GEOL 308: Natural Hazards
Quiz III

Name (last, first): _____ Date: _____
(2 points for each question)

1. The _____ forms the relatively cool, brittle plates of plate tectonics.
A) geosphere B) asthenosphere C) astrosphere D) lithosphere

2. Which is the thinnest Earth layer?
A) Continental Crust B) Oceanic Crust C) Mantle D) Core

3. (10 points) Describe thermal convection. Include the source of heat, where this heat goes, what it does to Earth's materials, and what those materials do. Include information about the two following questions: Why do the Earth materials rise? Why do they fall?

4. What happens to oceanic crust as it gets older, in the correct order?
A) crust cools, becomes more dense, and sinks B) crust becomes more dense and sinks
C) crust gets more dense, cools, and rises D) crust heats, becomes less dense, and rises

5. Which is the most dense?
A) continental crust B) oceanic crust C) core D) mantle

6. Which is the least dense?
A) continental crust B) oceanic crust C) core D) mantle

7. The hotspot-melting-through-lithosphere process forms lines of extinct volcanoes on the ocean floor, from youngest to oldest, _____.

A. pointing in the direction of plate movement
B. in a direction pointing toward the sun
C. pointing in the opposite direction of plate movement
D. with random ages along the lines
E. pointing at 90 degrees to the direction of plate movement

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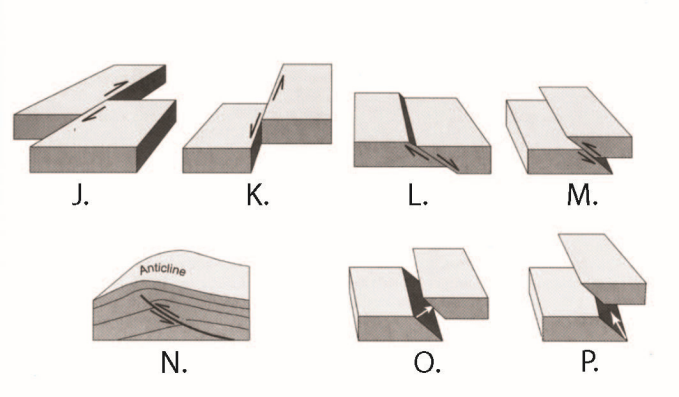
For the next 5 questions use the figure at the right.



8. Which of the following pairs of faults are the results of compressive stresses?

A. K & L
B. M & N
C. J & K
D. none of these

9. Which is a blind thrust fault?

A. O
B. M
C. K
D. J
E. N

10. Which is a right-lateral, strike-slip fault?

A. K
B. O
C. M
D. N
E. J

11. Which of the above choices is a true reverse fault?

A. K
B. O
C. N
D. M
E. J

12. Which of the above choices is a true normal fault?

A. O
B. L
C. K
D. J
E. M

13. The _____ is an example of an active, continent-continent collision.

A. Arabian Peninsula slamming into North Africa under the Red Sea
B. northward movement of India into Eurasia
C. westward movement of the South American plate over the Nazca plate
D. northern movement of Baja California and a sliver of western California toward the Hawaiian Islands

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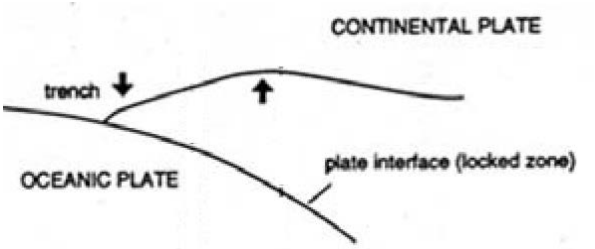
14. What causes earthquakes in San Francisco?

A. Transform faults
B. These are intraplate earthquakes
C. Dip-slip faults from divergent plate boundaries
D. Dip-slip faults from subduction

15. Linear, magnetic patterns associated with mid-ocean ridges are configured as _____.

A. normal and reversed magnetized strips roughly perpendicular to the ridge axis
B. normal and reversed magnetized strips roughly parallel to the ridge
C. concentric circles about a rising plume of hot mantle rocks and magma
D. reversed magnetizations along the rift valleys and normal magnetizations along the ridge

16. Interseismic strain in a subduction zone looks like the drawing at the right.

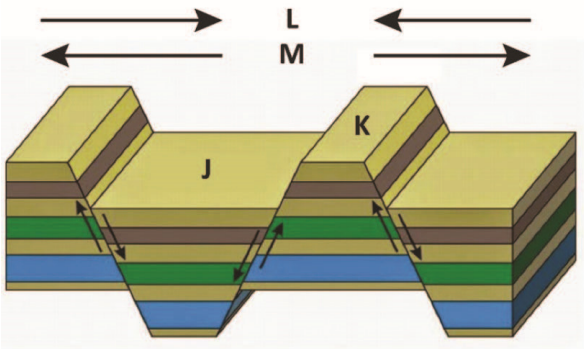


A. True
B. False

17. Vertical motion during a subduction zone earthquake is the opposite from the drawing at the right.

A. False
B. True

For the next 3 questions use the figure at the right.



