GEOL1010 Hour Exam 1 21 Sept., 2009

(Yellow test question numbers in parentheses)

1.(6) In the scientific method, an observation in the laboratory or field is considered reliable (fact) if it is
a) consistent with previous hypotheses *b) consistent with the prevailing theory*
c) repeated by independent investigators *d) made by a reputable scientist*
e) approved by the Office of the Scientist General

2.(7) The outermost rock layer of the solid Earth that is about 7km thick in the ocean basins and about 30 km thick in the continents is called the:
a) asthenosphere *b) mantle* **c) crust** *d) lithosphere* *e) core*

3.(8) The layer in the Earth that undergoes brittle fracture to produce earthquakes and is about 80 km thick in the ocean basins and about 120 km thick in the continents is called the:
a) asthenosphere *b) mantle* *c) crust* **d) lithosphere** *e) core*

4. (9)The region in the Earth's interior that undergoes plastic deformation to allow the continents to move without breaking up is called the:
a) asthenosphere *b) mantle* *c) crust* *d) lithosphere* *e) core*

5. (10)The Earth's crust composes about what percentage of the total mass of the planet?
a) 0.025% **b) 0.5%** *c) 10%* *d) 33%* *e) 67%*

6.(11) The age of the Earth, as indicated by radiometric dating of meteorite, lunar, and terrestrial rocks, generally believed to be:
a) 10 billion years **b) 4.5 billion years** *c) 545 million years* *d) 40 million years*
e) 7000 years.

7(12). The most abundant element in the core is
a) hydrogen *b) oxygen* **c) iron** *d) silicon* *e) quartz*

8(13). The inner core of the Earth is composed of
a) solid silicate *b) liquid silicate magma* *c) liquid metal* **d) solid metal** *e) olivine.*

9(14). The mantle of the Earth is composed of
a) solid silicate rock *b) liquid silicate magma* *c) liquid metal* *d) solid metal*
e) layers of liquid and solid silicate

10(15). The surface geologic processes on the Earth are mostly driven by an *external* heat engine. The source of energy for this engine is:
a) radioactive decay of U, Th, and K. **b) thermonuclear fusion in the sun.** *c) burning of fossil fuels*
d) thermonuclear fusion in the Earth's core *e) tides driven by lunar gravitation.*

11(16). Relative to continental crust, the oceanic crust is
a) Thick (>20km), old (>1000 Myr), and light (ρ = <2.8 g/cm^3)
b) Thick (>20km), young (<200 Myr) and light (ρ = <2.8 g/cm^3)
c) Thin (<10km), old (>1000 Myr), and dense (ρ = >3.0 g/cm^3)
d) Thin (<10km), young (<200 Myr) and dense (ρ = >3.0 g/cm^3)
e) Thick (>20km), young (<200 Myr) and dense (ρ = >3.0 g/cm^3)

12(17). The west coast of South America is an active plate boundary where the Pacific Plate is being subducted beneath the South American continent and is an example of a:
a) continent-continent convergent boundary **b) ocean-continent convergent boundary**
c) ocean-ocean convergent boundary *d) divergent plate boundary*
e) transform plate boundary

13(18). New ocean crust is being created along the East Pacific Rise. This is an example of a(n):
a) continent-continent convergent boundary *b) ocean-continent convergent boundary*
c) ocean-ocean convergent boundary **d) divergent plate boundary**
e) transform plate boundary

14(19). The number of protons plus neutrons in the nucleus is known as the:
a) atomic number *b) nuclear weight* **c) mass number** *d) ionic charge* *e) ionic weight.*

15(20). A fundamental atomic particle that has an electric charge of zero, a rest mass of 1.67×10^{-24} gm, and forms part of the atomic nucleus is known as a(n):
a) neutron *b) proton* *c) quark* *d) meson* *e) electron*

16(21). Diamond and graphite are different minerals that have the same composition, pure carbon, but different crystal structures. They are known as
a) isomorphs *b) pseudomorphs* **c) polymorphs** *d) polyhedra* *e) tetrahedra.*

17(22). The atomic number of the element hydrogen (H) is 1. ^{2}H is:
a) an atom with one proton and one neutron *b) an ion with a charge of +2*
c) a molecule composed of two atoms of hydrogen *d) an atom of tritium*
e) an atom of helium.

