

Name: ANSWER KEY

Section: YELLOW TEST

Test ID: B

Physical Geology GEOL 1100

Spring 2010

LECTURE EXAM 2

Instructions:

WRITE YOUR NAME AT THE TOP OF THIS PAGE.

Make sure the color of your test matches the colored stripe at the top of your bubble sheet.

Make sure the person next to you does not have the same color test.

Put away all papers, electronic devices, phones, Ipods, electronic dictionaries, and beverages. All backpacks, purses and bags should be zipped up and otherwise securely sealed.

We advise that you refrain from any actions that might be construed as cheating.

*Keep your eyes on your own paper.

*Do not hold your test up so that you can "see" it better.

*If you are wearing a hat, take it off or turn the bill so it faces backwards.

On the bubble sheet: **WRITE YOUR LAST NAME FIRST**
fill in the bubbles below your name.

Write your **W** number under "identification codes" but don't bother filling in the bubbles.

Write your section number under "special codes" but don't bother filling in the bubbles.

Section 10 = Tues 10-12 (Lee)

Section 11 = Tues 1-3 (Bridget)

Section 12 = Tues 3-5 (Laura W.)

Section 13 = Tues 7-9 (Ted)

Section 14 = Wed 8-10 (Lee)

Section 15 = Wed 1-3 (Bo)

Section 16 = Wed 3-5 (Laura W.)

Section 17 = Thurs 8-10 (Laura H.)

Section 18 = Thurs 10-12 (Ted)

Section 19 = Thurs 3-5 (Bridget)

This is a Multiple Choice test.

*Mark the choice that *best* completes the statement or answers the question.

There are **62** questions each worth roughly **2** pts towards your final grade.

*Mark your bubble sheet in pencil only; using a pen will result in a score of 0. Fill in the bubbles completely. Partially filled bubbles may be marked as incorrect by the scanner.

Sedimentary Rocks

- C 1. Diagenesis includes _____.
- a. the development of layering within sedimentary rocks
 - b. the act of deposition of sediment, which will ultimately form sedimentary rock
 - c. the physical and chemical alterations, such as compaction and cementation, that occur as sediment is transformed into rock
- B 2. Which transport medium carries the largest particles?
- a. wind
 - b. ice
 - c. water
- B 3. Which of the following is the smallest size class for detrital grains of sediment?
- a. gravel
 - b. clay
 - c. silt
 - d. sand
- D 4. Frost wedging, root wedging, and salt wedging are all examples of _____.
- a. erosion
 - b. deposition
 - c. chemical weathering
 - d. physical weathering
- C 5. Biochemical limestones are dominated by carbonate mud and fragments of _____.
- a. the phosphatic bones of fish
 - b. siliceous shells of planktonic diatoms and foraminifera
 - c. calcitic and aragonitic skeletons of marine invertebrates
 - d. the organic breakdown products of wood from trees
- A 6. What is the main difference between breccia and conglomerate?
- a. Conglomerates have more rounded grains, whereas breccia have more angular grains.
 - b. Conglomerates are finer grained than breccias.
 - c. Conglomerates are coarser grained than breccias.
 - d. Conglomerates have more angular grains, whereas breccias have more rounded grains.
- A 7. Which of the following minerals is least susceptible to chemical weathering?
- a. quartz
 - b. orthoclase feldspar
 - c. pyroxene
 - d. halite
- B 8. For sediments that are transported to the site of deposition by water, grain size most closely indicates the _____.
- a. average velocity of the water from the time of erosion until deposition
 - b. velocity of the water at the moment the sediment settled into the position in the deposit
 - c. geographic extent of the weathering source rock at the outcrop
- B 9. Spheroidal weathering occurs when _____.
- a. physical weathering predominates and there is little chemical weathering
 - b. chemical weathering attacks corners and edges of rock more rapidly than its interior
 - c. chemical weathering works at a uniform rate throughout the rock
 - d. physical weathering breaks boulders directly into spherical cobbles and pebbles