18. The faulting shown is the result of which tectonic forces:

A. M
B. L

19. The faults shown are called _____ faults.

A. Normal
B. Reverse
C. Thrust
D. Transform

20. The landforms J and K are called _____ and _____

A. Graben, Horst
B. Basin, Range
C. neither A nor B
D. both A and B

21. What happens to oceanic crust as it gets older, in the correct order?

A. crust becomes more dense and sinks
B. crust cools, becomes more dense, and sinks
C. crust heats, becomes less dense, and rises
D. crust gets more dense, cools, and rises

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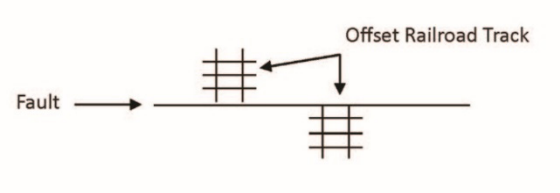
22. The _____ is the compass orientation of the line formed by the intersection of the fault and the horizontal plane. The _____ is measured in cross-sectional view as the angle between the horizontal plane and the fault.

A. dip; dip
B. dip; strike
C. strike; dip
D. strike; strike
E. strike and dip; strike and dip

23. The fault shown in the map view on the right is a



A. dip-slip fault
B. pointing in the direction of plate movement
C. Reverse fault
D. left-lateral, strike-slip fault
E. right-lateral, strike-slip fault

24. The volcanoes and deep valleys of east Africa are related to a _____.

A. transform fault aligned with the Red Sea carrying the Arabian and African blocks in opposite directions
B. continental collision zone between Africa and the Zagros Mountains along the southern margin of Eurasia
C. continental rift along which parts of the African continent are beginning to slowly separate
D. fault allowing Arabia to slip westward past east Africa and penetrate into Turkey

25. The Hawaiian Islands are an example of:

A. Two Continental plates converging
B. Hot Spots
C. Two Ocean plates converging
D. Transform Fault Boundary
E. Diverging plates

26. The Elastic Rebound Theory is made up of four parts. Which of the following is in the correct sequential order?

A. stress, strain, rupture, rebound
B. rebound, rupture, stress, strain
C. stress, rebound, rupture, strain
D. none of these is correct

27. Which of the following energy sources is thought to drive the lateral motions of Earth's lithospheric plates?

A. swirling movements of the molten iron particles in the outer core
B. gravitational attractive forces of the Sun and Moon
C. electrical and magnetic fields localized in the inner core
D. export of heat from deep in the mantle to the top of the asthenosphere

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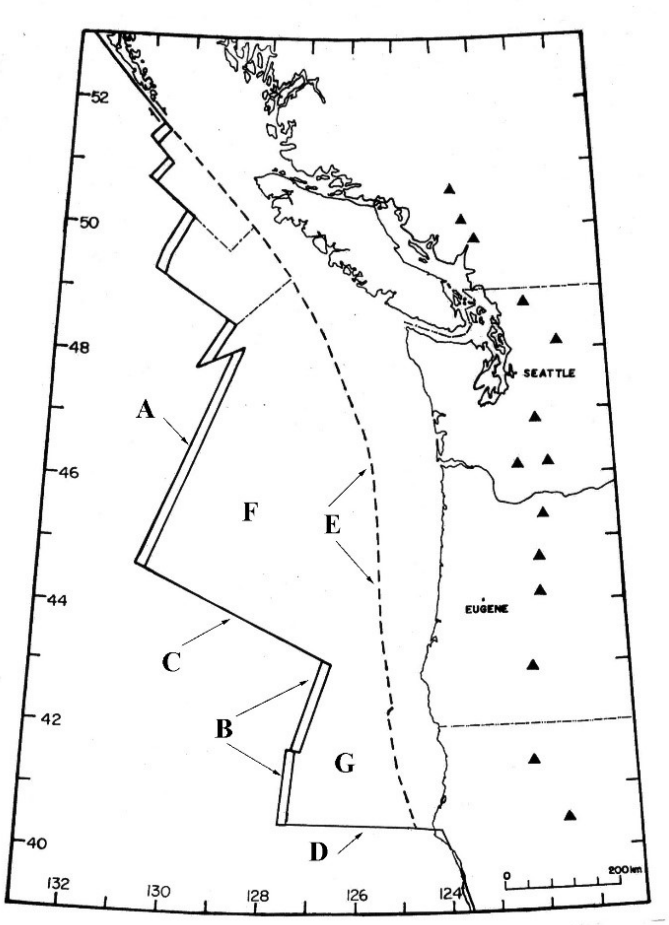
28. The largest earthquake ever recorded by modern instruments (seismometers):

A. Sonora, Mexico, May 3rd, 1887.
B. Alaska, March 27th, 1964.
C. Mexico City, September 9th, 1985.
D. none of the above.

