

Concordia University

Department of Building, Civil and Environmental Engineering

CIVI231 Geology

Fall 2011

Midterm

October 17, 2011 17:45 – 18:45

Name: [REDACTED]

Student ID: [REDACTED]

Notes:

- Worth 20% of the total course mark.
- Closed book exam, no other sheets than this exam booklet and the supplied answer sheet are allowed.
- Answer questions on the computer readable sheet **only**.
- Good luck!

Name _____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

- ✓ 1) The continental crust is heterogeneous but is predominantly made of _____ and is _____ thick.
A) basalt, 7 km B) granite, 3.5 to 7 km
C) granite, 35 to 70 km D) metasedimentary rocks, 600 km
- ✓ 2) The word "Geology" is derived from Greek meaning _____.
A) rocks form all lands B) the logic of rocks
C) discourse of the Earth D) geographic theology
- ✓ 3) Of the hydrosphere, 97% is contained in _____.
A) lakes and streams B) glaciers
C) groundwater D) the oceans
- X 4) What was Wegener's dramatic paleoclimatic evidence linking all of the southern hemisphere continents between 300 and 220 million years ago?
A) tropical Carboniferous coal swamps across the Northern Hemisphere, particularly the Eastern U.S. and central Europe, where the fossil trees lacked annual growth rings ✓
B) striated and grooved bedrock overlain by Paleozoic tillites in South American and African areas now within 30° of the equator
C) massive reef limestones in Alberta and the Eastern Arctic
D) massive crossbedded red sandstones suggesting former tropical deserts
- ✓ 5) Canada's highest mountain is _____.
A) Mount Waddington in the Coast Mountains of B.C.
B) Mount Rundle in the Canadian Rockies
C) Mount Washington on Vancouver Island
D) Mount Logan 5959 m elevation in the southwest corner of Yukon
- ✓ 6) The northern extension of North America's great Paleozoic Appalachian mountain belt is now found in _____.
A) the Alps of Southern Europe
B) the Caledonides of the British Isles and Scandinavia ✓
C) the Mid Atlantic Ridge north of Iceland
D) the rugged landscape of Western Greenland
- ✓ 7) Which common silicate mineral was used as window glass in the Middle Ages?
A) halite B) quartz C) muscovite D) calcite
- ✓ 8) Which one of the following minerals has the greatest hardness on the Mohs hardness scale?
A) calcite B) topaz C) feldspar D) gypsum
- ✓ 9) The two main types of bonding that form the structures in minerals are _____.
A) radioactive and unstable B) double and triple
C) magnetic and gravitational D) covalent and ionic

- ✓ 10) Which of the following denotes the massive, positively charged, nuclear particles?
 A) neutrons B) electrons ☒ C) protons D) isotrons
- 11) What small, intrusive igneous rock bodies often contain gem-quality crystals of minerals such as beryl and tourmaline and high concentrations of relatively rare elements such as lithium, cesium, and uranium?
☒ A) diorite plutons B) basaltic lavas
 C) granitic pegmatites D) welded tuff sheets
- ✓ 12) In a porphyritic volcanic rock, which mineral grains are the last to crystallize?
 A) pegmatites B) phenocrysts
☒ C) vesicles ☒ D) matrix or groundmass
- ✓ 13) _____ is composed mainly of ferromagnesian minerals.
 A) Andesite ☒ B) Peridotite C) Granite D) Rhyolite
- ✓ 14) Which texture would be most unlikely to occur in an extrusive igneous rock?
☒ A) phaneritic B) aphanitic C) pyroclastic D) glassy
- ✓ 15) Which kind of volcanism is typical of mid-ocean ridge systems?
 A) explosive; composite cones
 B) subversive fissure eruptions and flood basalts
☒ C) explosive; felsic, pyroclastic flows
☒ D) submarine; mafic lava flows
- ✓ 16) Which kind of eruptive activity is most likely to be highly explosive?
 A) lava flows from a large shield volcano on an oceanic island
☒ B) eruptions of big, continental margin, composite cones
 C) lava flows from a large cinder cone complex
 D) fissure eruptions feeding lava to flood basalt accumulations
- ✓ 17) What natural disaster contributed to the disappearance of the Minoan civilization and gave rise to the legend of *The Lost Island of Atlantis* mentioned in Plato's writings?
 A) It washed away in a giant tsunami about 79 A.D.
 B) It was buried by thick ash deposits from Mt. Vesuvius in 79 B.C.
 C) It was obliterated by volcanic dust storms from North Africa in the sixth century A.D.
☒ D) It was buried by thick ash deposits from the volcanic eruption of Thera about 1600 B.C. and sank as the caldera beneath the island collapsed.
- ✓ 18) In which of the following climates would rates of chemical weathering generally be highest?
 A) warm and dry ☒ B) warm and moist
 C) cold and moist D) cold and dry
- ✓ 19) The principal causes of mechanical fragmentation of rocks *in place* are _____.
 A) the relentless actions of Sisyphus
 B) biologic activity, expansion from unloading, frost wedging
 C) always inscrutable because they happened at some time in the past
☒ D) erosion and transport by moving wind, water, or ice

TRUE/FALSE. Write A if the statement is true and B if the statement is false.

- ✓ 31) Because of the nearly 70,000 km of spreading ridges the Earth is gradually increasing in surface area. F
- ✓ 32) The currently accepted age of Earth is approximately 4.6 million years. F
- ✓ 33) There is little feedback or interaction between Earth's various spheres and systems. F
- ✓ 34) The doctrine of uniformitarianism implies that the current forces and processes shaping the Earth have been operating for a very long time. T
- ✓ 35) Rock-forming silicate minerals have higher specific gravities than water. T
- ✓ 36) The external expression of internal atomic arrangement in a mineral is called its crystal habit. T
- X 37) Optically transparent calcite exhibits the special property of "double refraction." F?
- ✓ 38) The large variety of igneous rock types indicates a large number of different primary magmas exist. F
- ✓ 39) Glassy rocks can form either from extremely rapid cooling or high viscosity due to high silica contents. T
- ✓ 40) Crater Lake in Oregon actually occupies a caldera, not a crater. ✓
- ✓ 41) Volcanic earthquakes are often strong enough to destroy buildings. ✓
- ✓ 42) Feldspars commonly decompose during weathering to clay minerals, silica, and soluble constituents. ✓
- ✓ 43) Subduction zones are usually associated with oceanic ridge systems. X
- X 44) The micas, biotite and muscovite, both exhibit one direction of cleavage. X
- ✓ 45) The introduction of water as a flux or decompression are thought to be the main triggers to melt peridotite and generate basalt in the upper mantle. ✓
- ✓ 46) Basalt is the most common magma erupted along oceanic rift systems. X
- ✓ 47) Initially, angular blocks of rock are gradually rounded by the process of spheroidal weathering. ✓
- ✓ 48) The faunal evidence for Pangaea was tenuous as the giant crocodillian, Mesosaurus, could have easily swum from South America to Africa. X
- ✓ 49) Calcite and halite react with dilute acids to evolve carbon dioxide. X



(50) Glassy igneous rocks form when magma cools too fast for mineral grains to grow.

T