

GEOLOGY 1C

Prof. John Gibbons

TEST # 3 - SAMPLE QUESTIONS

Volcanism - Analysis of Planetary Geology

True or False

1. Among the several hazards associated with volcanoes, most fatalities are caused by pyroclastic flows.
2. Felsic lavas contain more silica than mafic lavas and, therefore, are more viscous.
3. Most of the gas released by a volcanic eruption is carbon dioxide.
4. A composite volcano is one constructed of alternating layers of pyroclastic debris and solidified lava flows.
5. Mafic lavas which are relatively low in silica tend to be more viscous than silicic lavas.
6. The islands of Hawaii are essentially a series of cinder cone volcanoes.
7. Volcanic eruptions have declined in frequency over the past 1000 years.
8. The more viscous the lava, the more violent the volcanic eruption.
9. Earth is the only major body in the Solar System on which there are active volcanoes.
10. Composite volcanoes tend to be associated with hot spots over mantle plumes.
11. Pillow structures form where lava is extruded underwater.
12. The multitude of craters that have formed on the Earth have been obliterated by erosive processes and the actions of plate tectonics.
13. All of the planets have similar atmospheres.
14. The Moon is essentially a dead world with neither active volcanoes nor plate tectonics.
15. The surface of Venus is exceedingly hot because of the greenhouse effects of carbon dioxide.
16. Meteorites are meteors that survive passage through the Earth's atmosphere.
17. Comets appear to originate from the far-distant Oort Cloud.
18. The size of a planet has little or no influence on its evolution.
19. An astronomical unit is the average distance of the Earth from the Sun.
20. The greenhouse effect explains why the Earth's equator is hot relative to its poles.

Multiple Choice

Test # 3

1. Volcanic debris that is blasted out of a volcano through the air before deposition is called
 1. pyroclastic
 2. hyaloclastic
 3. obsidian
 4. lava
 5. tuff.
2. Hawaii would not exist if it were not for
 1. coral reefs
 2. river erosion
 3. hot spots
 4. meteor impacts
 5. crustal folding.
3. The main island of Hawaii is an excellent example of a
 1. cinder cone
 2. composite volcano
 3. spatter cone
 4. shield volcano
 5. stratovolcano.
4. Shield volcanoes have.....bases and inclined slopes.
 1. broad....steeply
 2. broadgently
 3. narrowsteeply
 4. narrow.....gently
 5. none of these.
5. Occasionally, a volcano will spew large amounts of fine volcanic dust into the high atmosphere. This dust can have the effect of
 1. reducing the sunlight that reaches the Earth's surface, suppressing photosynthesis
 2. reducing the Earth's surface temperature
 3. damaging aircraft that fly through the airborne dust
 4. causing unusual weather patterns
 5. all of the previous answers are correct.
6. The Roman city of Pompeii was destroyed by the eruption in 79 A.D. of what volcano?
 1. Tamboro
 2. Mt. Mazama
 3. Mt. Pele
 4. Mt. Etna
 5. Mt. Vesuvius.
7. Volcanoes whose magma is.....and has a large amount of.....tend to erupt explosively.
 1. very viscousgas
 2. not viscousoxides
 3. very viscouscarbon

4. not viscousgas 5. hotoxygen.
8. If all conditions are similar, a hotter magma tends to be a
 1. more viscous magma 2. less viscous magma 3. stickier magma
 4. more blocky magma 5. more sluggish magma.
9. Large volcanoes with gentle slopes due to the accumulation of low viscosity lava flows are called
 1. shield 2. composite 3. cinder 4. stratovolcano 5. caldera.
10. The most abundant silicic volcanic rock is
 1. basalt 2. rhyolite 3. andesite 4. tuff 5. obsidian.
11. Eruptions of shield volcanoes fed by mafic magma tend
 1. to be violent and potentially dangerous events
 2... to be explosive but short-lived
 3. not to be explosive or particularly dangerous
 4. to result in the expulsion of vast amounts of tephra
 5. to cover the surrounding landscape in ash
12. The most abundant gas emitted by a typical volcano is
 1. carbon dioxide 2. hydrogen sulfide 3. water vapor 4. sulfur dioxide
 5. hydrochloric acid.
13. Submarine volcanic eruptions occur along.....where plates diverge.
 1. the continental rift zone 2. the transform fault zone 3. the subduction zone
 4. the mid-ocean ridge axial rift zone 5. the hemipelagic zone.
14. What formed where North America overrode a portion of the Pacific Ocean floor and was associated with the eruption of Mt. St. Helens?
 1. the continental rift zone 2. the transform fault zone 3. the subduction zone
 4. the mid-ocean ridge axial rift zone 5. the hemipelagic zone.
15. In 1902 the port city of St. Pierre on the island of Martinique was destroyed by a
 1. lahar 2. tsunami 3. poison gas cloud 4. nuee ardente 5. lava flow.
16. Over 35,000 people died because the eruption of Krakatoa in 1883 generated a

