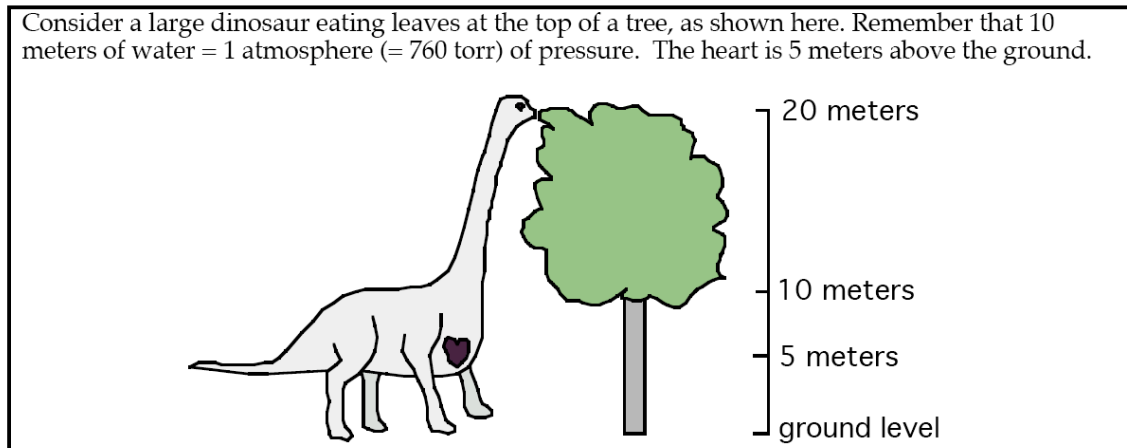


Version A

This test consists of xx questions on xx pages; please make sure you have a complete exam before beginning. Read each question carefully, and choose the single best answer. If you have a question, raise your hand, and I'll try to answer it for you.

Good luck!



1. If the dinosaur has a double circulation, which of the following is most likely to be correct?
  - a. Venous pressure in the animal's head will be higher than venous pressure in the tail.
  - b. If the pressure of arterial blood entering the brain must be at least 100 torr, a single circulation might work better at supplying the brain than a double circulation.
  - c. If the pressure of arterial blood entering the brain must be at least 100 torr, the systolic pressure in the heart's left ventricle should be  $> 1,200$  torr.
  - d. Because systolic pressure in the left ventricle must be high to push blood up the head, blood pressure in the lungs must also be high.
  - e. One would expect to find more fluid loss from brain capillaries than from capillaries in the foot.
  
2. Assuming its nutritional physiology is like that of modern herbivorous mammals, what might you expect to find if you were able to study the dinosaur?
  - a. It obtains amino acids and vitamins from the leaves it eats
  - b. It may not need to obtain any amino acids from protein in its food but it does need a nitrogen source
  - c. It repeatedly chews regurgitated food
  - d. A third to a half of the chemical potential energy in ingested food is lost as feces

- e. All of the above are reasonable expectations
3. Which of the following statements about the transport of oxygen and CO<sub>2</sub> in a mammal is true?
- Both enter and leave the circulatory system by active transport across capillary walls.
  - Breathing rate is normally controlled by blood concentrations of both gases.
  - Both cause substantial changes in pH when they dissolve in blood or tissue fluids.
  - Both require expenditure of ATP for transport within the body
  - Concentrations of both in the veins and pulmonary artery will increase if an animal becomes more active.
4. Suppose you tested two people and one person (Joe) was capable of maximal aerobic metabolic rate twice as high as that of the other person (Bill). Without knowing anything else about Joe and Bill, which of the following do you think is most likely to be true?
- The maximal cardiac output of Joe is much higher than that of Bill.
  - There is more dissolved oxygen in arterial blood in Joe than in Bill.
  - Hemoglobin in arteries in the systemic circulation would be much more saturated with oxygen in Joe than in Bill.
  - Joe could sprint much faster than Bill
  - Joe's body temperature is higher than Bill's, so Joe's metabolic rate is greater because of Q<sub>10</sub> effects.