

GEOL 101 - Introductory Geology: Exploring Planet Earth - Spring 2011
Test #1 – Feb. 15, 2011

Name KEY **Student ID** KEY

Multiple choice questions (2 points each). Indicate correct answer on scantron sheet. Put your name and student ID on both the test and the scantron. Turn in both the test and the scantron when you are done.

1. The first step in the scientific method is to do what?
a) collect data and observations b) develop a theory c) test a hypothesis d) develop a hypothesis

2. The second step of the scientific method is to develop a _____, which is an idea which explains observations of a geologic process.
a) data set b) theory c) test **d) hypothesis**

3. In the scientific method an explanation for our observations which has repeatedly been tested and has not yet been found to be wrong is a _____.
a) data set **b) theory** c) test d) hypothesis

4. Any explanation for the origin of the solar system must satisfy what observations?
a) all planets orbit the sun in one direction b) axes of rotation are nearly perpendicular to the orbit
c) planets rotate in the same direction as their orbit about the sun **d) all of these**

5. Which of the planets below is a jovian (gas giant) planet?
a) mercury b) venus **c) saturn** d) mars

6. Which of the planets below is a terrestrial (rocky) planet?
a) jupiter **b) mars** c) saturn d) neptune

7. When do we think that the Earth's core formed?
a) very early, soon after accretion b) very recently, perhaps 1 million years ago c) we do not know

8. Initial melting of the Earth was probably caused by:
a) nuclear reactions at the Earth's core b) solar heating by the newly formed sun
c) heating by accretion of planetesimals and then collision with another planetary body

9. The Earth's core is primarily composed of which element?
a) lead b) silicon **c) iron** d) oxygen

10. The lithosphere is:
a) the Earth's crust and immediately underlying mantle b) between the inner and outer core
c) partially molten d) made mostly of iron

11. The Earth's asthenosphere is:

- a) the crust and immediately underlying mantle b) between the core and the mantle
c) **partially molten** d) made mostly of iron

12. The Earth's crust is composed mostly of which element?

- a) **silicon** b) iron c) lead d) potassium

13. At what type of plate boundary are adjacent plates running into each other, with one being subducted and thus destroying crust?

- a) divergent **b) convergent** c) transform

14. At what type of plate boundary are adjacent plates moving away from each other and producing new crust in the process?

- a) **divergent** b) convergent c) transform

15. At what type of plate boundary are adjacent plates sliding horizontally past each other without producing or destroying crust?

- a) divergent b) convergent **c) transform**

16. Which of these is an example of a divergent plate margin?

- a) the San Andreas fault b) the western margin of South America
c) **the mid-Atlantic ridge**

17. Which of these is an example of a convergent plate margin?

- a) the San Andreas fault **b) the western margin of South America**
c) the mid-Atlantic ridge

18. Which of these is an example of a transform plate margin?

- a) the San Andreas fault** b) the western margin of South America
c) the mid-Atlantic ridge

19. _____ are minerals with the same chemical composition but different atomic scale lattice structures.

- a) pseudomorphs **b) polymorphs** c) imposters

20. The basic structural unit of the most abundant minerals on Earth is:

- a) $(\text{CO}_3)^{2-}$ **b) $(\text{SiO}_4)^{4-}$** c) $(\text{PO}_4)^{3-}$

21. _____ is a tendency for a mineral to break along distinct planar (flat) surfaces.

- a) luster b) fracture c) weakness **d) cleavage**

22. The most abundant minerals in the Earth's crust are the _____.

- a) sulfates **b) silicates** c) carbonates d) phosphates

23. The silica tetrahedron has a silicon atom surrounded by:

- a) 2 oxygens **b) 4 oxygens** c) 6 oxygens

24. _____ is an example of the isolated (single) tetrahedra silicates.
 a) muscovite **b) olivine** c) pyroxene d) biotite
25. _____ is an example of the single chain silicates.
 a) muscovite b) quartz **c) pyroxene** d) biotite
26. The carbonates are an important group of minerals which are based on which anionic complex?
 a) $(\text{CO}_3)^{2-}$ b) $(\text{SiO}_4)^{4-}$ c) $(\text{PO}_4)^{3-}$
27. Which mineral below is most common in the more felsic rocks such as granites?
 a) **quartz** b) pyroxene c) olivine d) amphibole
28. Which mineral below is most common in the more mafic rocks?
 a) quartz **b) pyroxene** c) muscovite d) potassium feldspar (orthoclase)
29. Which of the minerals below is an example of the sheet silicates?
 a) **muscovite** b) olivine c) pyroxene d) quartz
30. Which magma type has the highest gas (volatile) content?
 a) mafic b) intermediate **c) felsic (silicic)**
31. An igneous rock formed simply by fast cooling (e.g. a lava flow) would have what texture?
 a) **aphanitic** b) phaneritic c) porphyritic
32. An igneous rock formed by slow cooling at first, with larger crystals starting to grow, followed by eruption to the surface and fast cooling would have what texture?
 a) aphanitic b) phaneritic **c) porphyritic**
33. An intrusive igneous rock such as a granite would have what texture?
 a) aphanitic **b) phaneritic** c) porphyritic
34. Basaltic, andesitic, and rhyolitic magmas are characterized by approximate SiO_2 abundances of (in order as listed):
 a) 70, 80, and 90 % b) 40, 50, and 60 % **c) 50, 60, and 70 %**
35. The gases dissolved in magmas:
 a) are mostly H_2O b) drive volcanic eruptions **c) both of these are true**
36. The viscosity (thickness) of magmas vary from low to high in what order?
 a) mafic, felsic, intermediate **b) mafic, intermediate, felsic** c) felsic, mafic, intermediate
37. Which types of eruptions have the capacity for being the most explosive and dangerous?
 a) basalt **b) rhyolite** c) andesite

38. Rhyolite is _____ when compared to granite.
a) higher in SiO₂ b) lower in SiO₂ c) larger in mineral grain size **d) smaller in mineral grain size**
39. Which of the following igneous rock types are chemically equivalent?
a) andesite and gabbro **b) basalt and gabbro** c) rhyolite and diorite
40. Which of the following igneous rock types are chemically equivalent?
a) andesite and rhyolite b) basalt and granite **c) rhyolite and granite**
41. Which of the following igneous rock types is a mafic composition rock?
a) andesite **b) basalt** c) rhyolite
42. Which of the following igneous rock types is an intermediate composition rock?
a) andesite b) basalt c) rhyolite
43. Which of the following igneous rock types is an felsic (silicic) composition rock?
a) andesite b) basalt **c) rhyolite**
44. _____ has quartz, potassium feldspar, and biotite, and would have a phaneritic texture?
a) basalt **b) granite** c) andesite d) rhyolite
45. Which of the following might be examples of common minerals in a basalt?
a) olivine b) quartz c) potassium feldspar d) muscovite
46. Andesite eruptions commonly produce what type of volcano?
a) cinder cones **b) composite cones** c) shield volcanoes
47. Basalt eruptions commonly produce what type of volcano?
a) lava domes b) composite cones **c) shield volcanoes**
48. Rhyolite eruptions commonly produce what type of volcano?
a) lava domes b) composite cones c) shield volcanoes
49. A rock formed from consolidated pyroclastic material would be called what?
a) clastic b) porphyritic **c) tuff** d) gabbro
50. Mt. Fuji in Japan is a classic example of what type of volcano?
a) a lava dome **b) a composite cone** c) a shield volcano