1. tidal wave 2. suzuki 3. roller 4. tsunami 5. whitecap.
17. The opening through which a volcanic eruption takes place is termed a
1. caldera 2. vent 3. fumarole 4. crater 5. basin.
18. In order of decreasing grain size (largest first), the size ranges for tephra (ash and dust, bombs/blocks, cinders) are
1. ash and dust, cinders, bombs/blocks 2. bombs/blocks, cinders, ash and dust
3. cinders, ash and dust, bombs/blocks 4. ash and dust, bombs/blocks, cinders
5. cinders, bombs/blocks, ash and dust.
19. The Hawaiians term a lava with a billowy, ropy and smooth surface texture as
1. Pele's hair 2. pahoehoe 3. haleakala 4. poy
5. aa.
20. Several times in Earth's history, vast outpourings of magma covered many thousands of square miles in multiple flows and these singular events were called
1. pillow basalts 2. plateau basalts 3. rift basalts 4. sheet basalts
5. regional basalts.
21. What is the rock type most closely associated with composite volcanoes?
1. rhyolite 2. andesite 3. basalt 4. obsidian 5. granite.
22. Most of the better known composite volcanoes are located
1. in the Ring of Fire 2. in the mid-ocean ridge system 3. in the circum-Pacific belt
4. in the Mediterranean belt 5. some of these choices.
23. Which of the following planets is not a ball of rock?
1. Mercury 2. Jupiter 3. Venus 4. Pluto 5. Mars.
24. Our galaxy is called
1. the Oort Cloud 2. the Kuiper Belt 3. Andromeda 4. the Solar System
5. the Milky Way.
25. How many stars are there in our galaxy?
1. 100 thousand 2. 500 thousand 3. 10 million 4. 100 million
5. 100 billion.
26. According to current astronomical thinking, how old is this universe?
1. almost 4.6 billion years 2. nearly 6000 years 3. nearly 14 billion years

4. almost 1 billion years 5. 575 million years.
27. The internal heat of the Earth and other rocky planets comes from a combination of gravitational energy and
 1. heat from the Sun 2. energy left over from the Big Bang
 3. cosmic rays emitted from the Sun 4. radioactive decay 5. the greenhouse effect.
28. The only planet that radiates more heat into space than it receives from the Sun is
 1. Venus 2. Jupiter 3. Saturn 4. Uranus 5. Pluto.
29. What is the largest planet in terms of mass?
 1. Earth 2. Jupiter 3. Saturn 4. Uranus 5. Neptune.
30. The topography of our Moon is dominated by
 1. volcanic mountains 2. meteor impact craters 3. folded mountain ranges
 4. fault block mountains 5. what was once mid-ocean ridges.
31. The largest single volcanic structure in the entire solar system is found on
 1 the Earth 2. Venus 3. Mars 4. the Moon 5. none of these.
32. The planet that most resembles our Moon is
 1. Mercury 2. Venus 3. the Earth 4. Mars 5. Uranus.
33. The low density of the Moon suggests that it has relatively little
 1. aluminum 2. feldspar 3. iron 4. oxygen 5. silica.
34. What planet can be considered the Earth's sister, i.e. most like the Earth?
 1. Mercury 2. Venus 3. Mars 4. the Moon 5. Jupiter.
35. The abundant oxygen in the atmosphere of the Earth is a product of
 1. plant photosynthesis 2. volcanic eruptions 3. comet impacts
 4. degassing of the early Earth 5. human activity.
36. What planet other than the Earth has polar icecaps?
 1. Mercury 2. Venus 3. Mars 4. Triton 5. Neptune.
37. Why are the satellites of the outer planets relatively low in mass?
 1. they have a large amount of water ice locked up in their composition
 2. they are conveniently hollow balls of rock
 3. the gravity of the outer planets reduces the mass of their satellites
 4. they contain large amounts of nitrogen and helium

5. they have large amounts of aluminum in their composition.
38. Why do the Moon and Mercury lack an atmosphere?
1. they formed from non-gaseous elements
 2. their gravity is too weak to retain gases
 2. they are so cold their atmospheres are frozen
 4. their atmospheres boiled off
 5. their atmospheres are essentially transparent and we can't see them.
39. A celestial object that exhibits a glowing head and tail when viewed at night is called a(n)
1. asteroid
 2. planet
 3. shooting star
 4. meteor
 5. comet.
40. The orbital path of planets around our sun approximates the shape of a(n)
1. circle
 2. parabola
 3. ellipse
 4. irregular curve
 5. none of these.
41. The core of a comet is made up largely of
1. dreams
 2. ice
 3. helium
 4. organic material
 5. hydrogen.
42. Asteroids are seldom spherical because
1. their gravity is too weak
 2. they are constantly colliding with one another
 3. they are made of soft rock that deforms easily
 4. gravitationally they tug at one another
 5. all of these.
43. The four outer giant planets are largely composed of
1. hydrogen
 2. ammonia
 3. carbon dioxide
 4. water vapor
 5. nitrogen.
44. The atmosphere of Venus is dominated by
1. water vapor
 2. oxygen
 3. helium
 4. carbon dioxide
 5. sulfur dioxide.
45. When viewed from Earth, Mars has what distinctive color?
1. violet
 2. blue
 3. red
 4. green
 5. yellow.
46. In order to see the surface of Venus through its immense cloud cover, scientists use
1. radar
 2. infra-red
 3. X-rays
 4. global positioning systems
 5. microwaves.
47. One way that astronomers are able to determine the composition of far distant planets and their satellites is by
1. landing probes on their surface
 2. scholarly estimates
 3. they are all identical to the composition of the Earth's moon

4. analysis of meteors that come from the same regions of space
5. analysis of the sunlight from their surfaces or atmospheres.

