



Respiration

Q1: Regarding bronchial asthma:

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| a) Lung compliance is decreased. | b) Airway resistance is decreased. |
| c) Alveolar ventilation is increased. | d) Work of breathing is increased. |
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Q2: Transpulmonary (transmural) pressure:

- a) Is the pressure difference between alveoli and atmosphere.
 - b) Is increased during inspiration.
 - c) Is decreased when intra-pleural pressure becomes more negative.
 - d) None of the above.
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Q3: Lung compliance:

- a) It is the change in pressure per unit change in volume.
 - b) Decreases when surfactant decreases.
 - c) Increases when surface tension increases.
 - d) Is increased in lung fibrosis.
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Q4: Apnea is caused by the following conditions EXCEPT:

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| a) Voluntary effort. | b) Apnea after hyperventilation. |
| c) During swallowing (pharyngeal stage). | d) Decreased arterial PO ₂ . |
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Q5: The displacement of CO₂ from the blood to alveoli is facilitated by:

- a) Decreased surface area of respiratory membrane.
 - b) Binding of O₂ with Hb in the lungs.
 - c) Increased thickness of respiratory membrane.
 - d) All of the above.
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Q6: Hypercapnea:

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|---------------------------------------|--------------------------------|
| a) Stimulates central chemoreceptors. | b) Decreases respiratory rate. |
| c) Inhibits respiratory center. | d) a and c are correct. |
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Q7: Presence of carbon monoxide in the blood:

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| a) Stimulates respiration. | b) It binds only with reduced Hb. |
| c) It decreases arterial PO ₂ . | d) None of the above is correct. |
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Q8: Valvular (tension) pneumothorax:

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| a) Is defined by presence of fluid in pleural sac. | b) Intra-pleural pressure is positive. |
| c) Increases pulmonary ventilation. | d) None of the above is correct. |
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Q9: Regarding dead space:

- a) It includes the air in the air conducting passages.
 - b) It is measured by nitrogen.
 - c) It causes difference in composition between alveolar air and expired air.
 - d) All of the above.
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Q10: Surfactant:

- a) It increases work of breathing.
 - b) Causes collapse of alveoli during expiration.
 - c) Increases the compliance of the lung.
 - d) Prevents lung expansion during inspiration.
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Q11: Regarding cough reflex:

- a) Is produced mainly by stimulation of mechanoreceptors in the bronchial wall.
 - b) Afferent nerve fibers pass via vagus nerve.
 - c) Cough begins with forced expiration followed by deep inspiration with closed glottis.
 - d) Cough begins with forced expiration followed by deep inspiration with opened glottis.
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Q12: Recoil tendency of the lungs:

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| a) Is only present in abnormal lungs. | b) Is prevented by surface tension. |
| c) Is prevented by negative intra-pleural pressure. | d) Is increased by surfactant. |
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Q13: Intra-pleural pressure:

- a) Is equal to -3 mmHg at end of normal inspiration.
 - b) Is equal to - 6 mmHg at end of normal expiration.
 - c) Becomes positive in Valsalva's experiment.
 - d) Becomes positive in Muller's experiment.
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Q14: Intra-alveolar pressure:

- a) Is negative during normal expiration.
 - b) Is positive during normal inspiration.
 - c) Is negative during deep inspiration with closed glottis.
 - d) a and b are correct.
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Q15: Surfactant:

- a) Is secreted by type II alveolar endothelial cells.
 - b) Increases the compliance of the lungs.
 - c) Increases work of breathing.
 - d) Prevents inflations of the lungs after birth.
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Q16: Airway resistance:

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| a) Is increased by sympathetic stimulation. | b) Does not affect work of breathing. |
| c) Is controlled by the radius of airway. | d) None of the above is correct. |
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Q17: Regarding dead space:

- a) Anatomical dead space is slightly more than physiological dead space.
 - b) Physiological dead space is increased during respiratory diseases that affect the functions of alveoli.
 - c) Dead space causes less O₂ tension (PO₂) in the expired air compared to alveolar air.
 - d) None of the above.
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Q18: Which of the following conditions increases the delivery of oxygen to tissues:

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| a) Decreased PCO ₂ . | b) Increased H ⁺ concentration. |
| c) Decreased temperature. | d) All of the above. |
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Q19: Oxygenation of venous blood at the lungs increases O_2 tension of the blood (PO_2).

