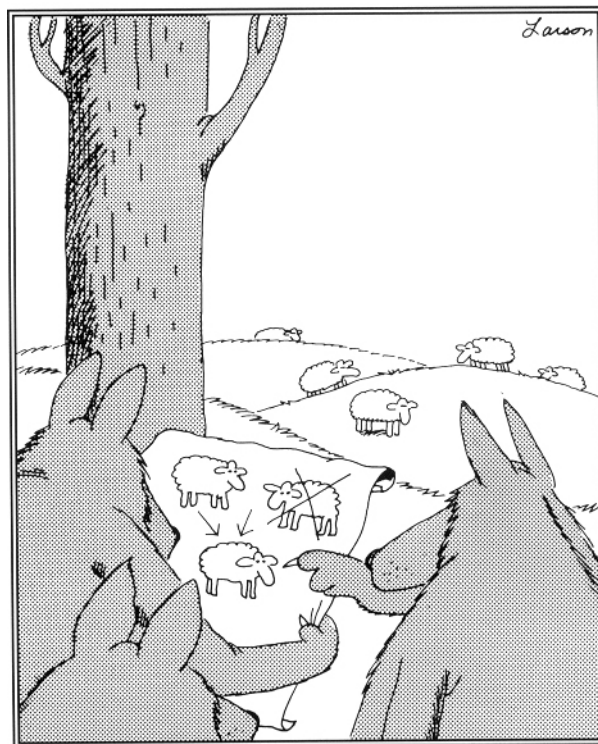


Name _____

BIOL 103 – Exam 1 – Fall 2007



Natural selection at work

Please do not start until you have been asked to do so.

If you have any uncertainty regarding what the question is asking for, please consult the instructor.

1. (4 pts) How many people are there on earth? _____

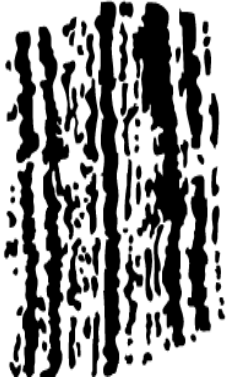
2. (4 pts) How old is the earth? _____

3. (4 pts) When did the last ice age end? _____

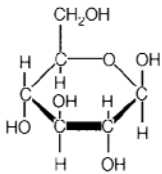
4. (12 pts) Describe three key differences between articles in popular magazines and articles in scientific journals. You can make a list if you want to.

5. (8 pts) Carbon dioxide is a colorless, odorless gas naturally present in the earth's atmosphere that has the unusual property that it "traps" heat from the sun, and thereby warms the planet. Humans are releasing gigatons of carbon dioxide into the atmosphere each year by burning coal and oil. The Swedish chemist Svante Arrhenius predicted in the 19th century that this carbon dioxide would cause global warming. Recent observations have shown that the amount of carbon dioxide levels in the earth's atmosphere has risen dramatically in the past 100 years and that the earth is warming. If these observations are accurate, does this prove Arrhenius was correct? Explain your reasoning.

6. (8 pts) Describe two pieces of evidence that glaciers were much more extensive thousands of years ago. Include an explanation of how this evidence is interpreted.



7. (8 pts) What does the figure on the left show? How do the stripes differ from each other? How were these observations interpreted?



8. (8 pts) The figure to the left shows a glucose molecule, an important structural component of plants, and an important source of energy for animals. Write out the chemical equations that show how plants make glucose and how animals burn it.

9. (4 pts) What is the difference between an atom and a molecule?

10. (8 pts) Explain the relationship between nucleic acids, amino acids, proteins, and DNA.

11. (4 pts) A population of water lilies is growing on a pond. Each day the population doubles in size. In 30 days the entire pond will be covered by lilies. How long will it take for half the pond to be covered?

12. (4 pts) If Bozeman's population grows by 2% per year, how many years will it take to double in size?

13. (4 pts) You inherit \$10,000 and invest it in the stock market. How much will your investment be worth when you retire in 30 years if it increases in value by 7% per year?

14. (12) A population of ground finches on the Galapagos Islands eats seeds. Before a drought, the size of the beaks of the finches varied from 7 to 13 mm, with an average size of 9.5 mm. During a drought, there was a shortage of small seeds, and birds with small beaks had a difficult time eating the large seeds that were available. Most of the birds starved to death. After the drought, the average beak size in the population was 10 mm. Is this an example of natural selection in action? Explain your reasoning with reference to the requirements for evolution by natural selection.

15. (8 pts) According to the textbook, what is the "Lesson of Easter Island?"