

Quiz 1 Key
BI-102-2, Fall '08, Dr. C. S. Tritt

Each problem was scored on a 10 point scale and the total was divided by 0.6 to put the final score on a 100 point basis.

1. State a reasonable definition of life (feel free to use mine, the one in the book or your own).

I say: Any self-replicating process that converts energy into order.

The book's definition is much longer and includes: cellular organization; ordered complexity; sensitivity; growth, development and reproduction; energy use; homeostasis and evolutionary adaptation.

2. Briefly describe two of the unifying themes of biology that are mentioned in your textbook or discussed in lecture.

Any two of the following: **cell theory**; **molecular basis of inheritance**; **relationship between structure and function**; **unity and diversity arising from evolutionary change**; cells as information processing systems and emergent properties. The items in **bold** are both in the book and were covered in lecture. Also, using energy to create and maintain order – not in book, but correct.

3. Name or describe a modern type of evidence supporting Darwin's hypothesis that was not available to him.

Any one of the following: the fossil record; the age of the Earth; the mechanism of heredity; comparative anatomy; molecular evidence and developmental sequences. *Developmental sequences* is not in the book.

4. State what is required to move an electron into an orbital more distant from a nucleus.

Energy.

5. Water has several attributes that makes it important to life on earth, name one of these attributes and briefly explain in what way it makes water important to life.

Any one of the following: cohesion; large specific heat; large heat of vaporization; density decrease upon freezing and good solvent. Also, water can participate in condensation (dehydration) and hydrolysis reactions – not in book, but important and correct.

6. With respect to aqueous acid-base chemistry, give a practical definition of the term *buffer*.

A buffer is a solution that resists changes in pH. It takes more moles of acid or base to change the pH of a buffer a given amount than it does for a non-buffer.