EXAM II REVIEW – GG101 Dynamic Earth

Use complete sentences and sketches to answer each question below. The more information you can provide the better!

Igneous Rocks and Volcanoes

1. What part of the Earth's internal structure is the source of igneous material for ALL volcanic eruptions?
2. Along what type of plate boundary do the vast majority of Earth's volcanic eruptions occur? What is the second most common location?
3. What are the three most common EXTRUSIVE volcanic rock types on Earth? What are the corresponding INTRUSIVE rock types?
4. Using Bowen's Reaction series, describe what happens to the chemistry of a magma as it cools from 1200˚C to 750˚C.
5. In addition to magmatic differentiation, what two other processes can cause changes in the composition of a magma over time?
6. Which plate boundaries are most likely to have basaltic eruptions? Which plate boundaries are most likely to have andesite eruptions? Where are you likely to find rhyolite lavas?
7. What shape do hot spot volcanoes usually have? What causes this shape?
8. What shape do convergent margin volcanoes usually have? What causes this shape?
9. What shape do intra-continental volcanoes usually have? What causes this shape?
10. What plate tectonic setting produces the world's most explosive eruptions? What plate tectonic setting produces the world's least explosive eruptions?
11. What are two types of dangerous flows that are related to eruptions at convergent boundaries? What is the material in each?

Weathering and Sediments

1. What is the age of the Himalayas relative to the Appalachians? How do you know?
2. What three processes contribute to mountain destruction? Define each process?
3. What is unique about the solid form of water? How does this contribute to frost wedging?
4. Describe how talus is formed? How do we know that talus has not been transported long distances?
5. What happens to a pluton or batholith when the overlying sediments are removed?
6. Give two examples of biological weathering?
7. How does mechanical weathering change the exposed surface area of rocks?
8. What is the primary agent of chemical weathering? How has chemical weathering changed in response to the burning of coal?
9. What is the most common continental rock type? What are the two products of chemical weathering of this rock type?

Sedimentary Rocks

10. What are the two processes that change sediments to rocks?
11. How does the porosity of a material change during the transition from a sediment to a rock?
12. Describe the difference in origin of a detrital vs. a chemical sedimentary rock?
13. In a detrital sedimentary rock, what does grain size tell us about the environment of deposition?

14. In a detrital sedimentary rock, what do sedimentary structures tell us about the environment of deposition?
15. What can fossils tell us about ancient life forms and their environment?
16. What are the White Cliffs of Dover made of? What type of sedimentary rock do these represent?
17. Give two examples of commercially useful evaporites? How do they form?
18. Describe the types of rocks you would expect to find related to the former locations of: streams, glaciers, alluvial fans, sand dunes, beaches.
19. Examine a 3-dimensional geologic cross section (similar to what we saw in class). Assign relative ages from youngest to oldest for each material.

<u>Metamorphic Rocks</u>

20. What three forces/processes contribute to the development of metamorphic rocks?
21. How is Earth's geothermal gradient changed by a subducting slab? How is it changed by convergent volcanism?
22. Describe how a roof pendant is formed?
23. How can we use a metaconglomerate to determine the direction of pressures acting on a rock?
24. Describe the interaction between seawater and magma that takes place at a mid-ocean ridge? What type of deposits does this interaction produce?
25. Describe a foliated rock?
26. Where does regional metamorphism occur? Give one modern and one ancient example of regional metamorphism?