GLG 101 Possible Exam 1 Essay Questions

Instructions: For your exam 1 homework, you must complete two of the essay questions below, and turn them in on the day of the exam. Essay questions turned in after the exam WILL NOT be accepted, unless prior arrangements have been made. The exam will contain one or two of the questions below.

1. While shopping for land on which to build a mountain cabin, you notice that the rocks exposed on the land are shattered and fractured. Describe how you could scientifically think about this situation to see if the land has geologic hazards. In other words, list each step involved in the Scientific Method and explain what you would need to consider at each step.

2. Describe the concepts of catastrophism and uniformitarianism, and discuss their historical origins.

3. Sketch a simplified cross section of a (1) divergent, (2) convergent, and (3) transform plate tectonic boundary. Label and annotate each sketch appropriately and give a modern-day example of where you might find each kind of boundary.

4. Sketch and label the different stages of continental rifting and the formation of a new ocean basin, and describe what is happening at each stage.

5. Discuss the relation between plate boundaries and the occurrence of earthquakes, volcanoes, and mountain belts. Using the world relief map below, shade in the general distribution of where most earthquakes occur.

6. Discuss how the numbers of electrons in the outer electron shell controls whether and how an atom bonds to another atom. Draw a sketch illustrating how this works for two of the four types of bonding discussed in your text and during lecture. For each sketch, give an example of a mineral or product that uses this type of bonding.
7. Make some observations about the rocks in the photograph below. List a possible environment in which this rock could have formed, and describe what you would need to look for to verify your chosen environment.

Hint: the material surrounding the rock pieces and the rock fragments are composed of the same material.

8. Describe some uses for the following minerals: (1) quartz; (2) calcite; (3) gypsum; and (4) muscovite.

9. Critical Thinking Exercise: Some homeowners say that a water well near their properties has high amounts of arsenic. They claim that the water in the well has been contaminated by a large pond associated with a coal-burning power plant. You have all the money you need to investigate this claim. How would you proceed, and why?