48. Most planets and large satellites of planets within the solar system have an interior core of

1. lead
2. uranium
3. silicon
4. magnesium
5. none of these choices.

49. The atmospheres of Venus, Earth and Mars formed by a combination of processes. One

process that did not contribute to the creation of their atmospheres was

1. volcanic eruptions
2. vaporization of comets that struck these planets in youth
3. gases freed from planetessimals out of which the planets formed
4. cosmic dust originating from our sun
5. all these occurrences added atmosphere to the named planets.

50. The early atmosphere of the Earth was rich in carbon dioxide. Where did the CO₂ go?

1. it escaped into space because of the Earth's low gravitational pull
2. it is chemically locked up in the Earth's oceans and carbonate rocks
3. it chemically merged with gases brought in by the giant meteoritic impacts
4. it is frozen in the Earth's polar ice caps.
5. there were no greater amounts of CO₂ in the atmosphere of earlier times than is today.

51. The albedo reading of a planet reflects that planet's

1. "out of roundness"
2. eccentricity of orbit
3. escape velocity
4. ability to reflect light
5. mean distance from the sun.

52. The Earth's escape velocity is approximately

1. 7 miles / sec
2. 25,000 mph
3. 1/5 that of Jupiter's velocity
4. greater than the escape velocity of Venus
5. all of these choices.

53. Knowing the density of any planet would assist you in determining that planet's

1. mass
2. oblateness
3. escape velocity
4. ability to hold an atmosphere
5. all of these.

54. A type of heavenly body that does not originate in or is not part of our solar system is the

1. asteroid
2. meteorite
3. moon
4. comet
5. all originate within the solar system.

55. The force that prevents planets and other objects from flying off into outer space is

1. centrifugal
2. centripetal
3. inertia
4. magnetism
5. gravity.

56. Of all the mass contained within our solar system, the sun contains about
1. 75% 2. 90 % 3. 10% 4. 99% 5. none of these.
57. Astronomers believe that our solar system was formed from
1. masses of dust and gases that formed a nebula
2. portions of a condensed star
3. matter expelled from the sun
4. the gravitational attraction among meteorites traveling together in space
5. a massive accumulation of interstellar rocks and the impact of colliding comets.
58. The nine planets exist in the space they occupy because they have one major consideration
in common.
1. the sun's gravitational strength
2. they all have essentially the same size and mass
3. all planets have the same escape velocities
4. they have within a few degrees the same internal and external temperature
5. none of these.
59. The asteroid belt is located between
1. Jupiter and Mercury 2. Saturn and Uranus 3. beyond the gaseous planets
4. Mercury and the Sun 5. Venus and Mars.
60. The light given off by a comet is the result of
1. its headlong speed in space
2. the friction created by its speed
3. solar radiation that causes the coma to glow
4. a combination of reflected sunlight and fluorescence
5. the internal heat within the core of the comet.
61. The atmosphere of any planet is regulated and determined by its
1. escape velocity 2. gravity 3. oblateness 4. mass 5. all of these.
62. Which of the following planets does not have carbon dioxide in any appreciable amount in its atmosphere?
1. Mercury 2. Venus 3. Earth 4. Mars 5. Ceres.
63. A comet's tail always points away from the Sun because
1. of centrifugal force 2. of the solar winds 3. of the comet's speed in space
4. the tail is made up of different gases than the head 5. all of these.

64. Active volcanoes are concentrated
1. along zones of tension in the lithosphere
 2. along zones of compression in the lithosphere
 3. where the Earth's crust is very thin
 4. only in subduction zones
 5. along both tensional and compressional zones in the lithosphere.
65. Which of the following is not a common volcanic rock type?
1. andesite
 2. basalt
 3. gabbro
 4. rhyolite
 5. none of these.
66. Volcanic calderas are produced by
1. the accumulation of pyroclastic materials
 2. the accumulation of lava extruded from passive margins
 3. massive explosions that destroy the pre-existing cone of the volcano
 4. subsidence following a major series of eruptions
 5. all of these.
67. Large volumes of andesitic lava are extruded
1. along zones of lithospheric separation (oceanic ridges)
 2. along continental rift valleys
 3. along transform plate boundaries
 4. by individual volcanoes within the oceanic plates
 5. where two lithospheric plates converge.
68. Rhyolite volcanoes build much steeper lava cones than basalt volcanoes because
1. rhyolite lava contains less gas than basalt lava
 2. rhyolite lava is richer in silica than basalt lava
 3. rhyolite lava cools more quickly than basalt lava
 4. rhyolite lava is less dense than basalt lava
 5. neither rhyolite nor basalt builds a steep volcanic cone.