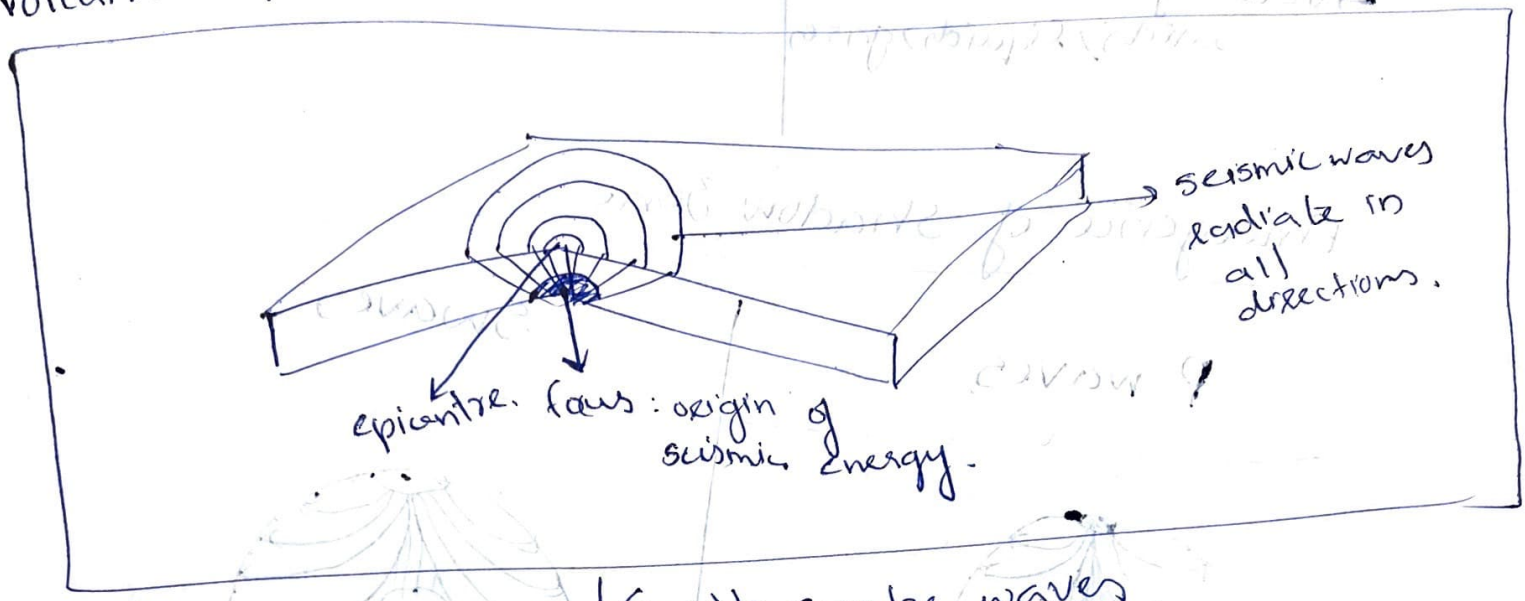
Discuss various types of earthquake waves and explain the formation of shadow zones.

Earthquake waves / seismic waves are waves of energy that travel through the earth's layers as a result of sudden movements like earthquakes, volcanic eruptions or human made explosions.



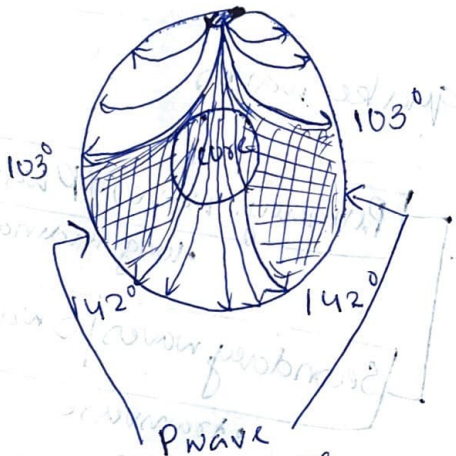
Type of seismic waves / Earthquake waves

- Body waves
  - generated due to release of energy at the focus.
  - move in all directions.
  - Primary waves / P waves
    - longitudinal
  - Secondary waves / S waves
    - transverse
- Surface waves
  - generated by interaction of body waves with surface rocks.
  - most destructive.
  - Love waves
    - fastest
  - Rayleigh waves
    - Rolls along the ground.
    - most of shaking of damage

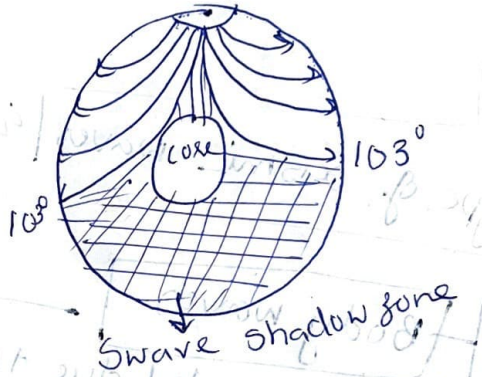
P waves	S waves
→ recorded first on seismograph → least destructive → high frequency → can travel in all mediums → velocity solids > liquids > gases	→ they distort the medium → high frequency → slightly higher destructive → cannot pass through fluids.

Emergence of shadow zone

P waves	S waves



→ P waves are refracted between semi solid mantle & liquid outer core.
→ Thus shadow zone of P waves appears as a band around earth between 103° & 142° away from epicentre.



→ S waves do not travel through liquids thus entire zone beyond 103° does not receive S waves → Shadow zone
→ This observation led to the discovery of liquid outer core

Seismic waves are not just indicators of earthquakes but powerful tools that helps us decode the mysteries lying deep beneath the earths surface.