

Geology 120
Problem Set #3
Ch. 8-10
due 3/16

Metamorphic Rocks

1. What does it mean when a mineral is unstable at a certain temperature and pressure? Why is this mineral likely to metamorphose into something else?
2. What are five factors that control metamorphism?
3. What is metasomatism and where in what kind of metamorphic environment is it likely to occur? Why is it different from regular metamorphism?
4. What is the difference between lithostatic pressure and differential pressure?
5. Describe the geometrical relationship between differential stress directions and the orientation of foliations and cleavage planes in metamorphic rocks.
6. List and briefly describe the 6 different types of metamorphic environments that we talked about in class - would you find foliated or non-foliated metamorphic rocks (or perhaps both) in these environments?
7. What is the difference between index minerals and metamorphic facies? What do both tell us about an area that has undergone metamorphism?

Geologic Time

1. Describe how the scientific ideas about geologic has changed in the last 200 years.
2. Explain the six fundamental principles of relative dating.
3. How does and unconformity develop? What are three different types?
4. If you want to calculate the absolute age of an intrusive igneous rock, what information would you need?
5. Describe fission-track dating.
6. Why can't sedimentary rocks be dated radiometrically?
7. You find a fossil bone fragment in your back yard – laboratory analysis reveals a C-14 concentrations that is 0.352 as great as modern plants. Calculate the age of your sample.

Earthquakes

1. What is an earthquake?
2. List the major differences between P and S waves.
3. What type of seismic wave causes the most destruction and why?
4. List and explain 4 factors that affect the amount of destruction caused by seismic vibrations.
5. What is the difference between the *intensity* and *magnitude* of an earthquake? How are each measured?
6. Describe the mechanism that leads to the generation of a tsunami.
7. What is seismic tomography and what can it be used for?