This increase in PO_2 :

- a) Stimulates respiratory center and leads to hyperventilation.
 - b) Decreases the saturation of Hb.
 - c) Affects the carbon dioxide dissociation curve.
 - d) None of the above.
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Q20: Bohr's effect is the effect of:

- a) CO_2 on the affinity of hemoglobin to O_2 .
 - b) O_2 on the affinity of hemoglobin to CO_2 .
 - c) 2,3 D.P.G on the affinity of hemoglobin to O_2 .
 - d) Increased saturation of hemoglobin with O_2 .
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Q21: Chloride shift (Hamburger) phenomenon:

- a) It occurs when oxygen enters the blood from alveoli.
 - b) It decreases osmotic pressure inside RBCs.
 - c) It increases the hematocrite value of venous blood.
 - d) None of the above is correct.
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Q22: Central chemoreceptors respond mainly to:

- a) Hypoxemia.
 - b) Respiratory alkalosis.
 - c) Hyperventilation.
 - d) Hypercapnea.
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Q23: Concerning nervous mechanism that control respiration:

- a) Apneusis is a normal pattern of respiration.
 - b) Stimulation of (J) receptors produces hiccup reflex.
 - c) Vomiting affects respiration and leads to apnea.
 - d) a and c are correct.
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Q24: Which of the following is a characteristic feature of hypoxic hypoxia:

- a) PO_2 in the arterial blood is reduced.
 - b) Oxygen carrying capacity of blood is reduced.
 - c) Utilization of oxygen by tissue is reduced.
 - d) Blood flow to the tissue is reduced.
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Q25: Concerning respiration during normal and resting conditions:

- a) Expiration is produced by contraction of expiratory muscles.
 - b) Alveolar pressure is less than atmospheric pressure.
 - c) Intra-pleural pressure gradually decreases (becomes more negative) during expiration.
 - d) None of the above.
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Q26: Regarding inspiration during normal resting conditions:

- a) Occurs when the diaphragm relaxes.
 - b) Alveolar pressure is less negative than intrapleural pressure.
 - c) It decreases the anatomical dead space.
 - d) It's caused by depression of chest cage.
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Q27: The major muscle of respiration is:

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| a) Abdominal muscles. | b) Diaphragm. |
| c) External intercostals muscle. | d) Internal intercostals muscle. |
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Q28: Concerning the mechanics of respiration:

- a) Inspiration is normally passive process.
 - b) Expiratory muscles act during rest.
 - c) Lungs expand by increased negativity of intrapleural pressure.
 - d) Expiration is normally active process.
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Q29: Which of the following is true during inspiration:

- a) Intrapleural pressure is positive.
 - b) Alveolar pressure equals atmospheric pressure.
 - c) Alveolar pressure is positive.
 - d) Intrapleural pressure becomes more negative.
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Q30: Which of the following is wrong:

- a) Surfactant helps lung expansion.
 - b) Low surface tension in the alveoli decreases the compliance.
 - c) Surfactant decreases work of breathing.
 - d) Work of breathing is increased in obstructive lung diseases.
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Q31: Which of the following represents the pressure difference that acts to distend lungs:

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| a) Alveolar pressure. | b) Airway opening pressure. |
| c) Transthoracic pressure. | d) Transpulmonary pressure. |
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Q32: Lung compliance is decreased in all the following conditions EXCEPT:

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| a) Premature baby. | b) Emphysema. | c) Lung fibrosis. | d) Pulmonary edema. |
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Q33: Hypocapnea:

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| a) Increases respiratory rate. | b) Stimulates central chemoreceptors. |
| c) Inhibits respiratory center. | d) a and c are correct. |
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Q34: Carbon monoxide is toxic because:

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| a) It causes hypoxic hypoxia. | b) It does not bind with ferrous of the Hb. |
| c) At decreases arterial PO ₂ . | d) None of the above is correct. |
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Q35: All of the following exerts non chemical (neural) influence on respiration EXCEPT:

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| a) J receptors. | b) Acidosis of arterial blood. |
| c) Sneezing reflex. | d) Proprioceptors. |
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Q36: Which of the following is correct:

