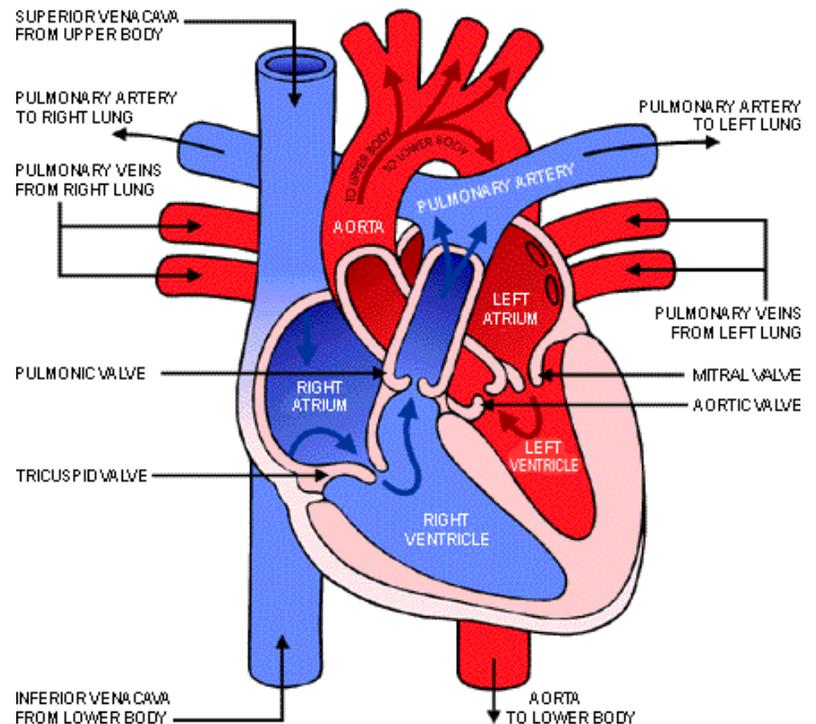
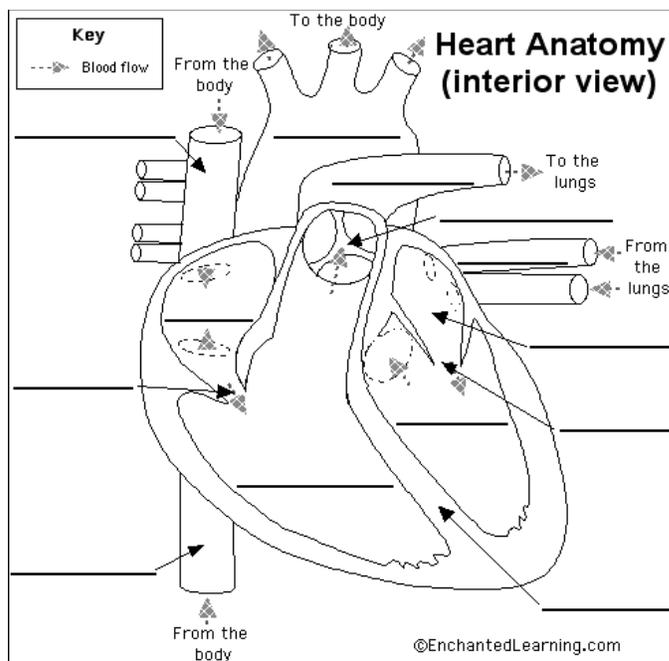


