

Extra Credit Critical Thinking Questions (Biol 2404: Intro to A & P)

Most of the following questions are designed to go a little beyond the specific knowledge you are actually accountable for in this class. You may have to search for additional information to answer some of them. There are textbooks in the library or a number of resources on the web that you can use to find answers to questions not discussed in your text. A few will require only a sentence or two, most will require some elaboration and explanation. Please use the actual number given for each question, you do not need to write out the question you are answering. The correct answer to each question is worth one point. Any points you receive from answering these questions will contribute toward your total EC points possible. Extra Credit answers are due on the test date covering those topics, they will not be accepted after that. Copying answers from a classmate will get both of you an "F" in the course.

The Human Body, an Orientation

1. When we begin to become dehydrated, we usually become thirsty, which causes us to drink fluids. On the basis of what you now know about control systems, decide whether the thirst sensation is part of a negative or a positive feedback control system and defend your choice.
5. Explain why models are useful in understanding the basic principals of anatomy and physiology.

Basic Chemistry & Biochemistry

2. Evelyn is quite proud of her slender, model-like figure and boasts that she doesn't have an "ounce of excess body fat." Barbara, on the other hand, is grossly overweight. She complains of being "hot" most of the time, and on a hot day she is miserable. Evelyn generally feels chilled except on very hot days. Explain the relative sensitivity to environmental temperature of these two women on the basis of information you have been given in the Organic Compounds section of this chapter.
6. An important buffer system in the human body involves carbon dioxide and bicarbonate ions. If a person became excited and exhaled large amounts of carbon dioxide while hyperventilating, how will the pH of their blood be affected and why.

Cells and Tissues

3. Solutions A and B are separated by a selectively permeable membrane. Over time the fluid level inside A increases. Which solution initially had the higher concentration of solute? Which had the higher concentration of water? Explain.
4. Certain antibiotics can damage ribosomes in normal human cells. People taking such medications must be closely monitored. Explain the possible consequences of the loss of a large number of ribosomes in certain tissues or organs.

Skin and Body Membranes

2. A model is concerned about a new scar on her abdomen. She tells her surgeon that there is practically no scar from the appendix operation done when she was 16, but this new gallbladder scar is "gross". Her appendectomy scar is small and obliquely located on the inferior abdominal surface - it is very indistinct. By contrast, the gallbladder scar is large and lumpy and runs at right angles to the central axis of the body trunk. Can you explain why the scars are so different?
3. What does sunlight do to promote bone maintenance and growth?

The Skeletal System

3. A babysitter is on trial for the death of a 10-month old infant. The prosecutor contends that the child died as a result of being violently shaken. The defense claims that the child's head became stuck in the

slats of his crib and, in trying to twist free, the child broke his neck. The medical examiner testifies that the child died as the result of a compression of the spinal cord between the sixth and seventh cervical vertebrae. The superior articular processes of the seventh cervical vertebra and the inferior articular processes of the sixth cervical vertebra were fractured, and the processes on the right side were laterally displaced, causing the sixth vertebra to slide laterally across the seventh, damaging the spinal cord. On the basis of this evidence, whom do you believe, Why?

6. When a person develops Paget's disease, for unknown reasons the collagen fibers in the bone matrix run randomly in all directions. In addition, there is a reduction in the amount of trabecular bone. What symptoms would you expect to observe and why?

The Muscular System

4. Frieda was involved in an automobile accident in which her car was "rear-ended", resulting in a whiplash injury. What neck muscles would be injured in this type of accident and why?
6. Propose an exercise that would benefit each of the following muscles specifically:
 - biceps brachii
 - triceps brachii
 - deltoid
 - pectoralis major
 - rectus abdominis
 - rectus femoris
 - gastrocnemius

The Nervous System

4. What part of the brain is being tested when a police officer asks a DWI suspect to walk a straight line and touch his nose with his finger. Explain.
9. A child eats a whole bottle of salt (NaCl) tablets. What effect would this have on his action potentials?

Special Senses

2. Janie is referred to the eye clinic by her teacher, who suspects a need for glasses. Examination demonstrates that Janie is myopic. Will she need concave or convex lenses? Explain.
7. A fracture of which cranial bone would most likely eliminate the sense of smell? Why?

The Endocrine System

1. Mary Morgan has just been brought into the emergency room of the hospital. She is perspiring.
5. Explain why diabetes is a much more widespread and serious problem than extreme hypoglycemia; (think synergists and antagonists).
23. A patient has hyperparathyroidism and produces excessive amounts of parathyroid hormone. What effect would this hormone have on bones? Would administration of large doses of vitamin D help the situation? Explain.

The Circulatory System

6. Explain, specifically, how liver dysfunction can cause bleeding disorders.
15. People with allergies commonly take antihistamines with decongestants to relieve their symptoms.

The container warns that the medication should not be taken by individuals who are being treated for high blood pressure. Why not, be specific?

The Lymphatic System

1. Compare and contrast the structure of a lymphatic capillary with that of a blood capillary. Explain how their structural differences are related to their functional differences.
2. Explain the symptoms that might arise if lymphatic vessels in the legs become blocked. How might this happen?

The Respiratory System

8. Why do individuals who are anemic generally not exhibit an increase in respiratory rate or tidal volume even though their blood is not carrying enough oxygen?
10. In what ways do the structure and function of the pleurae resemble the structure and function of the pericardium?

The Digestive System

2. A baby is admitted to the hospital with a history of diarrhea and watery feces occurring over the last three days. The baby has sunken fontanelles, indicating extreme dehydration. On examination, the baby is found to have a bacterium-induced colitis, and antibiotics are prescribed. Because of the baby's loss of intestinal juices, do you think that his blood would indicate acidosis or alkalosis? Explain your reasoning.
3. Why, specifically, does a vegetarian usually have to be more careful about his/her diet than a person who eats meat?

The Urinary System

2. In some patients with diabetes mellitus not enough insulin is produced, consequently, blood glucose levels increase. If blood glucose levels rise high enough, the kidneys are unable to reabsorb all the glucose that filters out and glucose "spills over" into the urine. What effect would this have on urine concentration and volume? How would the body attempt to adjust to this?
5. Carlos has advanced arteriosclerosis. An analysis of his blood indicates elevated levels of aldosterone and decreased levels of ADH. Explain.

The Reproductive System

2. Lucy had both her left ovary and her right uterine tube removed surgically at age 17 because of a cyst and a tumor in these organs. Now, at age 32, she remains healthy and is expecting her second child. How could Lucy naturally conceive a child with just one ovary and one uterine tube, widely separated on opposite sides of the pelvis like this?
3. Diane has peritonitis (an inflammation of the peritoneum), which her physician says resulted from a urinary tract infection. Why could this situation occur more readily in females than in males?

Human Development

1. *Oligohydramnios* is an abnormally low volume of amniotic fluid. Renal agenesis is a failure of the fetal kidneys to develop. Which of these do you think is most likely to cause the other? Explain why. What could be some consequences of oligohydramnios to fetal development?

2. Martha is showing a sonogram of her unborn baby to her coworkers. Her friend Betty tells her she shouldn't have sonograms made because X-rays can cause birth defects. Is Betty's concern justified? Explain.