1. The magnitude of an earthquake can be determined from seismograph records. The information needed to do this includes.

A. the time of the quake
B. the frequency of the waves
C. the amplitude of the waves
D. the type of fault motion

2. S-P wave time intervals can be used to determine the
A. distance to an epicenter
B. magnitude of a quake
C. the frequency of waves
D. both A and
E. none of the above

3. Gravity anomalies
A. is a german heavy metal band
B. occur during magnetic reversals
C. are strictly high values of gravity
D. can be related to crustal thickness

4. Earthquakes are caused by
A. the high strain rates associated with ductile deformation
B. the sudden release of elastic strain energy stored in rocks.
C. abrupt changes in the geothermal gradient
D. the sudden breaking open of large rifts in the Earth's crust.

5. Along convergent plate boundaries, earthquake foci
A. are located along inclined zones with the deepest quakes nearest the trench
B. are located along inclined zones with the most shallow quakes nearest the trenchC. are all shallow
D. are all deep

6. Along oceanic ridges and continental rifts, earthquake foci
A. are all deep (>400Km)
B. are all shallow (< 100 KM)
C. are located along inclined zones with the most shallow quakes nearest the ridge or rift center D. are between 100 and 200 km deep

7. The October, 1989, Loma Prieta earthquake in the San Franciso/Oakland area was a
A. shallow quake
B. intermediate depth quake
C. deep,quake

8. This 1989 quake had a magnitude of 7.0. The amount of energy released during this quake was less than that released in the magnitude 8, quake that struck Alaska in 1964 by a factor of
A. 0.1
B. 8/7
C. 30
D. 1000
E. 2

9.In the case of both earthquakes mentioned above, the damage to buildings was greatest in areas
A. built on unconsolidated sediments
B. built on metamorphic rocks
C. built on high ground
D. built on low ground
E. with cable TV

10. Which of the following has not been considered evidence for continental drift?
A. the apparent continuation of certain large structures such as the Appalachian mountain chain from one continent to another.
B. the simultaneous (with regard to geologic time) occurrence in the fossil record on different continents of certain land animals C. Rocks of the same age on different continents show the same history of magnetic reversals.
D. the apparent good fit of the margins of continents on either side of the Atlantic Ocean

11. Which of the following mountain belts was not formed by continental collision?
A. Andes
B. Appalachians
C. Himalayans
D. Urals

12. Devonian age (360 million years old) volcanic rocks in Nova Scotia have magnetic inclinations between 0 and 6 degrees..This might be interpreted to indicate that during the Devonian
A. the magnet field was very weak
B. Nova Scotia was closer to Europe
C. Nova Scotia was much closer to the north pole than it is now.
D. Nova Scotia was much closer to the equator than it is now.

13. In old mountain belts, the suture, or line that marks the boundary along which colliding continents became joined can be approximately located by careful study of certain geologic features. Which of the following features are not useful'for this?
A. cross bedded sandstone
B. ophiolites
C. fossil assemblages
D. melanges

14. The active ridges are the highest areas of the ocean basins because
A. They are the oldest
B. They are highly folded
C. They contain the thickest accumulation of sediments
D. They are the warmest
E. The crust there is basaltic and thus less dense

15. The age of the crust of ocean basin
A. increases with increasing distance from the ridges
B. decreases with increasing distance from the ridges
C. is everywhere older than continental crust
D. A and C

16. Subduction is a process by which oceanic crust and lithosphere is recycled into the asthenosphere.This subduction always occurs along A. oceanic ridges B. oceanic trenches C. transforms D. Rifts

17. In which of the following materials is the velocity of P waves the greatest? (hint: disregard differences in densities) A. clay B. water C. air D. steel E.rubber

18..In which of the materials above do P waves travel with the slowest velocity? (hint: disregard differences in densities) A. Water

19. Methods to monitor the buildup strain along earthquake generating faults is one attempt at forecasting. These methods include
A. the use of strain meters D. all of the above
B. careful surveying across faults E. none of the above
C. measuring ground level