Earthquakes and Seismology

- C 10. An earthquake recurrence interval for a given segment of a fault is _____.
 a. a place where the fault moves without seismicity (by fault creep); this interval is also known as a seismic gap
 b. the time between the arrival of the P-waves and S-waves on a seismograph; this interval is used to measure the distance between the seismograph and the earthquake
C c. the average time between successive earthquakes on the fault segment
 d. the overall accumulation of slip on the fault segment over a specified interval
- D 11. If, during an earthquake, a footwall slides upward relative to a hanging wall, and if the fault plane is steep, the fault is referred to as a _____ fault.
 a. reverse b. strike-slip c. thrust D d. normal
- C 12. Long-term prediction of earthquake behavior _____.
 a. works on the principle that fault slip is like clockwork and earthquakes occur at very regular intervals
 b. is based on the occurrence of foreshocks
C C c. includes the accounting for "seismic gaps"---places where an earthquake is overdue
 d. all of the above
- C 13. Which of the following media will transmit seismic energy the fastest?
 a. sedimentary rock C c. igneous rock
 b. water d. sediment
- B 14. A primary force opposing motion on all faults is _____.
 a. Van der Waal's force
B B b. friction
 c. magnetic attraction among iron-rich minerals
 d. gravity
- C 15. Which of the follow statements is (are) most accurate regarding tsunamis?
 a. A tsunami is a rhythmic sloshing of water back and forth within a lake, bay, or harbor.
B B C b. A tsunami is an earthquake-generated sea wave that can destroy coastal cities thousands of kilometers from the earthquake source.
 c. Tsunami is the tendency of wet, clay-rich soils to behave like a liquid during an earthquake.
- C 16. Which earthquake severity scale takes subjective estimates of damage and shaking into account when estimating the size of the earthquake?
 a. Richter scale
 b. Moho Scale
C C c. Mercalli scale
 d. moment magnitude scale

- A 17. Seismic rays follow curved paths in Earth's interior due to _____.
- gradual changes in density with depth beneath the surface
 - the spheroidal nature of the Earth itself
 - the influence of abrupt changes in density associated with major contrasts in rock type at depth
 - the arcuate nature of trenches at subduction zones, where most earthquakes are generated
- C 18. Medium- and deep-focus earthquakes occur along _____.
- all three major types of plate boundaries
 - transform plate boundaries only
 - convergent plate boundaries only
 - divergent plate boundaries only
- A 19. The intersection between a fault plane and the ground surface is called the _____.
- fault trace
 - seismic interface
 - plunge
 - dip line
- C 20. The point on Earth's surface directly above the point where an earthquake occurs is termed the _____.
- eye of the fault
 - vertex
 - epicenter
 - hypocenter
- C 21. Generally, which type of earthquake waves travel fastest?
- interior waves
 - surface waves
 - body waves
 - R-waves
- D 22. Surface waves _____.
- are the first waves to arrive at a seismograph station after an earthquake
 - are the first waves initially produced in an earthquake
 - travel more rapidly than body waves
 - produce most of the damage to buildings during earthquakes
- D 23. Periods of intermittent sliding on a fault as a result of the release of stress during episodes of displacement, followed by stress buildup to the point that the fault is reactivated is termed _____.
- chaotic faulting
 - thrust faulting
 - reverse faulting
 - stick-slip behavior

Igneous and Volcanic Landscapes and Processes

- C 24. Basaltic lavas _____.
- contain a greater proportion of trapped volatiles than rhyolitic lavas
 - contain more silica than rhyolitic lavas
 - contain more iron and magnesium than rhyolitic lavas
 - are more viscous than rhyolitic lavas
- C 25. Pillow basalts attain their distinctive blob-like shapes because their parent lavas do not travel far prior to solidification. Why?
- Pillow basalts are highly felsic and thus travel slowly.
 - Pillow basalts are ultramafic and thus freeze at exceptionally high temperatures.
 - Pillow basalts erupt underwater and thus cool very quickly.
 - Because pillow basalts are completely devoid of volatiles and thus travel slowly.