SBI 3U: ANIMAL ANATOMY - REVIEW QUESTIONS: ANSWERS

1. Choose the main functions of the circulatory system? (Note: you may have more than 1 answer)
 - a. to transport nutrients
 - b. to allow gas exchange
 - c. to remove wastes
 - d. to filter blood
2. Deoxygenated blood returns from the legs to the heart via the:
 - a. inferior vena cava
 - b. superior vena cava
 - c. pulmonary vein
 - d. coronary artery
3. A heart attack will result from the lack of nutrients and oxygen to the heart muscle itself due to blockage of the:
 - a. pulmonary arteries
 - b. coronary arteries
 - c. pulmonary veins
 - d. coronary veins
4. The blood vessel that has the highest blood pressure:
 - a. pulmonary artery
 - b. brachial artery
 - c. radial artery
 - d. aorta
5. The process by which gases move from the alveoli into the capillaries:
 - a. active transport
 - b. osmosis
 - c. diffusion
 - d. filtration
6. Respiratory rate is affected by:
 - a. levels of oxygen in the blood
 - b. levels of nitrogen in the blood
 - c. levels of carbon dioxide in the blood
 - d. none of the above are correct
7. When you breath in the air is _____ to your lungs
 - a. Sucked in
 - b. Forced in
 - c. Pulled in
 - d. Forced out
8. **Fifty-five percent** of human blood is comprised of ...
 - a. white blood cells
 - b. leukocytes
 - c. red blood cells
 - d. platelets
9. **Normal** blood pressure is ...
 - a. 180/110
 - b. 120/80
 - c. 80/120
 - d. 100/120
10. Red blood cells carry

- a. CO₂
 - b. O₂
 - c. Glucose
 - d. Foot massage lotion
11. Capillaries are efficient at gas exchange because:
- a. they have thin walls
 - b. blood flows slowly through them
 - c. only one red blood cell flows through them at a time
 - d. all the above statements are correct
 - e. two of the above statements are correct
12. Systole refers to:
- a. heart relaxation
 - b. blood pressure exerted by the right ventricle
 - c. heart contraction
 - d. blood pressure exerted by the left ventricle
13. The amount of blood pumped by the left ventricle per contraction is called:
- a. stroke volume
 - b. cardiac output
 - c. heart rate
 - d. vital capacity
14. Tidal volume is:
- a. the total volume of gas that can be moved in or out of the lungs
 - b. the amount of gas that remains in the respiratory system after full exhalation
 - c. the additional volume of air that can be forced out of the lungs
 - d. the volume of air inhaled and exhaled in a normal breathing movement
15. When Bob sees Susan his blood pressure goes above normal. What value would this be?
- a. 120/80
 - b. 100/60
 - c. 140/95
 - d. 0/0
16. How does the ribcage move during inhalation?
- a. up and out as the diaphragm moves down
 - b. down and in as the diaphragm moves down
 - c. down and in as the diaphragm moves upward
 - d. up and out as the diaphragm moves upwards
17. What is the maximum volume of air that can be moved into and out of the lungs in a single breath?
- a. inspiratory reserve volume
 - b. tidal volume
 - c. vital capacity
 - d. residual volume
18. In which structure does gas exchange happen?
- a. bronchioles
 - b. alveoli
 - c. bronchi
 - d. diaphragm
1. Arteries have elastic/thick muscular walls to withstand high pressure coming from the heart pumping.

2. Veins have **thin** walls and one-way **valves** to help blood **flow** to the heart.
3. Capillaries have the **smallest** diameter of all the blood vessels but the **largest** surface area due to their extensive branching. They are the site of **gas exchange**.
4. The electrical activity starts at the **SA (sinoatrio)** node and spreads to the **right** atrium, through Bachman's bundle to the **left** atrium stimulating the **atria (both atriums)** to contract. Electricity then travels to the **AV (atrioventricular)** node where it is delayed **0.1s**. This delay is critical otherwise the **atria** and **ventricles** would contract at the same time and blood would not flow properly. The distal portion of the **AV** node is known as the Bundle of **His**. It splits into **two** branches. The bundle branches activate the **Purkinji** fibers in the **ventricle** and **cause the** ventricle to contract.
5. Heart rate is expressed as **beats per minute** and can be taken from your **ulnar/ brachial** artery in your wrist or your **carotid** artery in your neck.
6. Label the following parts of the heart and trace the pathway of blood



1. Trace the pathway of a breath of air from its point of entry to its diffusion in the lungs. Refer to structures that the breath passes by or through. [4]

Pathway of air for inhalation:

- Nasal passage or oral cavity
- Pharynx
- Epiglottis
- Larynx
- Trachea
- Bronchi
- Bronchioles
- Alveoli
- Capillaries (on the outside of the alveoli)
- Gas exchange occurs (CO₂ out and O₂ in)

