

NAME _____

Principles of Geology – GEO 102
Exam 1 – Fall 2005

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 quite 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. At a continental-continental convergent boundary

- A The crust is shortened and thickened.
- B Ophiolite complexes are generated.
- C Volcanoes are numerous and active.
- D Subduction of one of the continents is actively taking place.
- E All of the above.

_____ 2. Which of the following processes will allow for the generation of two igneous rocks with different chemical compositions to form from the same magma?

- A Host rock assimilation
- B Fractional crystallization-Crystal Settling
- C Magma mixing
- D All of the above
- E None of the above

_____ 3. The unifying concept of geology that explains the mechanisms by which the earth's crust is moving is called _____

- A Continental Drift
- B Principle of Superposition
- C Principle of Uniformitarianism
- D Plate Tectonics
- E Principle of Original Horizontality

_____ 4. Granite is to continental crust as

- A magma is to volcanoes.
- B rhyolite is to oceanic crust.
- C basalt is to oceanic crust.
- D andesite is to oceanic crust.

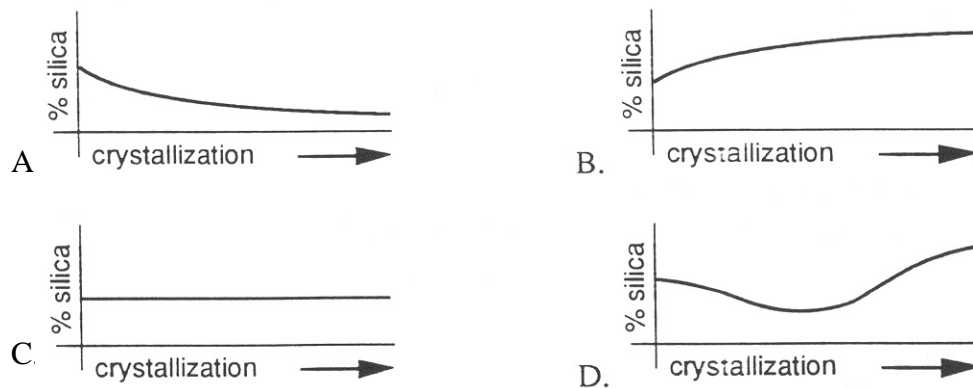
____5. It is possible for granite and rhyolite to have identical chemical compositions. They have different names because

- A they formed at different locations on the earth's surface, one in New York and one in China.
- B they formed from different magmas.
- C they have different amounts of silica.
- D they have different mineral (grain) sizes from different cooling rates.**

____6. A group of water dowsers (people who find water using the pull on a forked branch) argue that they have a high success rate in finding water, but that it only works "if it is tested by believers." Which of the following statements best characterizes this situation?

- A It can be scientifically tested provided the testers are "believers."
- B It can be scientifically tested provided the data are empirical.
- C It cannot be scientifically tested because there would be no test to disprove it.**
- D It cannot be scientifically tested because there would be more than one test to prove it.

____7. The relative silica content (% of silica) in a magma undergoing fractional crystallization would be represented by which of the following graphs?



____8. All silicate minerals contain which two elements?

- A Iron and silicon.
- B Silicon and magnesium
- C Oxygen and silicon.**
- D Oxygen and carbon.
- E Iron and magnesium.

____9. Which of the following is a mineral?

- A Copper (Cu)**
- B Natural gas (CH₄)
- C Coal (C)
- D Liquid Water (H₂O)
- E Plastic

- ____ 10. Continental crust
- A is basaltic
 - B is less than 5 km thick
 - C is generated at Mid-Ocean Ridges (divergent boundaries)
 - D is low density**
 - E is actively subducted at convergent boundaries
- ____ 11. Ionic bonds are to silicon-oxygen tetrahedrons and cations as
- A Metallic bonds are to halite
 - B Ionic bonds are to two silicon-oxygen tetrahedrons
 - C Van der Waal bonds are to cations and anions**
 - D Covalent bonds are to two silicon-oxygen tetrahedrons
- ____ 12. Which of the following would be used to support the hypothesis that the continents were once connected in a giant continent called “Pangea”?
- A The presence of fossils of the same land dwelling reptile on continents separated by oceans.
 - B The geographic distribution of the *Glosseropturis* fossil
 - C The location of similar rocks and mountain chains on continents separated by oceans
 - D The paleoclimatic evidence
 - E All of the above**
- ____ 13. As the complexity of the silicate structure increases
- A the ratio between Si and O (Si:O) becomes smaller (There are fewer Si for every oxygen, i.e. 1:4)
 - B the ratio between Si and O (Si:O) becomes greater (There are more Si for every oxygen, i.e. 1:2)**
 - C more ionic bonds occur within the minerals
 - D A and C
 - E B and C
- ____ 14. P-waves and S-waves
- A move through material at different but constant speeds
 - B can move through liquids
 - C are surface waves
 - D move through material at different speeds that may vary based upon the density of the material**
 - E cannot move through liquid
- ____ 15. Crust generation is to divergent boundaries as
- A Crust generation is to transform boundaries
 - B Crust recycling is to convergent boundaries**
 - C Crust recycling is to transform boundaries
 - D Crust generation is to convergent boundaries
 - E None of the above

_____ 16. The viscosity of magma is dependent on:

- A Iron content
- B Aluminum content
- C Type of eruption
- D Silica content**
- E None of the above

_____ 17. The most abundant gas expelled from lava is

- A Sulfur dioxide
- B Water Vapor**
- C Carbon dioxide
- D Nitrogen
- E Silicon dioxide

_____ 18. Which of the following is **NOT** a major process at divergent plate margins?

- A Ophiolite complexes are created
- B Shallow focus earthquakes
- C Eruption of andesitic magma**
- D Fissure eruptions of basalt
- E The plates are moving away from each other

_____ 19. The density of the Earth is

- A Highest in the Earth's core**
- B Dependent upon the location of the moon.
- C Uniform throughout and is 5.5 g/cm^3
- D Highest in the Earth's crust
- E None of the above

_____ 20. At a transform boundary, energy is stored as two plates moving in opposite directions get caught on each other. When the stress exceeds the threshold of the rock, the rock breaks or ruptures, releasing the stored energy. This process refers to

- A Continental Drift
- B Plate Tectonics
- C Elastic Rebound Theory**
- D Fractional Crystallization
- E Principle of Uniformitarianism

Group Essay Questions (10 points):

NAME: _____

Persons in your Group (must be identified): _____

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.

Using all of your knowledge, compare and contrast an island volcanic arc with a continental volcanic arc. NOTE I expect more of an answer than just what you put for your homework. Realize that this question is worth 10 out of 30 points for the group portion.