

# GEOL1010

# Sample Hour Exam 3

- Oceanic crust is more easily subducted than continental crust because:
  - oceanic crust contains more water than continental crust.*
  - oceanic crust contains less water than continental crust.*
  - oceanic crust is younger than continental crust.*
  - oceanic crust is thinner than continental crust.*
  - oceanic crust becomes much denser than continental crust on subduction.*
- Plate motion is generally believed to be driven by:
  - the solar wind*
  - tidal forces*
  - thermal convection in the solid mantle*
  - thermal convection in the outer core*
  - thermal convection in the crust*
- Ocean-ocean convergent boundaries of tectonic plates are commonly marked by:
  - abyssal plains*
  - deep trenches*
  - submarine canyons*
  - lines of sea-mounts*
  - central valleys of mid-ocean ridges*
- The most abundant rock in the Earth's upper mantle is an olivine-rich, ultramafic rock called
  - granite*
  - gabbro*
  - peridotite*
  - granodiorite*
  - eclogite*
- The lower boundary of the Earth's crust is marked by:
  - a seismic reflector known as the Moho*
  - the low velocity zone*
  - the 400 km discontinuity*
  - the core-mantle boundary*
  - the transition zone.*
- The Earth's mantle is composed of:
  - solid silicate rock*
  - molten silicate(magma)*
  - molten iron metal*
  - solid iron metal*
  - solid granite.*
- The Earth's inner core is composed of
  - solid silicate rock*
  - molten silicate (magma)*
  - molten iron metal*
  - solid iron metal*
  - melted cheese*
- An inclusion of a high pressure rock from a deep source, a so-called 'strange rock', in a volcanic rock is called a:
  - pyroxenite*
  - kimberlite*
  - clinker*
  - ophiolite*
  - xenolith*
- The water of Earth's oceans composes about what portion of the total mass of the Earth?
  - 0.025%*
  - 0.5%*
  - 5%*
  - 20%*
  - 71%*
- The seismic discontinuities at 410 and 660 km depth are thought to be caused by:
  - major faults*
  - poor data*
  - caverns*
  - mineral phase transitions*
  - melting*
- We know that the core is composed predominantly of iron metal because:
  - There is a permanent magnetic field and iron is one of the few ferromagnetic materials.*
  - Iron metal is abundant in meteorites and has about the right density to match that of the core.*
  - Iron metal is abundant in volcanic rocks and has about the right density to match that of the core.*
  - Iron is highly compressible.*
  - Iron metal is a good electrical conductor.*
- Paleomagnetism is the study of:
  - magnetic fossils*
  - the history of the use of the magnetic compass*
  - ancient attractions*
  - the history of the Earth's magnetic field as recorded in rocks*
  - the physics of old magnets.*

13. The Earth's magnetic field is caused by:
- permanent magnetization of magnetic minerals in the crust*
  - permanent magnetization of the solid iron core.*
  - electrical and convection currents in the molten outer core.*
  - the solar wind*
  - electrical currents in the mantle.*
14. We know that the Earth has a molten (liquid) outer core because:
- It erupts as magma periodically.*
  - It "sloshes" giving rise to a rotational wobble.*
  - The outer core does not transmit S-waves.*
  - The outer core shows tidal movements.*
  - The outer core does not transmit P-waves.*
15. For any homogeneous fluid with positive thermal expansion, the rising of warm portions and sinking of cooler portions in a gravitational field is known as:
- conduction*
  - advection*
  - convection*
  - induction*
  - subduction.*
16. The imperceptibly slow movement of unconsolidated soils downslope (commonly indicated by curving tree trunks and non-vertical poles, stakes and grave markers) is known as:
- slump*
  - creep*
  - landslide*
  - debris flow*
  - talus slope.*
17. A movement of a coherent mass of rock and soil a short distance typically along a curved lower surface (such as happened at the intersection of highway 93 and U.S. 6 in Golden) is known as a
- slump*
  - slip*
  - landslide*
  - debris flow*
  - talus slope.*
18. The air-fluidized, high-velocity descent of a mass of debris and/or snow and ice a is known as a(n)
- slump*
  - slip*
  - landslide*
  - debris flow*
  - avalanche.*
19. Which of the following rock types is likely to form the least permeable sediment (aquiclude or aquitard)?
- shale*
  - basalt*
  - limestone*
  - sandstone*
  - fractured granite*
20. In the in a good aquifer in the saturated zone, the pore pressure in the soil or rock is that of the
- atmosphere*
  - water column*
  - rock column*
  - vacuum*
  - ocean floor*
21. Karst topography is characterized by small closed basins, depressions, and underground drainage. The rock that underlies most karst topography is:
- shale*
  - basalt*
  - sandstone*
  - granite*
  - limestone.*
22. The boundary between drainage basins is known as a:
- recharge area*
  - discharge break*
  - knick point*
  - drainage divide*
  - basin rim.*
23. The average elevation fall along a stream bed in ft/mi (U.S.) of m/km (rest of world) is its:
- discharge*
  - flow rate*
  - gradient*
  - drainage basin*
  - slope*
24. If a stream is flowing at an average velocity of 2 ft/s (feet per second) and is 10 ft across with an average depth of 1 ft, its discharge in cubic feet per second (cfs) is:
- 2 cfs*
  - 10 cfs*
  - 20 cfs*
  - 40 cfs*
  - 200 cfs.*
25. A cut off meander in a stream is called a(n):
- point bar*
  - retention pond*
  - oxbow*
  - braid pond*
  - cut-off .*
26. The Colorado River flows into (first encounters salt water at) the:
- Atlantic Ocean*
  - Gulf of Mexico*
  - Pacific Ocean*
  - Gulf of California*
  - Great Salt Lake*

27. The presence of many channel bars in a river (i.e., a braided stream) indicates that:
- a) *the river is actively eroding its bed*
  - b) *the river is flowing up gradient*
  - c) *the river dries up periodically*
  - d) *the river is actively depositing in its bed.*
  - e) *the river has a steep gradient.*

## **Essays**

1. Granite is an igneous rock composed principally of feldspar, quartz, and mica. What are the chemical weathering products of this rock, how are they sorted, and where are they deposited by water transport?
2. What is a 'greenhouse gas' and how does it act to increase global temperatures?
3. How has Earth's climate varied over the past half million years and do we know about the history of the Earth's climate?
4. What is the origin of Earth's magnetic field and how are magnetic reversals recorded by igneous rocks?
5. What is an artesian groundwater system and how does it work?
6. What is a Karst groundwater system and how does it work?
7. What does braiding of a stream channel tell you about the sediment load in a river?
8. What does a narrow V-shape cross section of a river valley tell you about the sediment load in a river?