

Astronomy 305: Life in the Universe  
Homework 5: Chapter 5

Total points: 60

1. (10 pts) Briefly describe the six key properties that appear to be shared by most living organisms on Earth.
2. (14 pts) What is natural selection? Summarize the logic by which Darwin came to the "Inescapable conclusion" that evolution occurs by natural selection. Describe some of the evidence that supports Darwin's theory of evolution.
3. (10 pts) Briefly describe each of the four main classes of cellular molecules: carbohydrates, lipids, proteins, and nucleic acids. What are enzymes, and where do they fit into this picture?
4. (10 pts) What is metabolism, and what are the two basic metabolic needs of any organism? Explain the four metabolic classifications listed in Table 5.1 (For the second part of this question, please do not attempt to fully explain the four classes; rather, just very briefly state the defining characteristics of each metabolic class.)
5. (10 pts) Why is water so important to life on Earth? List the three major roles that water plays in metabolism.
6. (2 pts) Natural selection is the name given to
  - (a) the occasional mutations that occur in DNA;
  - (b) the mechanism by which advantageous traits are preferentially passed on from parents to offspring;
  - (c) the idea that organisms can develop new characteristics during their lives and then pass these to their offspring.
7. (2 pts) An organism's heredity is encoded in
  - (a) DNA;
  - (b) ATP;
  - (c) lipids.
8. (2 pts) People belong to domain
  - (a) eukarya;
  - (b) archaea;
  - (c) bacteria.