	**19.**	(1)	**20.**	(1)	**21.**	(4)
22.	(2)	**23.**	(3)	**24.**	(4)	**25.**	(3)	**26.**	(3)	**27.**	(1)	**28.**	(2)
29.	(4)	**30.**	(4)	**31.**	(4)	**32.**	(3)	**33.**	(1)	**34.**	(4)	**35.**	(1)
36.	(4)	**37.**	(3)	**38.**	(3)	**39.**	(3)	**40.**	(3)	**41.**	(3)	**42.**	(4)
43.	(3)	**44.**	(4)	**45.**	(2)								