20. Evidence that the Earth's outer core is liquid i
A. The temperature is too high for solids to exist
B. The density is too low to be a solid
C. It is too compressible to be a solidD P wave velocities are too high
E. S waves are not transmitted here

21. Which region of the Earth is the most rigid when subjected to rapidly applied stresses (such asduring passage of S waves)? A. atmosphere B. upper mantle C. crust D. lower mantle

22. The significant difference between the lithosphere and the asthenosphere is mechanical behavior and this difference is due to a difference in A. composition B. age C. temperature D. water content

23. Earthquakes do not originate in the asthenosphere because
A. the asthenosphere yields to long term stress by flowing and can not accumulate elastic strain
B. the asthenosphere is too dense to transmit seismic waves
C. the asthenosphere is basically brittle and thus can not transmit shock waves
D. The Mg and Fe contents are too low

For items 24 through 32 select one of the following regions of the Earth

A. crust B. core C. upper mantle

24. It contains the asthenosphere Upper Mantle
25. it is entirely within the lithosphere Crust
26. is believed to be the source of the Earth's magnetic field Core
27. composed largely of peridotite Upper Mantle
28. source of diamond-bearing kimberlites Upper Mantle
29. believed to be similar in composition to metallic (Fe-Ni) meteorites Core
30. lies above the mohorovicic discontinuity Crust
31. where rocks can retain a permanent magnetization Core
32. where partial melting that produces basaltic magmas occurs Upper Mantle

For items 33 - 38, select one of the following geographic areas

A. Florida B.Rocky Mountains C. Hawaiian Islands

33. depth to the Mohorovicic discontinuity is 45 to 50 km Rock Mountain
34. depth to the Mohorovicic discontinuity is 30 km Hawaiian Island
35. depth to the Mohorovicic discontinuity is 6 to 8km Florida
36. there are no significant gravity anomalies Florida
37. gravity anomalies are strongly positive Hawaiian Island
38. gravity anomalies are strongly negative Rock Mountain

For items 39 through 63 choose A (true) or B (false)

39. Earthquakes occur only in the lithosphere. True
40. Some earthquakes have foci greater than 400 km deep. True
41. The lithosphere is approximately I 00 km thick. True
42. Some earthquakes originate in the asthenosphere. False
43. The region of the East African rift zone and the Red Sea is an example of a continent in the early stages of breaking apart True
44. Concrete and brick buildings are more likely to be damaged during earthquakes than are steel and wooden buildings. True
45. All large earthquakes are centered along plate boundaries True

46. All centers of volcanic activity are located along plate boundaries. True

47. While lithospheric plates move, plate boundaries must remain nearly stationary. False

48. Oceanic crust is destroyed by subduction along trenches; continental crust is not subducted, because of its relatively low density, and isostatic forces that keep it standing high. True

49. As a consequence of oceanic crust being continuously destroyed by subduction, while newoceanic crust is produced at ridges, and continental crust being preserved, the oldest rockson Earth occur on the continents. True

50. Tsunamis pose the greatest danger to people living in mountainous regions. False

51. The pattern of magnetic reversals imprinted on rocks of the ocean floors provide some of the strongest evidence for sea-floor-spreading. True

52. Heat in the lithosphere is transferred mainly by convection. True

53. Heat in the mantle is transferred mainly by conduction. True

54. The Earth's crust is thinnest in ocean basins. True

55. A region of the upper mantle is partially melted. True

56. The low velocity zone of the mantle is completely solid, False

57. Peridotite is a major component of the upper mantle. True

58. The thick "roots" of mountain belts are more dense than the mantle they displace. As mountain belts erode away at the top, the size of their "roots" also decrease. True

59 In historic times, no large earthquake has ever occurred in the central region of the USA. False

60. S waves are shock waves and cause most of the damagb during earthquakes. True

62. domestic animals have been used in @earthquake forcasting True

63. During Earthquakes, the tallest buildings suffer more damage than those shorter and made of the same materials. True