

NAME \_\_\_\_\_

Principles of Geology – GEO 102  
Exam 1 – Fall 2007

**PART I (70%) – Individual Portion (BLUE SCANTRON)** Multiple choice (20-pts.) – You will have exactly 20 minutes to complete this portion. Read each question carefully. There is only one correct answer per question. Choose the best answer and write your answer on the line next to the question **AND** fill in the correct letter on the scantron. This is the closed book and non group portion.

**PART II (30%) – Group Portion (RED SCANTRON)** Multiple choice (20-pts.) and Essay (10 pts.)– Once the BLUE SCANTRONS have been collected, you may get into groups and use your notes to retake the exam. NOTE: Please be courteous to your fellow students and try to be as quiet as possible. As mentioned above, there is only one correct answer per question. Although this is a group portion, you may disagree with your group. Choose the best answer by filling in the correct letter on the scantron. When you leave, turn in your **SCANTRON AND THE ANSWER TO YOUR ESSAY**.

1. After wildfires, once vegetated slopes are at a higher risk of mass wasting because
  - A. Gravitational force has increased
  - B. Cohesive forces have decreased because of the loss of the vegetations' roots
  - C. Water acts as a lubricate
  - D. Earthquakes
2. Which of the following statements is **false**?
  - A. Metamorphic rocks may melt to magma.
  - B. Sedimentary rocks may weather to igneous rocks.
  - C. Magmas crystallize to form igneous rocks.
  - D. Igneous rocks can be altered to metamorphic rocks.
3. Mass wasting occurs
  - A. When the cohesion and resistive forces are greater than the downslope force
  - B. When the cohesion and resistive forces are equal to the downslope force
  - C. When the cohesion and resistive forces are less than the downslope forces
  - D. Every weekend at the local watering hole
4. Compression forces associated with convergent boundaries creates
  - A. Fault-block mountains (Basin and Range)
  - B. Volcanic Mountains (Japan)
  - C. Folded mountain chains (Himalayas)
  - D. None of the above
5. With chemical weathering, \_\_\_\_\_ silicate minerals will weather the \_\_\_\_\_.
  - A. single tetrahedron, slowest
  - B. complex, slowest
  - C. complex, fastest
  - D. all, at the same rate

6. As a result of isostasy
- A. As mountains grow, the thickness of the mountain roots increases
  - B. As mountains are eroded, the thickness of the mountain roots decrease
  - C. When 100 meters of material are removed from the mountain surface, the new elevation of the mountain will be less than 100 meters lower.
  - D. When 100 meters of material is added to the mountain surface, the new elevation of the mountain will be less than 100 meters higher.
  - E. All of the above.
7. Anticline is to compressional stress as a reverse fault is to
- A. Academic stress
  - B. Compressional stress
  - C. Shear Stress
  - D. Tensional stress
  - E. None of the above
8. Contact metamorphism is associated with
- A. high temperature and high pressure
  - B. low temperature and high pressure
  - C. high temperature and low pressure
  - D. low temperature and low pressure
  - E. only fluid interaction
9. Mechanical weathering
- A. Changes the composition of the mineral/rock
  - B. Dissolves the mineral/rock
  - C. Increases the surface area on which chemical weathering can occur
  - D. Requires water
  - E. Only happens to igneous rocks.
10. Fluids play an important role in
- A. Weathering
  - B. Metamorphism
  - C. Concentrating elements
  - D. Transporting sediment
  - E. All of the above
11. Which statement concerning sedimentary rocks is NOT true?
- A. All sedimentary rocks contain large clasts derived solely from igneous rocks
  - B. they may contain fossils
  - C. Most are composed of particles and/or chemical constituents derived from weathering and erosion of other rocks
  - D. They may contain structures that reveal the environment in which they were deposited
  - E. They contain most of the world's energy resources.

12. In what geologic setting would you be most likely to find the development of coal?
- A. Fast moving water; streams.
  - B. Slow or stagnate waters; swamps
  - C. Deep water basins; oceans
  - D. Dry windy conditions, deserts.
13. Which of the following would occur in conjunction with a convergent boundary?
- A. Reverse Faulting
  - B. Compression Stress
  - C. Folding
  - D. Regional Metamorphism
  - E. All of the Above
14. While oil and natural gas deposits are found near active tectonic regions, deposits are not found near mid-ocean ridges. Which response provides the best reason?
- A. There is no source rock at a mid-ocean ridge.
  - B. The temperature associated with the underlying magma is higher than the "oil window."
  - C. There is no rock that has enough porosity to serve as a reservoir rock.
  - D. There are no structural traps to collect the oil.
  - E. All of the above
15. Where would you expect to see the greatest amount of chemical weathering
- A. Hot, humid area
  - B. Hot, dry area
  - C. Cold, humid area
  - D. Cold, dry area
  - E. Chemical weathering rates are uniform across the globe.
16. Which of the following is common of clastic and non-clastic sedimentary rocks?
- A. Water was involved in the formation
  - B. Lithification has occurred
  - C. Sediments are involved
  - D. A and B
  - E. All of the above
17. What structure(s) allows hydrocarbons (oil) to accumulate in the Earth's crust?
- A. Anticline
  - B. Syncline
  - C. Faults
  - D. Both A and C
  - E. Both B and C

18. Oil formation begins by the settling of plankton into \_\_\_\_\_ which lithifies to form a \_\_\_\_\_.
- A. Sands; sandstone
  - B. Silts and clays; shale
  - C. Sands; shale
  - D. Silts and clays; sandstone
19. You are in an area with folded sedimentary rock with some steep rock cliffs. The rock is exposed to freeze-thaw cycles. Which process is most likely to occur?
- A. Rockslides
  - B. Debris flows
  - C. Creep
  - D. Slump
  - E. None of the above
20. Which of the following is the most feasible solution for humans to ensure that there are adequate supplies of geochemically scarce elements in the future?
- A. Increase the amount of money for exploration.
  - B. Create a ration system where each country is allotted only a certain amount of an element per year.
  - C. Send exploratory teams to Mars to begin exploitation
  - D. Continue current recycling programs and expand programs to include new materials.

Group Essay Questions **(10 points)**:

NAME: \_\_\_\_\_

TA \_\_\_\_\_

Answer the questions to the best of your abilities. Please be concise but provide detail. This is a group discussion, but you can deviate from your group's response. Where appropriate, draw diagrams.

**You are a silicon-oxygen tetrahedron ( $\text{SiO}_4$ ) currently residing in magma. Discuss what will happen to you as time advances. Be sure to identify and discuss ALL of the possible scenarios.**