

## **Review for Exam 1 Geology 860, Spring 2011**

**The test will cover chapters 1, 2, 3, 4, and 6. In addition to doing the reading and studying your notes please review the material that I have put online.**

### **Chapter 1 Review class notes and posted presentation.**

How old is the Earth?

What is thought to have caused the extinctions of the dinosaurs?

Diagram the rock cycle

Diagram the hydrologic cycle

### **Chapter 2 Minerals**

Do minerals with the lowest silica content melt at the lowest temperatures?

What is the definition of a mineral?

Which of the following is not a rock-forming mineral?

- (a) pyroxene
- (b) feldspar
- (c) galena
- (d) quartz

The silicate tetrahedron consists of

- (a) four central silicon ions surrounded by one oxygen ion.
- (b) four central oxygen ions surrounded by four silicon ions.
- (c) one central oxygen ion surrounded by three silicon ions.
- (d) one central silicon ion surrounded by three oxygen ions.
- (e) one central silicon ions surrounded by four oxygen ions.

Which of these minerals commonly forms by evaporation of seawater?

- (a) clay
- (b) halite
- (c) feldspar
- (d) quartz.

### **Chapter 3 Rocks**

Are plutonic rocks usually medium- or coarse-grained? Why? What about volcanic rocks

Where do volcanic rocks solidify or 'freeze' within the Earth's crust or on the surface?

Is basalt mineralogically identical to gabbro? Diorite? Granite?

What makes granite and rhyolite different?

Reference the figure showing silicate structures - Does granitic magma have more minerals with longer silicate tetrahedra chains of than basaltic magma?

Extrusive igneous rocks form when

- (a) magma solidifies within the asthenosphere.
- (b) magma solidifies within the Earth.
- (c) sediment cements together.
- (d) magma erupts and solidifies on the Earth's surface.

The same set of minerals that solidify slowly to form granite can also erupt to form

- (a) rhyolite.
- (b) andesite.
- (c) basalt.
- (d) diorite.
- (e) gabbro.

Basalt consists of approximately equal amounts of

- (a) plagioclase feldspar and peridotite.
- (b) plagioclase feldspar and pyroxene.
- (c) diorite and pyroxene.
- (d) granite and rhyolite.
- (e) diorite and andesite.

Sandstone, siltstone, and shale are

- (a) clastic sedimentary rocks.
- (b) organic sedimentary rocks.
- (c) chemical sedimentary rocks.
- (d) igneous rock.
- (e) metamorphic rock.

The higher silica content of granitic magma causes it to

- (a) erupt at the surface.
- (b) solidify within the crust.
- (c) become highly viscous.
- (d) b and c.

What is the last mineral left when you weather everything else away from a granite

- (a) calcite.
- (b) feldspar.
- (c) quartz.
- (d) mica.

#### **Chapter 4 Geologic Time**

How does sediment grainsize and sorting change down stream from its source?

What is the pH of pure rain, falling in remote locations away from cities?

What are dikes and sills and how are they different?

How are sedimentary rocks deposited originally – in horizontal or vertical strata?

Which is typically older in layered sediments – the sedimentary layers on top or bottom?

If a dike cuts through a sedimentary layer is it younger or older than that layer?

What is an unconformity? What about a disconformity, angular unconformity and nonconformity?

What is the law of superposition? What is the law of original horizontality?

Relative age measurement refers to

- (a) age measured in years.
- (b) the order in which events occur.
- (c) age measured only by carbon-14 dating.
- (d) age measured only by potassium-argon dating.

The principle of original horizontality is based on the fact that

- (a) sediment usually accumulates in horizontal layers.
- (b) sedimentary rocks generally become younger from bottom to top.
- (c) sedimentary rocks must be older than an intruding dike.
- (d) rocks can be dated by studying radioactive decay of the elements.

### **Chapter 6 Plate Tectonics**

Reference the layered earth figure.

Diagram the layer cake earth

Which is thicker oceanic or continental crust? How thick are they?

Why is the Mid-Oceanic Ridge elevated above surrounding sea floor?

What is the plate boundary at the mid-oceanic ridge – transform, spreading or collision?

What type of magma forms at the mid-oceanic ridge?

What is the cause of volcanism at Yellowstone National Park? Is it at a plate boundary? What about Hawaii?

Do large explosive volcanic eruptions have no effect on global climate?

Average oceanic crust is \_\_\_\_\_ kilometers thick whereas average continental crust is \_\_\_\_\_ kilometers thick.

- (a) 20 to 40, 5 to 10
- (b) 50 to 100, 200 to 400
- (c) 4 to 10, 10 to 70
- (d) 200 to 400, 50 to 100

At a divergent boundary between spreading tectonic plates in oceanic crust,

- (a) one plate subducts beneath the other.
- (b) rock and magma rise to form the Mid-Oceanic Ridge.
- (c) rock sinks to form an oceanic trench.
- (d) rock rises to form continents.

The Mid-Oceanic Ridge is elevated above the surrounding sea floor because

- (a) it is made of the oldest, coolest, and most dense lithosphere.
- (b) it is made of the newest, hottest, and lowest-density lithosphere.
- (c) it is full of gas bubbles.
- (d) it is very old.

When a plate carrying continental crust converges with a plate carrying oceanic crust,

- (a) the oceanic plate floats above the continental plate.
- (b) the continental plate sinks into the mantle.
- (c) a divergent boundary forms.
- (d) the oceanic plate sinks beneath the continental plate and dives toward the mantle.

Where two plates carrying continental crust converge

- (a) they form huge mountain ranges.
- (b) they form a subduction zone and one plate sinks into the mantle.
- (c) they form a transform boundary.
- (d) they form a mantle plume.

At a transform boundary

- (a) one plate subducts into the mantle.
- (b) a Mid-Oceanic Ridge forms.
- (c) two plates slide horizontally past each other.
- (d) earthquakes are common.
- (e) c and d.

The Himalayan Mountain Range is an example of

- (a) a convergent boundary.
- (b) a divergent boundary.
- (c) a transform boundary.
- (d) a Benioff zone.
- (e) a rift valley.

Tectonic plates typically move at rates of

- (a) 1 to 16 feet per year.
- (b) 1 to 16 meters per year.
- (c) 1 to 16 centimeters per year.
- (d) 1 to 16 kilometers per year.

The Hawaiian Islands are an example of

- (a) a microcontinent.
- (b) a volcanic center at a hot spot.
- (c) isostasy.
- (d) a convergent boundary.

The "ring of fire", a zone of concentrated volcanic activity encircling the Pacific Ocean basin, is located adjacent to

- (a) rift zones.
- (b) subduction zones.
- (c) the Mid-Oceanic Ridge.
- (d) a lava plateau.
- (e) the San Andreas fault.

Typical granitic magma contains \_\_\_\_\_ silica and \_\_\_\_\_ water than typical basaltic magma.

- (a) more, less
- (b) less, less
- (c) more, more
- (d) less, more.