- A 26. Continental arc volcanism is associated with _____.
- a. a wide range of eruptive styles, from effusive to explosive
 - b. primarily explosive basaltic eruptions such as those recently generated by Mt. Pinatubo and Mt. St. Helens
 - c. primarily effusive eruptions that produce shield volcanoes and basaltic lava flows
 - d. phreatomagmatic eruptions that produce cindercones and basaltic lava flows
 - e. none of the above

- D 27. Igneous rocks _____.
- a. are formed through the freezing of melt
 - b. can be produced at the surface of the Earth as well as deep below the surface
 - c. are the most common type of rocks within the Earth
 - d. all of the above
 - e. both a and c

- C 28. Under what conditions would you expect to see a phreatomagmatic eruption?
- a. when basaltic lava clogs the chimney and cause back pressure to build into a devastating eruptive force
 - b. when volatiles effervesce prior to eruption, leading to a 'a' lava flows at the surface
 - c. when water is present in or around the magma chamber (where it can turn to steam)
 - d. when a landslide on the side of the volcano allows lava and pyroclastic debris to be ejected laterally as well as vertically from the crater; this occurred in 1980 on Mt. St. Helens

- E 29. Olympus Mons, the largest known volcano, is found _____ and is an example of a _____.
- a. in Greece / shield volcano
 - b. in Greece / stratovolcano
 - c. on Mars / stratovolcano
 - d. on Io, a moon of Jupiter / cinder cone
 - e. on Mars / shield volcano

- C 30. As compared to mafic igneous rocks, felsic igneous rocks _____.
- a. cool and solidify more quickly
 - b. cool and solidify more slowly
 - c. solidify at lower temperatures
 - d. solidify at higher temperatures

- B 31. Of the three primary forms of subaerial volcanoes, _____ consist of a simple, pile of tephra with slopes near the angle of repose.
- a. shield volcanoes
 - b. cinder cones
 - c. stratovolcanoes

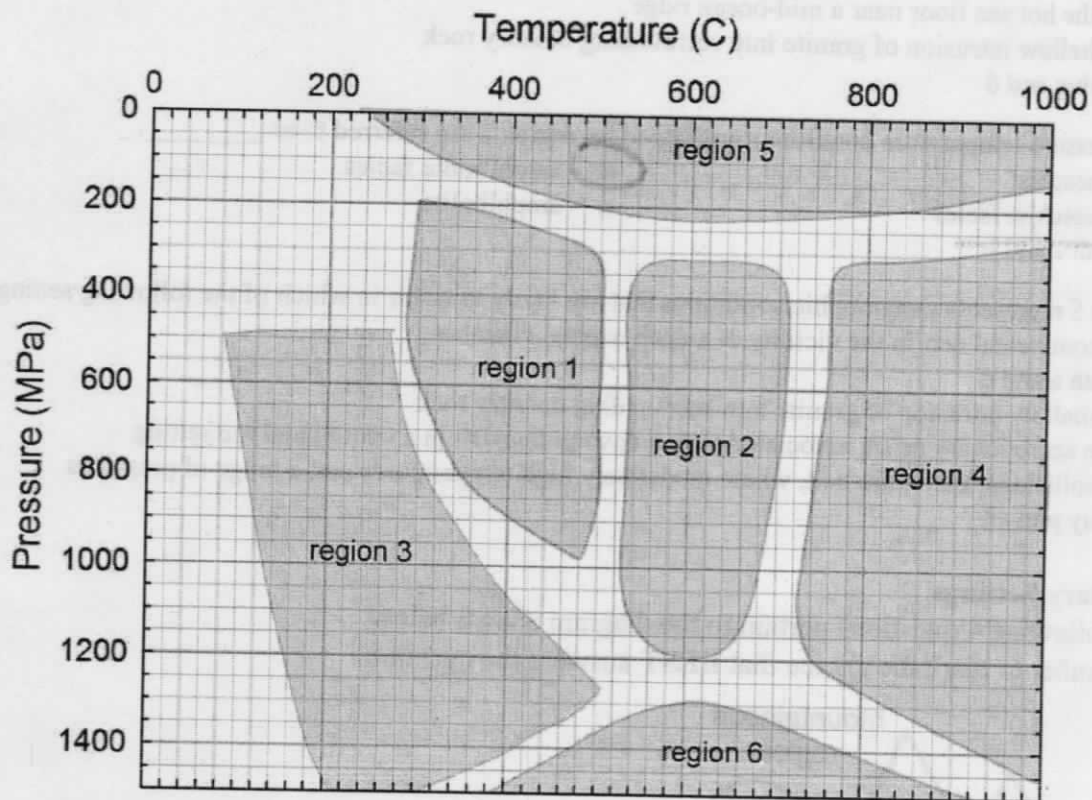
- B 32. When lava crystallizes, _____ are formed.
- a. intrusive igneous rocks
 - b. extrusive igneous rocks
 - c. pyroclastic debris
 - d. volatiles