- a) Central chemoreceptors are located in the cerebral cortex.
 - b) Central chemoreceptors are stimulated mainly by hypoxia.
 - c) Voluntary control of breathing is located in the pons and medulla.
 - d) Autonomic (Involuntary) control of breathing is located in the pons and medulla.
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Q37: Which of the following is the primary regulating factor of central the chemoreceptors:

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| a) Arterial PO ₂ . | b) Arterial PCO ₂ . |
| c) Arterial concentration of H ⁺ . | d) Hemoglobin content. |
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Q38: Alveolar surfactant acts to increase pulmonary:

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| a) Surface tension. | b) Compliance. | c) Airways resistance. | d) Blood flow. |
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Q39: During normal respiration (inspiration & expiration) the intrapleural pressure:

- a) Is higher than the atmospheric pressure.
 - b) Is always lower than the alveolar pressure.
 - c) Is always negative.
 - d) b and c are correct.
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Q40: Regarding dead space:

- a) Physiological dead space can be measures by the nitrogen meter method.
 - b) Anatomical dead space can be measured by using the Bohr's equation.
 - c) It reduces alveolar ventilation in shallow rapid breathing.
 - d) It causes an increase in PCO_2 in expired air relative to alveolar PCO_2 .
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Q41: Very low level of oxygen in the inspired air is expected to:

- a) Stimulates the respiratory center via central chemoreceptors.
 - b) Increases the pulmonary ventilation.
 - c) Causes hypoxemia that inhibits aortic chemoreceptors.
 - d) All of the above.
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Q42: As blood passes through systemic capillaries, what happens to the affinity of Hb for oxygen and what happens to the Hb- O_2 dissociation curve:

- a) Hb affinity for O_2 increases and the dissociation curve shifts to the left.
 - b) Hb affinity for O_2 increases and the dissociation curve shifts to the right.
 - c) Hb affinity for O_2 decreases and the dissociation curve shifts to the left.
 - d) Hb affinity for O_2 decreases and the dissociation curve shifts to the right.
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Q43: A stroke that destroyed the respiratory center of medulla would be expected to lead to:

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| a) Immediate stop of breathing. | b) Apneustic breathing. |
| c) Rapid breathing (hyperpnea). | d) None of the above. |
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Q44: Cyanosis indicates a higher than normal blood concentration of:

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| a) Carbon dioxide. | b) Carbon monoxide. |
| c) Diphosphoglycerate (DPG). | d) Reduced hemoglobin. |
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Q45: Carbon dioxide carried in blood mainly:

- a) As carbaminohemoglobin in the red blood cells.
 - b) As the bicarbonate ion in the plasma after first entering the red blood cells.
 - c) As carbonic acid in the plasma.
 - d) In a dissolved form.
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Q46: If the barometric pressure (of dry air) is 600 mmHg and the percentage of oxygen is 20%, the partial pressure of oxygen is:

- a) 20 mmHg.
 - b) 120 mmHg.
 - c) 30 mmHg.
 - d) 300 mmHg.
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Q47: Concerning the lung compliance:

- a) $C = \Delta P / \Delta V$.
 - b) It increases when surface tension increase.
 - c) It increases in fibrosis.
 - d) It decreases when surfactant decrease.
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Q48: Concerning O₂ transport, the oxygen capacity of the blood is determined by:

- a) Amount of O₂ dissolved in the blood.
 - b) Affinity of Hb for oxygen.
 - c) Amount of Hb in the blood.
 - d) All of the above are correct.
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Q49: Physiological dead space:

- a) Normally is equal to the anatomical dead space.
 - b) Is smaller than the anatomical dead space.
 - c) Can be greater than anatomical dead space.
 - d) a and c are correct.
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Q50: Sever decrease in blood flow to the tissue may cause:

- a) Anemic hypoxia.
 - b) Stagnant hypoxia.
 - c) Hypoxic hypoxia.
 - d) Histotoxic hypoxia.
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Q51: The normal value for dead space volume of an adult person is about:

- a) 150 / L.
 - b) 150 ml.
 - c) 150 ml/min.
 - d) 150 ml %.
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Q52: The peripheral chemoreceptors respond mainly to:

- a) Hypoxia.
 - b) Alkalosis.
 - c) Acidosis.
 - d) Hypercapnea.
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Q53: Arterial PCO₂ is increased in a normal individual while:

