

Geology 104 Midterm 3 November 2, 2015  
Fifty (50) minute time limit.  
Write your answer to the left of each question

NAME: Evaz Sitz

1 Which volcanic rock consists of hot ash particles that become welded together:

- ~~(a) vesicular basalt~~
- ~~(b) tuff~~
- (c) breccia

2 The albedo of Earth is a measure of:

- (a) the reflectivity of incoming solar radiation
- (b) the greenhouse gas concentration in the atmosphere
- (c) the eccentricity of Earth's orbit around the Sun

3 The Siberian traps are:

- (a) vast accumulations of oil and gas deposits
- (b) diatremes containing mantle fragments including diamonds
- (c) huge outpourings of basaltic lava

4 The geotherm lies at a higher temperature than the melting curve:

- (a) inside the inner core
- (b) inside the mantle
- (c) inside the outer core

5 Post glacial rebound refers to:

- ~~(a) earthquakes caused by the breaking up of sea ice~~
- (b) the recovery of downward warped lithosphere after an ice load is removed
- ~~(c) the emergence of new species in the fossil record after an ice age~~

6 The decomposition of plants and animals by microbes:

- (a) returns phosphorus to the soil
- (b) stores energy as carbohydrates
- (c) withdraws carbon dioxide from the environment

7 The S-wave shadow zone is larger than the P-wave shadow zone because:

- (a) S-waves can not travel through the liquid outer core region
- (b) S-wave velocity decreases with increasing depth into the mantle
- (c) S-waves do not refract at interfaces between different materials

8 Roughly half of the incoming solar radiation is:

- ~~(a) absorbed by the atmosphere~~
- (b) absorbed by the surface of the Earth
- (c) reflected by ice sheets and clouds

9 The movement of a plate over a fixed hotspot generates:

- (a) a trail of progressively older volcanoes
- (b) a collapsed magma chamber and the formation of a caldera
- (c) a fissure eruption like those found at the midocean ridge

10 Offshore seismic oil and gas exploration uses energy provided by

- (a) wind-generated water waves
- ~~(b) seafloor earthquakes~~
- (c) compressed-air explosions

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Earthquakes occur when:

- (a) large ocean waves run up onto the shoreline
- (b) a large blob of magma rapidly rises from the asthenosphere
- (c) an applied stress exceeds the strength of a rock

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The Cambrian explosion refers to:

- (a) the meteorite impact that wiped out the dinosaurs
- (b) huge volcanic outpourings that triggered a mass extinction
- (c) a sudden appearance of new animal families in the fossil record

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The precipitation of magnetite by microorganisms occurs:

- (a) inside the cell walls of certain bacteria
- (b) between layers of sediment in a coastal zone
- (c) on the outer surface of certain bacteria

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A strike slip earthquake produces at surrounding seismographic stations:

- (a) first motions that all show a pull toward the epicenter
- (b) first motions that all show a push away from epicenter
- (c) first motions that may show either a push toward or a pull away from epicenter

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Past global temperatures based on oxygen isotope ratios are recorded by:

- (a) ice cores containing bubbles of ancient atmospheric gases
- (b) the thermohaline circulation of the world oceans
- (c) marine sediments containing shells made of calcium carbonate

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Which provides evidence for the rise of oxygen concentrations in the early atmosphere:

- (a) banded iron sedimentary formations
- (b) the appearance of fungi in the fossil record
- (c) large numbers of trilobites found in marine shales

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A typical seismic record of an earthquake shows:

- (a) surface waves having larger amplitudes than P waves
- (b) surface waves arriving first
- (c) S waves arriving before P waves

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In a seismograph instrument:

- (a) the recording pen is directly attached to the spring
- (b) the drum rotates faster when the Earth moves up and down
- (c) there is a relative motion between the mass and the base plate of the seismograph

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Fluctuations in global climate over periods of one-hundred-thousand years:

- (a) are due to changes in the circulation of the ocean
- (b) are due to changes in the rate of deposition of marine sediments
- (c) are due to changes in Earth's orbit around the Sun

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Which eruptive style shows alternating pyroclastic layers and lava flows:

- (a) a stratovolcano
- (b) a cinder cone
- (c) a shield volcano