

Name: _____

HOUR EXAMINATION #1
Geology 200: Processes and Concepts of Geology
Study Exam

- 1 – Why are rhyolitic magmas more viscous than basaltic magmas? How does this difference factor into the character of the eruption? (8 pts.)

What type of magmas erupted at Mt St. Helens (In the Cascades of the State of Washington)? What is the tectonic setting of this region? (2 pts.)

2. How do the silicate structures of the minerals in the discontinuous sequence in Bowen's Reaction Series change with decreasing temperature of the magma? [6 points]

3. What determines the relative stability of minerals at the Earth's surface (why are some minerals more susceptible to weathering than others)? (6 pts.)

4 – Identify or describe three of the following terms. Use examples and diagrams when helpful. (20 pts.)

Sedimentary facies

Faunal succession

Walther's Law

Exfoliation

mineral

AFM diagrams

5. Why do we have many basaltic eruptions at the Earth's surface but relatively few silicic (or rhyolitic) ones? (8 pts.)

6. How do the character of sediments change as you move downstream in a fluvial (stream) system?
Be sure to include discussion of grain size, rounding, mineralogy etc.. In each case explain why the downstream change occurs. (10 pts.)

7. This is the stratigraphic section of the Great Canyon. List the units and events (erosion, intrusion, *etc.*) in their relative sequence order, placing the oldest at the bottom. Along with the sequence, label on the diagram any unconformities, giving them the proper names (*disconformity*, *angular unconformity*, or *nonconformity*) (12 pts.)

Diagram Here

How can one recognize a disconformity? (4 pts.)

8. This cross-section shown below is a sequence of Cambrian Rocks in the Grand Canyon. The number 1 through 9 are stratigraphic columns at the locations on the map. The dotted lines are time lines. Answer the following questions based on this diagram:

a - Does this section represent a transgression or regression of the sea? why?

b - What is your evidence for your answer above?

c - During the Cambrian in which direction would you travel from location 4 to get to the shoreline, west or east?

d - What is your evidence for your answer above (part c)?

e - What is the approximate age of these rocks in millions of years before present? (10 pts.)

9. Describe the agents of metamorphism (what processes form metamorphic rocks?) (8 pts.)

10 . The *asthenosphere* is a portion of the mantle that is "partially molten". How could there be a molten zone surrounded by solid material? (6 pts.)

Bonus: How do we think we know that the age of the Earth is 4.6 billion years old? (2 pts.)