29. What is an example of a convergent plate boundary?

A. San Andreas fault
B. East Africa rift
C. Mid Atlantic Ridge
D. Mariana Trench

For the next 4 questions, use the map at the right.



30. Which is the Cascadia subduction zone fault?

A. A
B. B
C. C
D. D
E. E

31. Which plate boundaries are transform plate boundaries?

A. A, B
B. E
C. C, D
D. G, G

32. Which plate boundaries are divergent plate boundaries?

A. A, B
B. E
C. C, D
D. G, G

33. Which is the Mendocino fault?

A. A
B. B
C. C
D. D
E. E

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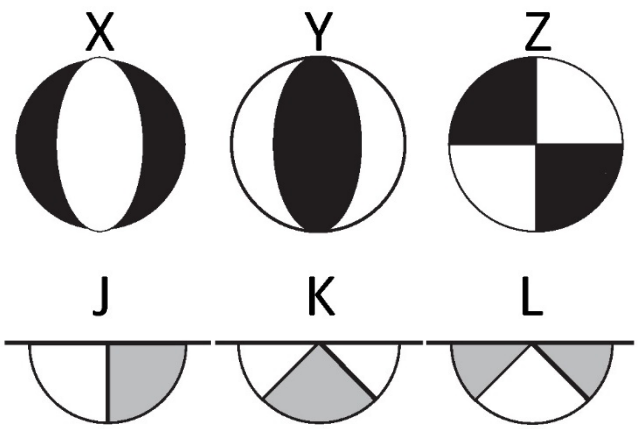
For the next 6 questions, use the diagrams at the right and the previous map.



34. Which is the correct focal mechanism for earthquakes along fault E (ignore the compass orientation of the focal mechanism)?

A. X
B. Y
C. Z

35. Which is the correct focal mechanism for earthquakes along fault D (ignore the compass orientation of the focal mechanism)?

A. X
B. Y
C. Z

36. Which is the correct focal mechanism for earthquakes along fault B (ignore the compass orientation of the focal mechanism)?

A. X
B. Y
C. Z

37. Which is a correct association (which map view beach ball goes with which side view beach ball)?

A. X & J
B. Y & K
C. Z & L
D. X & L
E. Z & K

38. Which represents a normal fault?

A. X
B. Y
C. Z

39. Which represents an earthquake in a convergent margin?

A. K
B. J
C. L

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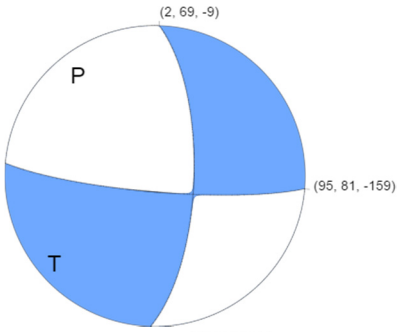
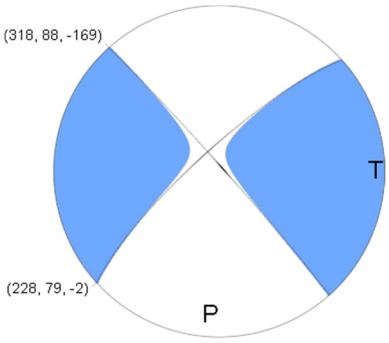
40. Given the moment tensor ("beach ball") to the right, if this were from an earthquake along the Mendocino fault (2016.12.08), what type of an earthquake might this be?



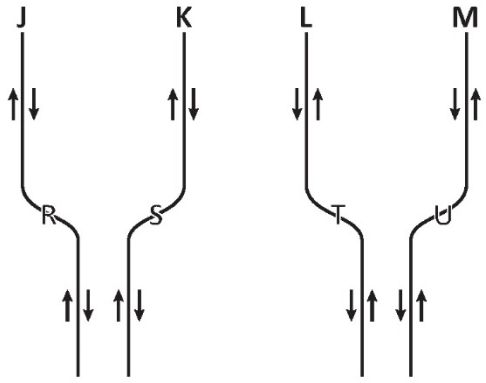
A. dip-slip fault
B. reverse fault
C. left-lateral, strike-slip fault
D. right-lateral, strike-slip fault

41. Given the moment tensor ("beach ball") to the right, if this were from an earthquake in the middle of the Gorda plate (2014.03.10), what type of an earthquake might this be?



A. dip-slip fault
B. reverse fault
C. left-lateral, strike-slip fault
D. right-lateral, strike-slip fault

Use the diagram at the right to answer the next 3 questions.



42. Which strike-slip fault system would generate uplift?

A. J
B. K
C. L
D. M
E. J & M
F. K & L

43. Where would subsidence occur along these strike-slip fault systems?

A. R
B. S
C. T
D. U
E. S & T
F. R & U

44. Which configuration along the San Andreas fault in southern California led to the San Gabriel and Santa Monica mountains?

A. J
B. K
C. L
D. M