

Geology 101

**Sample exam 2 (Chapter 6, 7 and 8)**

*Open notes, closed textbook, open labs and handouts, no collaboration.* You have 50 minutes to complete the 50-point quiz.

**Short answer** — (2 points for each, except as stated); answer all questions.

1. (3 points) Write the *full* citation of one **non-electronic, non-encyclopedia, non-textbook source** you are going to use for your poster.

2. (3 points) Referring to the **cross-section**:

a. Give the **letter** of the oldest formation.

b. Is the **fault** older than the **dike**?

c. If the dike is dated **radiometrically** as 70 million years old, is that date **consistent** or **inconsistent** with the fossil information?

3. (3 points) Still referring to the cross-section above, circle the correct choice within the parentheses:

a. This area was or is undergoing (extensional, compressional, shearing) **stress**.

b. The **orogeny** in this area can be described as (volcanic, fold-and-thrust belt, fault block).

c. These types of mountains will be found near or at a (convergent, divergent, transform) **plate boundary**.

4. a. The boundaries between **periods** on the geologic **time scale** are defined by what type of event?

b. Therefore the periods themselves are defined by its (circle one):

i. rocks      ii. fossils      iii. geographic features      iv. attitude

5. (3 points) Isotope Q has a **half-life** of 5 years. All living things contain the same amount of Q, as long as they continue to breathe. Fluffy the cat has been missing for a while. Sadly, her bones were found and had only **one-eighth** (1/8) the amount of Q that the bones of living things have. How many years has Fluffy been “missing”? You can show a calculation or you can simply write an answer.

For questions 6 and 7, choose **one** of the words contained in **each** set of parentheses (see example):

Example: If I don't pay attention to the amount of time left on the exam, I will fail to do the (short answer/essay) section and therefore perform quite (well/poorly).

6. **A mature sandstone's** grains tend to be (angular/rounded) and (well-, moderately-, poorly-) sorted.

7. **Foliation** in a metamorphic rock indicates (directed/lithostatic/intense) pressure; an example of a foliated rock is (quartzite/sandstone/blueschist).

8. True or false: All sedimentary rocks can be classified by their grain size.

**Essay questions** — (15 points each); answer **two** of the following. Please circle the numbers of the questions you want graded.

11. You are a climate scientist working on the question of when the last Ice Age ended in the Pacific Northwest. You take a core of the sediments at the bottom of an alpine lake. Careful analysis of the bottom (oldest part) of the core yields two materials: pollen grains from an unidentified tree and quartz grains that show striations left by the receding glacier. You have enough research funds to numerically date **one** of the materials.

- **Which material** would you date?
- **What dating method** would you use?
- And how come the other material would **not** yield a useful age?

(Assume that there will be no errors due to the dating method used — in other words, lab error will be negligible).

12. A **mineralogist** tells you the **major minerals** in a metamorphic rock are chlorite, quartz and blue amphibole. A **geochemist** tells you the **elemental composition** of the same metamorphic rock is silicon dioxide 72.24%, aluminum oxide 8.32%, calcium oxide 1.84%, iron oxide 7.85% and magnesium oxide 6.39%.

Which person, if either, gave you more useful information in determining how much metamorphism has occurred? Which person, if either, gave you more useful information in determining what rock was originally metamorphosed? **Justify** your answers!

13. The Manastash Formation is a cross-bedded sandy siltstone with numerous whole and partial leaf imprints (those of you who went on the Cle Elum field trip saw this, though it's not critical to have been there). Using the diagram below question 8 on Lab 5, choose the **depositional environment** of the Manastash Formation, and defend your answer.