

GEOLOGY 171: Earthquakes & Natural Disasters

Final Exam Fall 2012

Instructions: On the bubble sheet, darken the name *and* ID# bubbles; **LEFT JUSTIFY the ID #**. If we have to manually enter your grade due to incorrect darkening of name or ID# bubbles, 3% will be subtracted from your grade for this exam. Also **WRITE in your name and ID#** at the top of the bubble sheet.

There are 125 questions worth 2 points each. Read each question carefully before selecting the best answer. The answer key will be on Blackboard after class.

- Which of the following disasters since 1975 has individually killed more than 150,000 people?
 - earthquake in Haiti in January, 2010
 - earthquake and tsunami in the Indian Ocean in December, 2004
 - earthquake in China in July, 1976
 - all of them**
- One of the first to note similarity of the Atlantic coastlines of South America and Africa was
 - Alfred Wegner
 - Eduard Seuss
 - Francis Bacon**
 - Nicolas Steno
- One pound of a radioactive element is put in a sealed jar. You come back after 4 half-lives of the original radioactive element have elapsed. How much of the original element is left?
 - one fourth of a pound
 - one eighth of a pound
 - one sixteenth of a pound**
 - one thirty-second of a pound
- When an oceanic plate collides with another oceanic plate,
 - both plates are subducted
 - neither plate is subducted, but a high mountain range is formed.
 - the younger plate gets subducted.
 - the older plate gets subducted.**
- Which frequencies of earthquake waves attenuate more slowly?
 - Low frequencies**
 - High frequencies
- Displacement motion on transform faults is mostly _____
 - Vertical
 - Horizontal**
- Which of the following cost the most lives in U.S. history?
 - Hurricane Andrew in 1992 in Florida
 - Galveston hurricane of 1900**
 - Hurricane Katrina in 2005
 - Hurricane Sandy in 2012

8. The continental crust, on average, is about _____ the oceanic crust.
- (a) the same age as and thicker than
 - (b) one tenth as old as and thinner than
 - (c) ten times as old and about 5–10 times thicker than**
 - (d) 5–10 times thicker and much younger than
9. Which of these is not one of the principal natural sources of radioactive heat in the earth?
- (a) Uranium
 - (b) Potassium
 - (c) Thorium.
 - (d) Silicon**
10. The vast majority of motion on the San Andreas fault has been
- (a) vertical
 - (b) horizontal**
11. As an observer moves away from the oceanic ridges, the seafloor generally _____.
- (a) becomes progressively shallower.
 - (b) becomes progressively older.**
 - (c) becomes progressively younger.
12. Production of radioactive heat within the Earth
- (a) was larger a billion years ago than it is now**
 - (b) has remained constant through time.
 - (c) is larger now than it was a year ago
 - (d) keeps increasing exponentially with time.
13. Earthquakes occur to depths of _____.
- (a) as much as 700 km (430 miles)**
 - (b) as much as 1500 km (890 miles)
 - (c) only about 20 miles
 - (d) as much as 2900 km (1800 miles)
14. Motion in _____ waves is retrograde elliptical and motion in _____ waves is side-to-side.
- (a) Rayleigh; Love**
 - (b) Love; Rayleigh
 - (c) P; S
15. You invest \$1000 at a compound interest rate of 10%. You will have \$2000 in _____ years.
- (a) 10
 - (b) 7**
 - (c) 5
 - (d) 2
16. In a series of earthquakes that includes foreshocks, a main shock, and aftershocks,
- (a) foreshocks are immediately recognized before the main shock occurs.
 - (b) foreshocks are only recognized as such sometime after the main shock has occurred.**
 - (c) foreshocks are always larger than the aftershocks.

17. The Richter Scale magnitude is a direct measure of which of the following?
- (a) Distance to the spot where faulting occurred
 - (b) Total seismic energy released by the earthquake**
 - (c) Local geology
 - (d) Duration of the faulting process
18. Using the S-P timing method, epicenters can be narrowed to two possible locations using seismograms from a minimum of ___ stations, whereas a unique location requires ___ stations.
- (a) three; four
 - (b) two; three**
 - (c) three; three
 - (d) four; five
19. The idea that in an un-deformed sequence of sedimentary rock layers, the younger rocks are on top is the principle of _____.
- (a) Uniformitarianism
 - (b) Superposition**
 - (c) Original Horizontality
20. We know of the presence of the earth's liquid core because of
- (a) the disappearance of S-waves at distances more than 103 degrees from earthquakes**
 - (b) the effects of gravity.
 - (c) the behavior of seismic surface waves.
21. Rapa Nui (Easter Island) is located in the
- (a) Atlantic Ocean
 - (b) Indian Ocean
 - (c) Mediterranean Sea
 - (d) Pacific Ocean**
22. If Hawaii's Big Island was instantaneously placed on an oceanic plate one immediate result would be
- (a) the crust would not be in isostatic equilibrium**
 - (b) increase in volcanic activity elsewhere on Earth
 - (c) the surrounding plate will rise significantly
 - (d) volcanic activity would be induced on the opposite side of the Earth
23. The Pacific plate is being created mostly on its _____ side and destroyed mostly on its _____ side.
- (a) Northwest; southeast
 - (b) Southeast, northwest**
 - (c) Northeast; southeast
24. How long does an earthquake P-wave take to go all the way straight through the earth, a distance of about 8000 miles?
- (a) 20 seconds
 - (b) 2 minutes
 - (c) 22 minutes**
 - (d) Several hours
 - (e) 2 days