GEOL 1121 – Earth Materials, Processes and Environments
Review for Exam 4

The following is an attempt at a study guide for Exam 4. This exam will only cover information from Chapters 12 and 13.

Chapter 12 Vocabulary: abrasion, alluvial fan, alluvium, base level, bed load, braided stream, capacity, competence, cut bank, delta, discharge, dissolved load, divide, drainage basin, drainage pattern, floodplain, hydraulic action, hydrologic cycle, incised meanders, infiltration capacity, load, meander, meandering stream, natural levee, oxbow lake, point bar, runoff, stream, stream terrace, superposed stream, suspended load, valley, velocity

Chapter 12 Questions

1. What percentage of all water is in the oceans? In ice? Stored as groundwater?
2. What two primary types of flow does runoff occur as?
3. Give the proper units for a stream's gradient, stage, velocity and discharge.
4. How do hydrologists determine a stream's discharge?
5. A stream's velocity ***increases*** from the headwaters to its mouth. What are the four factors governing stream velocity? Which factors tend to increase velocity? Decrease?
6. What types of materials make up the different segments of the load of a stream?
7. What factors (velocity, stage, discharge or gradient) are best related to the competence and capacity of a stream?
8. Describe the two basic types of stream systems.
9. How do point bars and cut banks form?
10. What kind of deposition occurs to form a floodplain? What is the difference in particle size between channel and floodplain deposits?
11. What is a 100-year flood? How is it related to the "100-year floodplain"? Is it possible to have two 100-year floods in a one-year period? Why or why not?
12. Give five reasons why people choose to live on floodplains.
13. Describe and/or illustrate what happens along the course of a stream when a) sea level rises; b) sea level falls; or c) a dam is constructed on a stream.
14. Be able to describe the map patterns and underlying geology related to the draining patterns shown in your text.
15. You should be able to define, draw and/or describe a graded stream. What factors have to be in balance in order that a stream be graded?
16. How are the processes of downcutting, lateral erosion, and headward erosion related to each of the following: a) stream piracy; b) incised meanders; and c) water and wind gaps?

Chapter 13 Vocabulary: aquiclude, aquifer, artesian system, capillary fringe, cave, cone of depression, confined aquifer, geothermal energy, geyser, groundwater, hot spring, hydrothermal, karst topography, permeability, porosity, salt water incursion, sinkhole, spring, subsidence, unconfined aquifer, water table, water well, zone of aeration, zone of saturation

Chapter 13 Questions

1. What percentage of all unfrozen *fresh water* is groundwater?
2. Explain how groundwater weathers and erodes Earth materials.
3. Explain why wells in South Georgia produce more water than wells in the Atlanta area.
4. Be able to define/describe the terms **porosity**, **permeability**, **saturation** and **recharge** and their relationship to each other.
5. What are the types of porosity?

2. What properties of the rock and soil are necessary for something to be a good aquifer? Why might joint or fracture systems be important?
3. What properties of the rock and soil are necessary for something to be a good aquiclude?
4. What four factors govern the flow of groundwater?
5. How do the zones of saturation and aeration relate to the water table? Where is the capillary fringe in relation to the above?
6. Explain the similarities and differences between confined and unconfined aquifer systems.
7. How does a spring form, and how is this related to aquifers?
8. You should be able to draw an illustration showing the different types of aquifer systems, and how springs might form.
9. What are the geologic conditions necessary for an artesian system to develop?
10. Why and how do cones of depression form?
11. The chief threat to groundwater resources is overuse. What are three effects of overuse on an aquifer system? Be able to describe each effect and the consequences in detail.
12. What are some types of groundwater contamination? What has been done since 1970 to help solve these problems?
13. Karst topography is established in areas underlain by what type of sedimentary rock? What type of weathering is primarily responsible? What are some of the physical features of a karst area?
14. How is karst related to cave formation? What are some of the physical features of caves and caverns?
15. Explain how a geyser works. Give a location where geysers can be seen.
16. What happens at a geothermal energy plant? What type of energy is used and converted? What type of energy is generated?