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| a) Descending a mountain. | b) Hyperventilating. |
| c) Hypoventilating. | d) Breathing a gas mixture with high O ₂ . |
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Q54: Oxygen is transported in the blood mainly as:

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| a) Bicarbonate. | b) Carboxyhemoglobin. |
| c) Carbaminohemoglobin. | d) Oxyhemoglobin. |
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Q55: Expired gas when compared with atmospheric air has:

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| a) Less O ₂ . | b) Less CO ₂ . | c) Less water vapor. | d) More nitrogen. |
|--------------------------|---------------------------|----------------------|-------------------|
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Q56: The normal oxygen content of arterial blood is:

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| a) 14 ml / mg. | b) 19 ml %. | c) 19 mg / ml. | d) 19 mg %. |
|----------------|-------------|----------------|-------------|
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Q57: Concerning lung compliance:

- a) Its normal value is 200 ml / mmHg.
 - b) It is not affected by the surface tension.
 - c) It decreases in lung fibrosis.
 - d) $C = \Delta P / \Delta V$.
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Q58: Voluntary type of respiration originates from:

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|----------------|-------------|-----------|---------------------|
| a) Cerebellum. | b) Medulla. | c) Lungs. | d) Cerebral Cortex. |
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Q59: If the tidal volume is 400ml, respiratory rate is 10 / min, and dead space volume is 100 ml, the pulmonary ventilation is:

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|-------------------|-------------------|-------------------|-------------------|
| a) 3000 ml / min. | b) 4000 ml / min. | c) 5000 ml / min. | d) 6000 ml / min. |
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The Answers key

<i>Question</i>	<i>Answer</i>	<i>Question</i>	<i>Answer</i>	<i>Question</i>	<i>Answer</i>
<i>1</i>	<i>d</i>	<i>21</i>	<i>c</i>	<i>41</i>	<i>b</i>
<i>2</i>	<i>b</i>	<i>22</i>	<i>d</i>	<i>42</i>	<i>d</i>
<i>3</i>	<i>b</i>	<i>23</i>	<i>c</i>	<i>43</i>	<i>a</i>
<i>4</i>	<i>d</i>	<i>24</i>	<i>a</i>	<i>44</i>	<i>d</i>
<i>5</i>	<i>b</i>	<i>25</i>	<i>d</i>	<i>45</i>	<i>a</i>
<i>6</i>	<i>a</i>	<i>26</i>	<i>b</i>	<i>46</i>	<i>b</i>
<i>7</i>	<i>d</i>	<i>27</i>	<i>b</i>	<i>47</i>	<i>d</i>
<i>8</i>	<i>b</i>	<i>28</i>	<i>c</i>	<i>48</i>	<i>c</i>
<i>9</i>	<i>d</i>	<i>29</i>	<i>d</i>	<i>49</i>	<i>d</i>
<i>10</i>	<i>c</i>	<i>30</i>	<i>b</i>	<i>50</i>	<i>b</i>
<i>11</i>	<i>b</i>	<i>31</i>	<i>d</i>	<i>51</i>	<i>b</i>
<i>12</i>	<i>c</i>	<i>32</i>	<i>b</i>	<i>52</i>	<i>a</i>
<i>13</i>	<i>c</i>	<i>33</i>	<i>c</i>	<i>53</i>	<i>c</i>
<i>14</i>	<i>c</i>	<i>34</i>	<i>d</i>	<i>54</i>	<i>d</i>
<i>15</i>	<i>b</i>	<i>35</i>	<i>b</i>	<i>55</i>	<i>a</i>
<i>16</i>	<i>c</i>	<i>36</i>	<i>d</i>	<i>56</i>	<i>b</i>
<i>17</i>	<i>b</i>	<i>37</i>	<i>b</i>	<i>57</i>	<i>c</i>
<i>18</i>	<i>b</i>	<i>38</i>	<i>b</i>	<i>58</i>	<i>d</i>
<i>19</i>	<i>c</i>	<i>39</i>	<i>d</i>	<i>59</i>	<i>b</i>
<i>20</i>	<i>a</i>	<i>40</i>	<i>c</i>		

With my Best Wishes

Dr. Ahmad Alarabi

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