18(23). The atomic number of the element hydrogen (H) is 1. H_2 is:
a) an atom with one proton and one neutron *b) an ion with a charge of +2*
c) a molecule composed of two atoms of hydrogen *d) an atom of tritium*
e) an atom of helium.

19(24). Atoms of the same element with different mass numbers are known as:
a) ions **b) isotopes** *c) molecules* *d) isomers* *e) polymers.*

20.(25) A naturally occurring, homogeneous solid of definite chemical composition and ordered atomic arrangement that is usually formed by inorganic processes is known as a(n)
a) element **b) mineral** *c) rock* *d) crystal* *e) planet.*

21(26). A small, tabular igneous body that has intruded between the layers of sedimentary rocks so that it is conformable (i.e., not discordant) with the sedimentary layers is known as a:
a) aa **b) sill** *c) stock* *d) dike* *e) pluton.*

22(27). The composition of the black igneous rock in the oceanic crust is said to be
a) ultramafic **b) mafic** *c)intermediate* *d) silicic (felsic)* *e) granitic*

23 (28). A rock formed by the processes of melting, cooling, and crystallization is called:
a) igneous *b)metamorphic* *c) hydrothermal* *d) sedimentary* *e) limestone.*

24. (29)A gabbro is the intrusive, coarse-grained compositional equivalent of a:
a) rhyolite **b) basalt** *c) andesite* *d) granite* *e) peridotite.*

25(30). The density of water is 1.00 g/cm^3 (gram per cubic centimeter). Ice floats on water. The density of ice is about:
a) 0.92 g/cm^3 *b) 1.5 g/cm^3* *c) 2.7 g/cm^3* *d) 8.0 g/cm^3* *e)22 g/cm^3*

26(31). The polymerization of SiO_4 tetrahedra in a magma:
a) increases with increasing silica content *b) causes a change of color*
c) causes an electrical discharge *d) is a major cause of earthquakes*
e) causes a rise in pressure..

27(32). Weathering of granitic rocks and transport of the weathering products on the land surface sorts the minerals by:
a) weight **b) grain size** *c) color* *d) density* *e) composition*

28(33). The most abundant rock on the ocean floor is
a) limestone **b) basalt** *c) shale* *d) granite* *e) andesite*

29. (1) A rock formed by solid state recrystallization of sedimentary or igneous rock is called:
a) igneous **b)metamorphic** *c) hydrothermal* *d) sedimentary* *e) limestone.*

30(34). The depositional environment of most conglomerates and sandstones is:
a) continental, non-marine *b) shallow marine* *c) deep-water marine*
d) tropical marine *e) evaporate (arid shallow marine)*

31(35). What is the distinguishing characteristic used to define the terms gravel, sand, silt, and clay:
a) mineralogy *b) rock-type* *c) location* **d) particle size** *e) particle shape.*

32(36). A well-sorted, fine-grained quartz sandstone exhibiting large and extensive cross-bedding was probably deposited in a:
a) alluvial fan *b) lagoon* *c) deep sea abyssal plain* **d) desert** *e) shallow sea.*

33(37). A sedimentary rock composed of angular sand-, pebble-, and cobble-sized particles is a:
a) sandstone **b) breccia** *c) conglomerate* *d)cobblestone* *e)shale*

34(38). The most abundant mineral in shale is:
a) calcite **b)clay** *c) quartz* *d) gypsum* *e)feldspar*

35(39). The most abundant mineral in limestone is
a) calcite *b)clay* *c) quartz* *d) gypsum* *e) limonite*

36(40). The most abundant mineral in marble is
a) calcite *b)clay* *c) quartz* *d) gypsum* *e) limonite*

37 (2). A shale caught in a subduction zone and carried to high pressure at relatively low temperatures would be a:
a) marble *b) eclogite* **c) blueschist** *d) granite* *e) slate*

38(3). Metamorphism that involves significant change of chemical elements is called:
a) gneissic *b) foliation* *c) regional* *d) polymorphism* **e) metasomatism**

39.(4) The high grade metamorphic equivalent of basalt is a rock composed of garnet and pyroxene known as:
a) hornfels *b) granulite* *c) greenschist* *d) blueschist* **e)eclogite**

40.(5) Every mineral or mineral assemblage has a range of temperatures and pressures at which it is the most stable configuration of the elements present. With increasing pressure at constant temperature, such mineral assemblages typically become:
a)cooler *b) coarser* *c) finer-grained* **d) more dense** *e)less dense.*