- C 33. Oceanic hot-spot volcanism is associated with _____.
- a. a wide range of eruptive styles, from effusive to explosive
 - b. primarily explosive basaltic eruptions such as those recently generated by Mt. Pinatubo and Mt. St. Helens
 - c. primarily effusive eruptions that produce shield volcanoes and basaltic lava flows
 - d. effusive eruptions that produce stratovolcanoes and rhyolitic tephra
 - e. both a and d

- D** 34. Volatiles are substances that _____.
- a. crystallize most rapidly out of a melt
 - b. melt immediately upon contact with a hot body of magma
 - c. catch fire when exposed to air
 - D** d. have a tendency to evaporate and are stable as gases
- A** 35. At continental rifts, vast bodies of basaltic lava flow forth from fissures, forming _____.
- A** a. flood basalts
 - b. pyroclastic flows
 - c. ash-fall tuffs
- B** 36. A fast moving flow consisting of a mixture of water and volcanoclastic debris is termed a _____.
- a. glowing avalanche
 - B** b. lahar
 - c. stratovolcano
 - d. flood basalt
- C** 37. Felsic lavas are generally _____ mafic lavas. Gassy lavas are generally _____ lavas that have become degassed.
- a. less viscous than / more viscous than
 - b. less viscous than / less viscous than
 - C** c. more viscous than / less viscous than
 - d. more viscous than / just as viscous as
 - e. more viscous than / more viscous than
- A** 38. A dike is _____.
- A** a. a sheetlike intrusion that cuts across preexisting layers
 - b. a sheetlike intrusion that lies parallel to surrounding layers of sedimentary rock
 - c. a cooled layer of lava
 - d. an intrusion formed within the magma chamber of volcano

Pressure-Temperature Diagram

The following 6 questions relate to the diagram shown below.
Remember to mark the choice that **BEST** answers the question.