2. List and explain the function of all the components of human blood. [4]

Blood plasma - 55%

- 91% water
- 3% antibodies & proteins, nutrients and wastes

Blood solids - 45%

- 99.9% Red blood cells (RBC)
- White blood cells (WBC)
- Platelets
- WBC & Platelets combined make up just 0.1%

3. How do arteries differ from veins? List 4 differentiating characteristics. [4]

Arteries	Veins
No valves	1 way valves to prevent backflow of blood
Strong, thick, elastic walls to withstand high blood pressure	Thin walls (veins have low blood pressure), larger diameter
Contain 30% of blood volume	Contain 70% of blood volume
Carry blood away from heart	Carry blood towards the heart
Most of the time carry oxygenated blood (exception is the pulmonary artery)	Most of the time carry deoxygenated blood (high CO ₂) (exception is the pulmonary vein)

4. What are names the structures of the heart that pump blood where do they send the blood. [2]

What part does the pumping?	Where does the blood get pumped to?
Right atrium	Right ventricle (through AV valve)
Right ventricle	Pulmonary artery - to the lungs (through tricuspid/ pulmonary semilunar valve)
Left atrium	Left ventricle (through the AV valve)
Left ventricle	Ascending and descending aorta (to the body)

5. Nicotine inhaled with cigarette smoke causes blood vessels to narrow. What problems would this cause in the human body? [2]

- Restricted blood flow in blood vessels
- This means less oxygen getting to tissues and less CO₂ being removed
- Person would feel lethargic and less able to perform physical activity

6. Explain what vital capacity, and tidal volume are. [2]

Vital capacity - The maximum volume of that can be exhaled after the maximum inhalation.

Tidal volume - The normal volume of air inhaled and exhaled in a single breath.

7. What is the difference between systole and diastole?

Systole - the part of the cardiac cycle where the heart is contracting

Diastole - the part of the cardiac cycle where the heart is refilling (relaxing)

8. Where is blood pressure the highest? Where is it the lowest? Why?

- Highest blood pressure would be when it is just leaving the heart through the aorta, as it has to be pumped forcefully enough to be transported to all the body tissues.
- Lowest pressure would be in the capillaries all over the bodies because they are the smallest

blood vessels and cannot withstand high pressures.

9. Complete the following table:

Enzyme or secretion	Secreted/ Produced By	Present and Active In	Nutrient acted upon (if applicable)
Pepsin	Stomach	Stomach Only active at low pH	Protein
Bile	Liver	Stored in gallbladder Active in small intestine	fats
Amylase	Salivary Glands	Mouth/Saliva	Starch
HCl	stomach	stomach	provides the proper pH for pepsin
Carbohydrase	pancreas	Small Intestine	carbohydrates
Lipase			fats
Protease			Proteins

10. Explain the pathway of food from your mouth to anus.

Pathway of food through digestive system:

- Mouth (chewing with teeth)
- Pharynx
- Esophagus
- Cardiac sphincter
- Stomach
- Pyloric sphincter
- Small intestine
 - Duodenum
 - Jejunum
 - Ilium
- large intestine/colon
- rectum
- anus

11, what is the difference between chemical and mechanical digestion?

Chemical digestion - the use of enzymes and secretions of the digestive system to chemically break down food so the nutrients can be absorbed into the bloodstream

Mechanical/physical digestion - physically breaks down food into smaller particles e.g./ teeth chewing, stomach churning food

12. The epiglottis prevents food from travelling down the trachea.

13. The muscular contractions that move food down the epiglottis are called peristalsis.

14. The 3 parts of the small intestine are the: duodenum, jejunum, and ileum.

15. Explain why the villi is so important to the absorption of nutrients. They increase the surface area of the small intestine so there is more area for nutrients to get absorbed.

16. The role of the large intestine/colon is to absorb mostly water.

17. The accessory organs of the digestive system are the: liver, gallbladder and pancreas.

18. The liver produces bile, the gallbladder stores and releases bile, the pancreas releases sodium bicarbonate to neutralize the acidic stomach acid. The pancreas also secretes 3 digestive

enzymes: lipase, proteases and carbohydrases. Most importantly, the pancreas secretes insulin to regulate blood sugar.