

**Review for final exam Dec. 13, 2004= Important Points to Know for Each Chapter**

**Crustal Deformation & Structural Geology**

1. Know the different types of deformation (compression, extension, shear stress). Explain the differences between confining pressure, differential stress, compressional stress, tensional stress, shear, and strain.
2. What are strike and dip? How are they measured?
3. Describe the major features of folds and identify the various types of folds. Know the difference between anticline, syncline, monocline, dome, and basin and where the youngest strata are exposed when eroded.
4. List and describe the various types of faults. Know the difference between normal fault and thrust or reverse fault, hanging wall, foot wall.
5. What are horsts and grabens?
6. What are strike slip faults and what is an example?
7. Explain the difference between a fault and a joint. How do joints form? How do they differ from faults?
8. What are limbs and hinge planes on folds? What is plunge in a fold?
9. What is the difference between ductile and brittle rock deformation?

**Earthquakes**

1. Describe what an earthquake is and what causes it. What is an earthquake, elastic rebound, aftershocks, fault creep?
2. Discuss the types of seismic waves emitted during an earthquake and the instrument used to record them. What is a seismograph and how does it work?
3. Know the difference between the surface waves and the various body waves (P and S waves), which gets there first, how they travel and whether they travel through liquid.
4. Explain how the epicenter of an earthquake is located. Know how to locate the source of an earthquake. What is an epicenter and focus of the earthquake?
5. Where are two of the major earthquake belts (circum-Pacific and mid-ocean ridge) and why are there earthquakes in those places?
6. What is earthquake magnitude? How is it measured? What are two of the scales on which it is measured (Richter and moment Magnitude) and how are they different?
7. Distinguish between earthquake intensity and magnitude. What is earthquake intensity? How is it determined? What is the scale on which it is measured (Modified Mercalli Intensity Scale)?
8. How does the elastic rebound theory explain the behavior of earthquakes?
9. What is liquefaction? How does the type of material under buildings affect the amount of damage they sustain during an earthquake?
10. What are tsunamis? What causes them? How do their characteristics differ in the open ocean and near land?
11. What are some of the major damages in an earthquake other than that due to the ground

shaking?

12. What should you do during an earthquake?
13. Relate earthquake activity to plate tectonics.

## **Plate Tectonics – Chapter 19**

1. Explain some of the evidence for ‘continental drift’: fit of continents, fossil evidence (*Glossopteris* and *Mesosaurus*), continuation of mountain belts, and paleoclimates, polar wandering paths for N.A. and Europe.
2. What is sea floor spreading? How do the geomagnetic reversals and mirror images of magnetic bands across the mid-ocean ridge support plate tectonics?
3. What are the differences between convergent, divergent, and transform margins? Give examples.
4. What was Pangea?
5. What are the characteristic landforms from the 3 types of convergent margins and give examples.
6. How does the distribution of shallow, intermediate, and deep-focus earthquakes support plate tectonics?
7. What are hot spots and how does the Hawaiian Islands indicate the direction and rate of plate motion?
8. What is subduction? Where does it occur? What are the possible driving forces for subduction?
9. How do continent-continent, ocean-continent, and ocean-ocean plate convergence differ?
10. How do tectonic plates form, collide, and how are they destroyed?
11. How does the internal structure of the earth differ based on composition and based on the physical properties?
12. What causes earthquakes and volcanic eruptions, and where are they most common?
13. Where does new crust form?
14. What is subduction? Where does it occur? What are the possible driving forces for subduction?
15. What is the evidence for continental drift? For sea-floor spreading?
16. How is the orientation of the magnetic field preserved in rocks?
17. What are paleomagnetic reversals? How do they provide evidence for sea-floor spreading?
18. How do convergent, divergent, and transform plate margins differ in their characteristics?
19. Where is the oldest oceanic crust? The youngest oceanic crust?
20. Why isn't there any oceanic crust older than Jurassic in age?
21. How is the age of the oceanic crust related to mid-ocean ridges?
22. What are mantle plumes and hot spots? Where do they form? What happens to tectonic plates as they pass over them through time?
23. How do continent-continent, ocean-continent, and ocean-ocean plate convergence differ?
24. What are the range of velocities for the movement of tectonic plates?

## **Energy and Mineral Resources**

1. What are the igneous, sedimentary, metamorphic, and weathering processes by which ore deposits form?
2. Why are most mineral and energy resources considered nonrenewable?
3. What are the origin, environmental impact, and estimated reserves of fossil fuels?
4. What are the three types of coal?
5. How does oil and natural gas accumulate?
6. How is nuclear energy in obtained, and what are the problems with its use?
7. What are the major renewable sources of energy and their limitations?
8. How has the world's population grown?
9. What will limit the population of the Earth?
10. What is the projected population limit for our planet? When will that limit be reached?
11. Distinguish among renewable and nonrenewable resources.
12. Describe the occurrence and use of fossil fuels.
13. Analyze the environmental effects of burning fossil fuels.
14. Review the various alternative sources of energy.
15. Define a mineral resource, reserve, and ore.
16. Describe the igneous, metamorphic, and weathering processes associated with the development of mineral resources.
17. Discuss placer deposits and nonmetallic mineral resources.