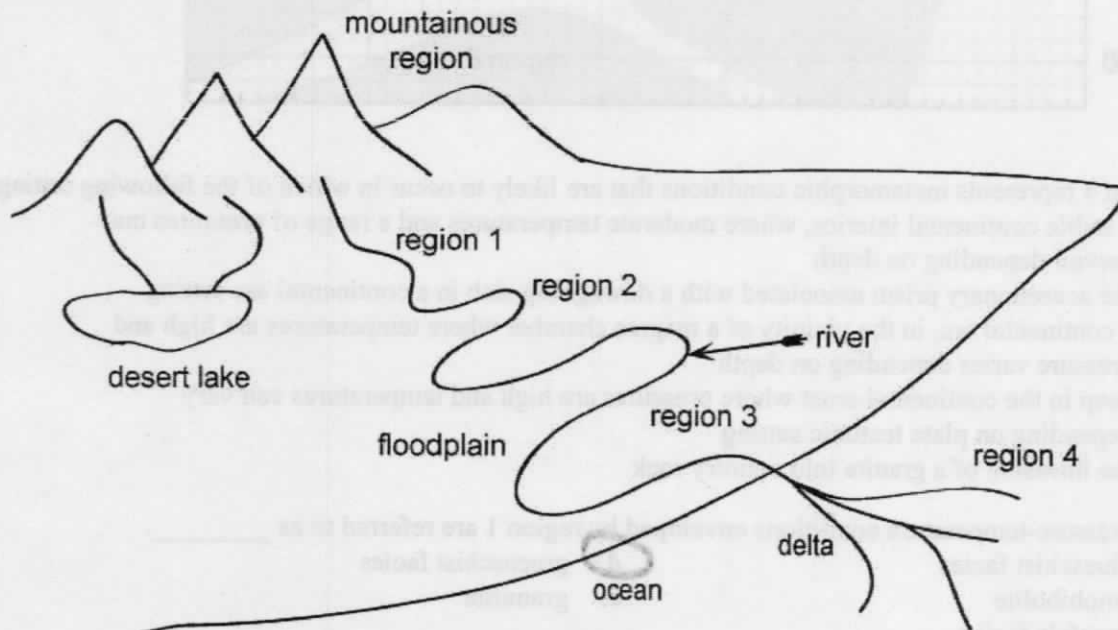


- C 39. Region 4 represents metamorphic conditions that are likely to occur in which of the following settings?
- a stable continental interior, where moderate temperatures and a range of pressures may prevail depending on depth
 - the accretionary prism associated with a downgoing slab in a continental arc setting
 - a continental arc, in the vicinity of a magma chamber where temperatures are high and pressure varies depending on depth
 - deep in the continental crust where pressures are high and temperatures can vary depending on plate tectonic setting
 - the intrusion of a granite into country rock
- D 40. The pressure-temperature conditions enveloped by region 1 are referred to as _____.
- blueschist facies
 - amphibolite
 - hornfels facies
 - greenschist facies
 - granulite
- A 41. The pressure-temperature conditions enveloped by region 3 are referred to as _____.
- blueschist facies
 - amphibolite facies
 - greenschist facies
 - blueschist
 - both a and d

- B** 42. Region 3 represents conditions of metamorphism that are likely to occur in which of the following settings?
- a continental rift zone where hot magma has risen to shallow depth
 - the accretionary prism associated with a downgoing slab in a continental arc setting
 - in the hot sea floor near a mid-ocean ridge
 - a shallow intrusion of granite into surrounding country rock
 - both c and d
- D** 43. The pressure-temperature conditions enveloped by region 2 are referred to as _____.
- blueschist
 - blueschist facies
 - ~~both a and b~~
 - amphibolite facies
 - amphibolite
- C** 44. Region 5 represents metamorphic conditions that are likely to occur in which of the following settings?
- a continental arc, in the vicinity of a deep magma chamber
 - both a and c
 - a shallow intrusion of granite into surrounding country rock
 - the accretionary prism associated with a downgoing slab in a continental arc setting
 - a collisional mountain belt, where moderately high temperatures and a range of pressures may prevail

Sedimentary Settings

The following 4 questions pertain to the diagram shown below.
Remember to mark the choice that **BEST** answers the question.



- E** 45. Which of the following sedimentary rocks is (are) characteristic of deposition in high-energy settings, such as the mountainous region shown in the diagram?
- diamictite
 - quartz sandstone
 - arkose (feldspar-rich) sandstone
 - breccia
 - both a and d

- C 46. Sediment deposited in region 3 of the diagram is likely to be characterized by which of the following types of clasts?
- angular fragments, characteristic of input from the rapidly eroding mountain slopes
 - coarse quartz sand, transported by medium energy flows
 - silt and clay associated with low energy flows
 - cobbles that are well rounded by extensive wear during transport in the river
 - both c and d
- C 47. As sediment travels downstream from region 1 to region 2, one could expect it to become increasingly rich in which of the following minerals, due to chemical weathering of other minerals?
- olivine
 - halite
 - quartz
- C 48. The lake shown in the diagram has 2 inlets but no outlet and is situated in a desert. What type of sedimentary rock is most likely to form as a result of the presence of such a lake in such a setting?
- chert, a biochemical sedimentary rock formed when clams, oysters and snails extract calcium and carbonate from the water to produce a shell
 - travertine, a chemical sedimentary rock that is formed by degassing of CO₂ by water at the surface
 - an evaporite, composed of halite and/or gypsum that precipitates out of the lake water as it evaporates
 - coal, composed of plant detritus that becomes lithified when it is buried deep beneath the surface (under high temperature and pressure)
 - breccia, a clastic sedimentary rock with coarse angular clasts

