

# Breathing and Exchange of Gases

#### **Mechanism of Breathing**

- 1. Select the correct events that occur during inspiration (2020)
  - 1. Contraction of diaphragm
  - 2. Contraction of external inter-costal muscles
  - 3. Pulmonary volume decreases
  - 4. Intra pulmonary pressure increases
  - a. (3) and (4)
- b. (1), (2) and (4)
- c. Only (4)
- d. (1) and (2)
- 2. Lungs do not collapse between breaths and some air always remains in the lungs which can never be expelled because:

  (2016 II)
  - a. There is a positive intrapleural pressure
  - b. Pressure in the lungs is higher than the atmospheric pressure.
  - c. There is a negative pressure in the lungs.
  - d. There is a negative intrapleural pressure pulling at the lung walls

## **Respiratory Volumes & Capacities**

- **3.** The Total Lung Capacity (TLC) is the total volume of air accomodated in the lungs at the end of a forced inspiration. This includes: (2020-Covid)
  - a. RV; ERV; IC and EC
  - b. RV; ERV; VC (Vital Capacity) and FRC (Functional Residual Capacity)
  - c. RV (Residual volume); ERV (Expiratory Reserve Volume); TV (Tidal Volume); and IRV (Inspiratory Reserve Volume)
  - d. RV; IC (Inspiratory Capacity); EC (Expiratory Capacity); and ERV
- **4.** Tidal Volume and Expiratory Reserve Volume of an athlete is 500 mL and 1000 mL, respectively. What will be his Expiratory Capacity if the Residual Volume is 1200 mL?
  - a. 1500 mL
- b. 1700 mL
- c. 2200 mL
- d. 2700 mL

**5.** Match the items given Column-I with those in Column-II and select the correct option given below (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. A-iii B-ii C-i D-iv
- b. A-iii B-i C-iv D-ii
- c. A-i B-iv C-ii D-iii
- d. A-iv B-iii C-ii D-i
- **6.** Lungs are made up of air-filled sacs the alveoli. They do not collapse even after forceful expiration, because of: (2017-Delhi)
  - a. Residual Volume
- b. Inspiratory Reserve Volume
- c. Tidal Volume
- d. Expiratory Reserve Volume

#### **Exchange and Transport of Gases**

- 7. Select the favourable conditions required for the formation of oxyhaemoglobin at the alveoli. (2021)
  - a. Low pO<sub>2</sub>, high pCO<sub>2</sub>, more H<sup>+</sup>, higher temperature
  - b. High pO<sub>2</sub>, high pCO<sub>2</sub>, less H<sup>+</sup>, higher temperature
  - c. Low pO<sub>2</sub>, low pCO<sub>2</sub>, more H<sup>+</sup>, higher temperature
  - d. High pO<sub>2</sub>, low pCO<sub>2</sub>, less H<sup>+</sup>, lower temperature
- **8.** The partial pressures (in mm Hg) of oxygen (O<sub>2</sub>) and carbon dioxide (CO<sub>2</sub>) at alveoli (the site of diffusion) are: (2021)
  - a.  $pO_2 = 40$  and  $pCO_2 = 45$  b.  $pO_2 = 95$  and  $pCO_2 = 40$
  - c.  $pO_2 = 159$  and  $pCO_2 = 0.3$  d.  $pO_2 = 104$  and  $pCO_2 = 40$
- **9.** Identify the wrong statement with reference to transport of oxygen. (2020)
  - a. Partial pressure of CO<sub>2</sub> can interfere with O<sub>2</sub> binding with haemoglobin.
  - b. Higher H<sup>+</sup> conc. in alveoli favours the formation of oxyhaemoglobin.
  - c. Low pCO<sub>2</sub> in alveoli favours the formation of oxyhaemoglobin.
  - d. Binding of oxygen with haemoglobin is mainly related to partial pressure of O<sub>2</sub>.



- **10.** The partial pressure of oxygen in the alveoli of the lungs is: (2016 II)
  - a. Less than that in the blood
  - b. Less than that of carbon dioxide
  - c. Equal to that in the blood
  - d. More than that in the blood

11. Reduction in pH of blood will:

(2016 - I)

- a. Reduce the rate of heart beat
- b. Reduce the blood supply to the brain
- c. Decrease the affinity of hemoglobin with oxygen
- d. Release bicarbonate ions by the liver
- **12.** When you hold your breath, which of the following gas changes in blood would first lead to the urge to breathe? (2015 Re)
  - a. Rising CO<sub>2</sub> concentration
  - b. Rising CO, and falling O, concentration
  - c. Falling O2 concentration
  - d. Falling CO, concentration
- **13.** Approximately seventy percent of carbon-dioxide absorbed by the blood will be transported to the lungs: (2014)
  - a. As carbamino-haemoglobin
  - b. As bicarbonate ions
  - c. In the form of dissolved gas molecules
  - d. By binding to R.B.C.

# Regulation & Disorders of Respiratory System

**14.** Match the following columns and select the correct option: (2020-Covid)

		Colun	nn-I		Column-II			
1.	Pneu	motaxio	Centre		(i)	Alveoli		
2.	O <sub>2</sub> Di	issociat	ion curv	/e	(ii)	Pons region of brain		
3.	Carbo	onic An	hydrase	;	(iii)	Haemoglobin		
4.	Prima of gas		of exch	ange	(iv)	R.B.C.		
(	(1)	(2)	(3)	(4)				
a. (	(ii)	(iii)	(iv)	(i)				

c. (iv) (i) (iii) (ii) d. (i) (iii) (ii) (iv)

(iv)

(i)

(ii)

b. (iii)

- **15.** Due to increasing air-borne allergens and pollutants, many people in urban areas are suffering from respiratory disorder causing wheezing due to (2019)
  - a. Benign growth on mucous lining of nasal cavity
  - b. Inflammation of bronchi and bronchioles
  - Proliferation of fibrous tissues and damage of the alveolar walls
  - d. Reduction in the secretion of surfactants by pneumocytes.
- **16.** Which of the following options correctly represents the lung conditions in asthma and emphysema, respectively? (2018)
  - a. Inflammation of bronchioles; Decreased respiratory surface
  - b. Increased number of bronchioles; Increased respiratory surface
  - c. Increased respiratory surface; Inflammation of bronchioles
  - d. Decreased respiratory surface; Inflammation of bronchioles
- **17.** Which of the following is an occupational respiratory disorder? (2018)
  - a. Anthracis
  - b. Silicosis
  - c. Botulism
  - d. Emphysema
- **18.** Asthma may be attributed to: (2016 I)
  - a. Bacterial infection of the lungs
  - b. Allergic reaction of the mast cells in the lungs
  - c. Inflammation of the trachea
  - d. Accumulation of fluid in the lungs
- **19.** Name the chronic respiratory disorder caused mainly by cigarette smoking: (2016 1)
  - a. Emphysema
  - b. Asthma
  - c. Respiratory acidosis
  - d. Respiratory alkalosis
- **20.** Name the pulmonary disease in which alveolar surface area involved in gas exchange is drastically reduced due to damage in the alveolar walls. (2015 Re)
  - a. Emphysema
- b. Pneumonia
- c. Asthma
- d. Pleurisy

### **Answer Key**

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
d	d	c	a	b	a	d	d	b	d	c	a	b	a	b	a	b
18	19	20														
b	a	a														