A Example Quiz on Earthquakes

Quizzes such as this one are given at the beginning of each lab.

1. The point beneath the Earth's surface at which an earthquake originates (the point where breakage of rock occurs) is called the _____.

2. _____ **(T/F)** P wave travel faster than S waves.

3. The instrument used to measure earthquake intensity is a _____.

4. How many seismic measurements are necessary in order to plot the location of the epicenter of an earthquake? _____.

5. A break in the earth's crust along which there has been movement is called a _____.

6. Where do most earthquakes occur?_____.

Some terms to consider for possible answers to the questions above include *fault, active fault, blind fault, P wave, S wave, surface wave, seismograph, seismogram, epicenter, focus, fault scarp, Richter scale, Mercali Index, and risk.*

B Midterm Laboratory Exam Review

Review labs 1-6 and be prepared for any questions off of old quizzes and in-class exercises. Be able to do the following:

1. Compute unit conversions, given the required equalities,
2. Determine density for a given rock specimen,
3. Read a topographic map, determining latitude, longitude, contour interval, and main features,
4. Calculate a topographic gradient, given a contour map, and
5. Identify the following minerals without a key, giving your reasoning:
    - calcite
    - feldspar
    - galena
    - graphite
    - gypsum
    - halite
    - magnetite
    - malachite
    - pyrite
    - quartz
6. Identify the following igneous rocks:
    - pumice
    - obsidian
    - rhyolite
    - granite
    - andesite
    - diorite
    - basalt
    - gabbro
7. Identify the following sedimentary rocks:
    - limestone
    - shale
    - sandstone
    - conglomerate
    - breccia
8. Identify the following metamorphic rocks:
    - gneiss
    - schist
    - slate
    - marble
    - quartzite

Name:_____ Section: _____

C Example Midterm Laboratory Exam

1. Compute the following unit conversions. Show your work. (1 meter= 3.28 feet)

   - 5 meters = _____feet

   - 5 m^2 = _____ft^2

   - 5 m^3 = _____ft^3

2. If a rock weighs 6 grams and has a volume of 2.2 cm^3, what is its density? (Show your work.)
   Is this density reasonable for the rocks we studied in lab? _____

3. For the topographic map below, what is the elevation at point Y? _____
   What is the gradient between points X and Y? (Show your work.)

4. Identify the following minerals, giving your reasoning. Put the item letter next to its name, and state briefly why you chose this identification.

   - _____calcite _____
   - _____feldspar _____
   - _____galena _____
   - _____gypsum _____
   - _____halite _____
   - _____magnetite _____
   - _____malachite _____
   - _____mica _____
   - _____pyrite _____
   - _____quartz _____

5. Identify the following igneous rocks:

   - _____pumice
   - _____rhyolite
   - _____granite
   - _____andesite
   - _____diorite
   - _____basalt
   - _____gabbro

6. Identify the following sedimentary rocks:

   - _____shale
   - _____sandstone
   - _____conglomerate
   - _____breccia

7. Identify the following metamorphic rocks:

   - _____gneiss
   - _____schist
   - _____slate
   - _____marble

D Review for Final Laboratory Exam

For the lab final, be prepared to perform any of the following tasks:

- Answer any questions that have appeared previously on lab quizzes.
- **Streams:** Read a topo map, determining elevations and calculating gradients; identify drainage patterns; determine the location of a drainage divide; calculate stream discharge, given a stream cross-section and velocity; recognize major stream features, including meandering and braided streams, oxbows, point bars, and cutbanks.
- **Ground Water:** determine the hydraulic-head gradient and direction of flow; use Darcy's Law to calculate a groundwater velocity; identify potential groundwater contaminants.
- **Glaciers** Identify major glacial features common in the Midwest including the Des Moines glacial lobe, erratics, and moraines.
- **Coastal Geology:** Determine direction of longshore current from topo maps and recognize structures to alter it, such as seawalls and groins. Use Google Earth to find a location and determine its elevation.
- **Earthquakes:** Determine the difference in travel time in P and S waves, given a seismograph.
- **Geologic Time:** Determine relative ages of geologic formations.

Name:_____ Section: _____

E Example Final Lab Exam

From the Quizzes

Terms to consider for answers below include *aquifer, impermeable, artesian, karst, confining bed, spring, porosity, permeability, stalactites, water table, potentiometric surface, zone of saturation, recharge, discharge, horn, drift, zone of accumulation, zone of ablation, terminus, plucking, alpine glaciation, continental glaciation, U-shaped valley, V-shaped valley, moraine, crevasse, beach, berm, barrier island, estuary, lonshore current, delta, headland, spit, tidal flat, submergent coastlines, emergent coastlines, wave-cut cliff, breakwater, sea wall, jettie, groin, fault, active fault, blind fault, P wave, S wave, surface wave, seismograph, seismogram, epicenter, focus, fault scarp, Richter scale, Mercali Index, risk, parent isotope, daughter isotope, relative dating, absolute dating, half-life, and unconformity.* You may also want to refer to the following laws and principles in answering the above questions:

- Law of Original Horizontality
- Law of Superposition
- Law of Inclusions
- Law of Cross-Cutting Relationships
- Principle of Fossil Succession

1. The upper boundary of the zone saturated with ground water is called the _____

2. The volume of void space (space filled with water or air) in sediment or rock is _____.

3. If water can flow easily through sediments or rocks, they are said to be _____

4. The sediment that accumulates along and at the end of a glacier is called a _____.

5. A _____is created when a large crack opens in a glacier.

6. A long narrow island that parallels the mainland coast is a _____.
7. A valley flooded by a rise in the level of an ocean or lake, particularly rich in biological life and protected from the open ocean is called an _____.

8. _____is the major mover of sediment along a coastline.
9. The point beneath the Earth's surface at which an earthquake originates (the point where breakage of rock occurs) is called the _____.

10. The instrument used to measure earthquake intensity is a _____.

11. How many seismic measurements are necessary in order to plot the location of the epicenter of an earthquake? _____.
12. A gap in the geologic record where layers were not deposited or are missing due to erosion is _____.
13. In a pile of mail, the oldest mail is at the bottom. This is like the law of _____.
14. The time it takes a half the parent isotope of a radioactive isotope to transform into the daughter isotope is called the parent isotope's _____
15. Most sediments are deposited in flat layers, like a layer cake. This is the law of _____.

From the labs

1. _____Discharge is an important concept. What statement best describes stream discharge? (a) It's a measure of stream volume per distance traveled (b) It's a measure of stream velocity (c) It's a measure of how much water is moving past a certain location along the stream each second.
2. _____Which part of the stream is flowing fastest? (a) Near the top (b) In the middle (c) At the bottom of stream.
3. Average velocity through the cross sectional area shown below is 10 ft/sec. Area of a trianlgle is

$$A = \frac{1}{2} base \times height \tag{4}$$

What is the discharge? _____

What are your units? _____

4. The following is a contour map of groundwater elevation. Use Darcy's Law,

$$\overline{v} = \frac{-K}{n}\frac{\Delta h}{\Delta l}, \tag{5}$$

to determine the velocity from point X. Mark with a line the path the water takes.
K= 25feet/day, n=25%

gradient =_____(units)

velocity = _____ _____(units)

travel time = _____ _____(units)

5. Identify the glacial features on the figure:

A _____

B _____

C _____

D _____

6. Draw an arrow on the figure below to indicate the direction of the longshore current.

7. For the figure below, place the letters in the order from youngest to oldest. _____

8. Of the two seismographs below, which one is farther from the epicenter of the earthquake?

_____Why?