

## GEO 1111 : Lecture 8 – Earth Structures and Earthquakes

1) What is strain? What causes strain?

Strain is the amount of deformation an object experiences compared to its original size and shape. The forces that cause deformation of rock are referred to as stresses (Force/unit area).

2) How are joints and faults different?

Joints are fractures in bedrock along which there is NO movement.  
Faults are fractures in bedrock, along which there IS movement.

3) (L) and (R) waves are what types of seismic waves? What is the difference between these two? Which is more likely to topple Parliament?

L & R waves are surface waves and the difference between these two is that L waves move side to side whereas R waves move up and down.  
R waves are most destructive so they're more likely to topple Parliament

4) 90% of earthquakes occur at less than 100 km depth. Why?

As you go deeper into the earth, the pressure + temp is higher and rocks are more ductile.  
Earthquakes occur when rocks break, and thus only occur when rocks are brittle.

5) In an area that might have tsunamis, would it be more dangerous to live near a coastal region with shallow coastal waters or deeper coastal waters (provided you want to live in an area where tsunamis are a hazard)? Why?

When the tsunami enters shallow coastal waters, its speed decreases and the wave height increases. This creates the large wave that becomes a threat to lives and property.

6) Which best contributes to ductile deformation of rock?

- a) High pressure and low temperatures
- b) High confining pressure and low temperatures
- c) High temperature and high extensional forces
- d) Low temperature and low confining pressure
- e) High confining pressure and high temperature

7) A region of down-dropped hangingwalls will have most likely formed by:

- a) Normal faulting
- b) Reverse faulting
- c) Strike-slip faults
- d) Elastic rebound
- e) Thrust faulting

- 8) A rock that ruptures during deformation is said to behave:
- a) Plastically
  - b) Brittlely
  - c) Elastically
  - d) Ductilely
  - e) Rapturely
- 9) The source location of an earthquake is called the:
- a) Epicentre
  - b) Orthocentre
  - c) Hypocentre
  - d) Seismocentre
  - e) Rupture centre
- 10) How much larger is a Richter magnitude of 5 than a magnitude of 2?
- a) 100x amplitude and 33x energy
  - b) 1000x amplitude and 35937x energy
  - c) 100x amplitude and 1089x energy
  - d) 3x amplitude and 3x energy
  - e) 10x amplitude and 33x energy