Class Activity #9 Physiology

The Respiratory System

Review the Lectures and Worksheet content for the Respiratory System.
*Read and use your textbook, lecture notes, slides or internet to **select** best answers. Online labs, Pre-Lab Lung Disorders Assignment will all be useful for review of Study Guide #3 content.*

Breathing Air and the Respiratory System

1. If breathing in air, the respiratory system starts at the _____ and immediately enters the _____ cavity. This is an important site for the _____ of inspired air, which happens in 3 main ways: **1)** _____, **2)** _____ and **3)** _____.

2. The wind pipe is called the _____ and it splits into the L and R _____.

3. The R lung has ___ lobes and the L lung has ___ lobes, both are located in the _____.

4. The lung structure that are for gas exchange are the _____. There are about _____ million of these in each lung. These structures are composed of 3 different types of cells, they are: **1)** _____, **2)** _____ and **3)** _____.

5. When the diaphragm contracts, the muscle moves _____. This movement changes the _____ in the thoracic cavity, making it _____. As a consequence, the pressure in the thoracic cavity goes _____, and air then moves down its pressure gradient, meaning air moves _____ the lung, which is called _____.

6. When the *external intercostal* muscles contract, this causes a(n) _____ in the volume of the thoracic cavity. This then causes a(n) _____ in the _____ of this cavity. This leads to air flowing down its pressure gradient, _____ the lungs.

7. When the *internal intercostal* muscles contract, this causes a(n) _____ in the volume of the thoracic cavity. This then causes a(n) _____ in the _____ of this cavity. This leads to air flowing down its pressure gradient, _____ the lungs.

Gas Exchange

8. Gases move from areas of _____ to areas of _____.

9. If an individual gas moves from one region to another, what has to be present? _____.

10. If a liquid is exposed to a P_{CO2} of 100 mmHg and a P_{O2} of 100 mmHg, then equal amounts of oxygen and carbon dioxide will dissolve in the liquid. **True** or **false**? _____.

Briefly explain why this is true or not: _____.

11. The more soluble a gas is, the (greater/less?) the partial pressure needed to force the gas into solution. Gases move between liquid and gaseous phases until _____is reached. Which gas is more soluble in body fluids: O_2 or CO_2? _____. Descending into a valley, the atmospheric pressure increases to **880 mmHg**. Calculate the partial pressure of O_2 in the air, given that N_2 and O_2 are the only components of air. Answer = _____.

12. The roles of **Hb** are to transport _____ and _____. Specifically, Hb is found in _____. When looking at the **Hemoglobin-O_2 Saturation Curve**, the affinity that Hb has for O_2 can be altered (i.e., the curve can be shifted) by 4 factors. Name them and in general how they shift the **Hb-O_2** curve.

1) _____:

2) _____:

3) _____:

4) _____:

13. The type of cells lining most of the respiratory tract is _____, which is called _____. This lining of the respiratory tract changes at specific regions, such as at the _____, where it turns into _____ for exchange. With regard to the airways, the terminal bronchioles are (larger/smaller?) than the respiratory bronchioles?

14. Define **atmospheric**, **alveolar**, and **intra-pleural** pressure. Explain why the intra-pleural pressure must always be both *sub*-atmospheric and *sub*-alveolar (i.e., always lower pressure than the other two). If the pleural membrane were punctured, what would happen (use clinical terms) and why?

15. Below are clues to the **perfect conditions** for optimal exchange between the pulmonary capillaries and the alveoli. Complete them and list specific disease states that exhibit problems with these conditions.

1) _____ surface -

2) _____ epithelial layer -

3) _____ surface area -

4) _____extracellular fluid -