B Economic Geology

- B 49. Mineral-rich veins within plutons, deposited by hot groundwater into fractures within the rock, characterize _____.
- placer deposits
 - hydrothermal deposits
 - sedimentary deposits
 - residual mineral deposits
- C 50. U-235, the isotope of uranium commonly utilized in nuclear power plants, is _____.
- the most common of the naturally occurring isotopes of U
 - heavier than the other well-known isotope of uranium
 - rare even in uranium oxide deposits, and thus usable as reactor fuel only after it has been extensively enriched
 - none of the above
- C 51. Shale, salt, and fine-grained limestone that is not fractured are all good candidates to serve as _____ within an oil field.
- a source rock
 - a carbonate rock
 - a seal rock
 - a reservoir rock
- C 52. Which fossil fuel, oil or gas, is found at greater depths within Earth, and why?
- oil, because it is more stable at low pressures
 - oil, because it is more stable at high temperature
 - gas, because it is more stable at high temperatures
 - gas, because it is more stable at low pressures

The Rock Cycle

- C 53. The majority of the rocks that occur at the *surface* of Earth are _____.
- a. metamorphic rocks
 - b. intrusive igneous rocks
 - c. sedimentary rocks
 - d. extrusive igneous rocks
- B 54. Clay minerals within a buried body of slate are recrystallized at high temperatures and pressures to form mica, producing a rock called phyllite; this is an example of _____.
- a. diagenesis
 - b. metamorphism
 - c. weathering
 - d. erosion
- B 55. At the surface, potassium feldspar reacts with water to form clay; this is an example of _____.
- a. erosion
 - b. weathering
 - c. metamorphism
 - d. diagenesis
- A 56. Net chemical change in a metamorphic rock induced by reaction with groundwater at temperatures greater than 300 degrees C is termed _____.
- a. metasomatism
 - b. foliation
 - c. weathering
 - d. anachronism

Metamorphic Rocks

- A 57. The development of a preferred orientation of large, flaky mica crystals within metamorphic rock is termed _____.
- a. schistosity
 - b. slaty cleavage
 - c. compositional banding
 - d. phyllitic luster
- D 58. A blueschist _____.
- a. is a metamorphic rock formed at relatively high temperature and low pressure
 - b. is a metamorphic realm of low temperature and pressure
 - c. is a metamorphic realm of high temperature and pressure
 - d. is a metamorphic rock formed at high pressure but relatively low temperature
- C 59. Flattened-clast conglomerate would most likely be found _____.
- a. in an aureole around a cooled igneous intrusion
 - b. within a meteorite impact crater
 - c. at the eroding base of an ancient collisional mountain range
 - d. at depth within the mid-ocean ridge system
- B 60. Rocks resulting from thermal (contact) metamorphism will not possess _____.
- a. silicate minerals
 - b. foliation
 - c. larger crystals than those characterizing the country rock prior to intrusion
 - d. a new mineral assemblage distinct from that found prior to intrusion
- B 61. The region of thermally metamorphosed rock surrounding a cooled pluton is called a(n) _____.
- a. oleo
 - b. aureole
 - c. shear zone
 - d. oriole
- B 62. The mineral assemblage within metamorphic rock is _____.
- a. dependent only on the mineral assemblage of the protolith
 - b. dependent on both the mineral content of the protolith and the temperature and pressure of formation
 - c. dependent only on the temperature and pressure of formation
 - d. always identical to that found within the protolith