

Volcanoes & Earthquakes – SSC Notes

1. Volcanoes

Definition

- **Volcano:** Vent in Earth's crust through which magma, gases, and ash escape to the surface

Structure of a Volcano

- **Magma Chamber** → Underground reservoir of molten rock
- **Vent / Crater** → Opening through which magma erupts
- **Cone / Mountain** → Built up by layers of lava, ash, and cinders
- **Lava Flow** → Molten rock after eruption
- **Ash & Gas Cloud** → Released during eruption

Types of Volcanoes

1. **Active** → Erupts frequently → Example: Mount Etna (Italy), Mount Stromboli
2. **Dormant** → Currently inactive, may erupt in future → Example: Mount Fuji (Japan)
3. **Extinct** → No eruption in historical times → Example: Lonar crater (India)

Types Based on Shape

- **Shield Volcano** → Broad, gentle slopes → Lava flows easily → Hawaii
- **Composite / Stratovolcano** → Steep, explosive → Layers of lava & ash → Mount Fuji
- **Cinder Cone** → Small, steep → Ash & cinder build up → Paricutin

Volcanoes in India

- **Barren Island (Andaman Sea)** → Only active volcano in India
- **Narcondam Island** → Dormant volcano

Causes of Volcanoes

- **Tectonic plate movement** → Divergent / Convergent boundaries
- **Hotspots** → Magma rises through crust → Island chains

2. Earthquakes

Definition

- **Earthquake:** Sudden shaking of Earth's surface due to movement of tectonic plates or volcanic activity

Causes of Earthquakes

1. **Tectonic Movement** → Plates collide, separate, or slide → Most common
2. **Volcanic Eruption** → Magma movement triggers tremors
3. **Human Activities** → Mining, reservoirs, nuclear tests

Focus & Epicenter

- **Focus / Hypocenter** → Point inside Earth where earthquake originates
- **Epicenter** → Point on surface directly above focus → Maximum damage

Seismic Waves

1. **Primary Waves (P-waves)** → Fastest, compressional → Travels through solids & liquids
2. **Secondary Waves (S-waves)** → Slower, shear → Travels only through solids
3. **Surface Waves** → Cause maximum damage → Love & Rayleigh waves

Measuring Earthquakes

- **Richter Scale** → Magnitude
- **Mercalli Scale** → Intensity & effects

Earthquake-prone Zones in India

- **Zone V (Most severe)** → Himalayas (Jammu & Kashmir, Himachal, NE states)
- **Zone IV** → North India & North-East plains
- **Zone III & II** → Peninsular India

3. Important SSC Points – Volcanoes & Earthquakes

- **Volcano** → Barren Island (Active), Narcondam (Dormant)
- **Cause** → Tectonic movement, hotspots
- **Earthquake** → Sudden shaking → Focus & Epicenter
- **Seismic waves** → P, S, Surface
- **Measurement** → Richter (Magnitude), Mercalli (Intensity)
- **Earthquake zones** → Himalayas (Zone V), Peninsular India (Zone II–III)