Circulation/Respiration Questions

To answer these questions, use your note packet, and **read the chapter on Circulation and Respiration** in your textbook. Only concentrate on circulation and respiration in the **human** body (*you may omit any special information on other organisms*). Do a good job answering these questions; they will help you with your in–class test. Be sure to write down any questions you may have about the material, so that you can ask them in class.

Circulation

1. Trace a drop of blood—starting from your toe, traveling through your heart and lungs, and back to the toe. Include all valves, vessels, heart chambers, and lungs.

2. What is meant by "double circulation"?

3. List 3 components of blood plasma; also mention their function.

4. List 3 types of blood cells, their origin, and their function.

5. How do veins differ from arteries in their structure and function? How are they similar?
   Considering the function of these two vessels, why do the structural differences exist?

6. Explain the cellular structure of a capillary, and relate its structure to its function.

7. Explain the importance of capillary sphincters. Include the location of the sphincters and how they function.
   Why might you get indigestion if you exercise immediately after eating?

9. Explain what happens to blood pressure and blood flow velocity as blood passes from arteries to capillaries to veins.
   Include why the pressure and velocity changes in these vessels.

10. What is the coronary circulation?
    Explain how the coronary circulation is involved in heart attacks. What do you think would determine the severity of the heart attack? Explain.

11. What is the hepatic portal system, and what is its purpose? Include the hepatic portal vein and the hepatic vein in your discussion. What blood vessel brings oxygenated blood to the liver?

12. What is the lymphatic system?
    What is lymphatic fluid and by what mechanism does it circulate throughout the body? In addition to its major role in the immune system, how is it related to the collection of plasma from the blood circulatory system?

13. Summarize the clotting process: include the role of platelets, clotting factors, thrombin, fibrin, and all other important substances mentioned in the note packet.

14. What is systolic and diastolic blood pressure? What are your heart chambers and valves doing during the systolic and diastolic pressure readings? For example, are the chambers filling, emptying, relaxing, contracting, etc.?

    What is peripheral resistance and what is it's role in maintaining blood pressure when the heart is relaxing?

    Explain how smooth muscle relates to the control of blood pressure.

15. Explain how the heartbeat is initiated, and propagated through the heart. Include all structures.

16. How are nerves and hormones related to regulation of the heartbeat and blood pressure?

Respiration

1. Trace the passage of a molecule of oxygen from the air to the body cells.

2. What are 3 basic characteristics required of a gas exchange structure? Explain why these characteristics are important.

4. What is the function of each of the following: nose hairs, mucus, and cilia?

6. Explain how oxygen and carbon dioxide are transported in blood.

8. Summarize the movements of the rib cage, diaphragm, and lungs in inspiration and expiration. What actually causes the lungs to fill and to empty?

7. What is the role of CO_2 and the the medulla in the regulation of breathing?

   Why do some people pass out when they hyperventilate?

8. Explain how the carbonic acid/bicarbonate ion blood buffer system regulates blood pH.

9. Explain how and why the PO2 and PCO2 changes from the air, into the lungs, and then through the body.*(Explain the diagram on page 17 of the notes)*

You will answer the following question after it is discussed in class:

9. Why does the amount of O2 that dissociates from Hb change depending on whether the cells of the body are undergoing normal metabolism or if the cells are very metabolically active? Include the changes that occur in the hemoglobin molecule as oxygen is loaded and unloaded.

   How does pH affect the dissociation of oxygen from hemoglobin?