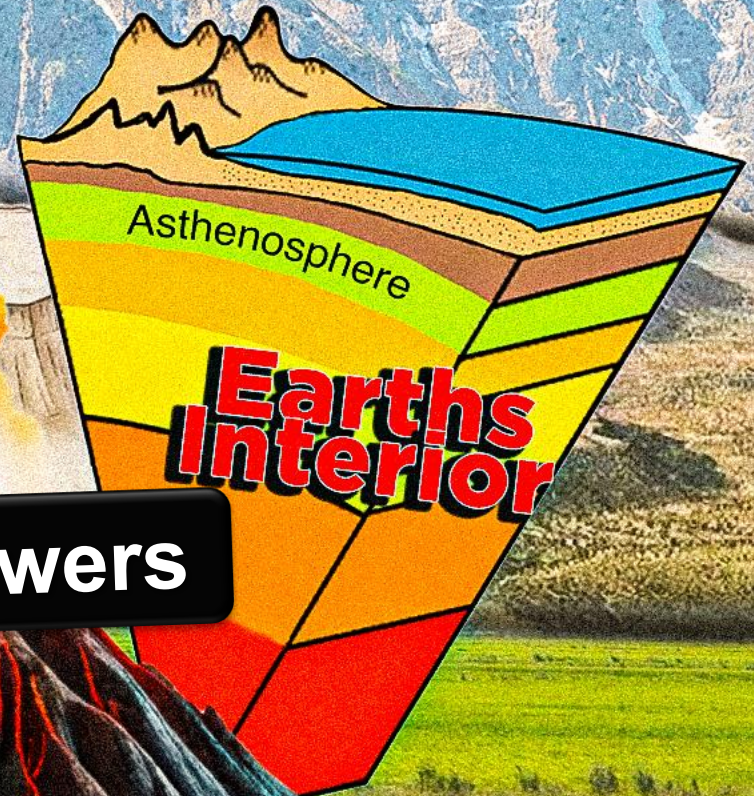


CBSE

9th Class - Geography - Chapter 2

Shaping of Earth Surface

NEW SYLLABUS



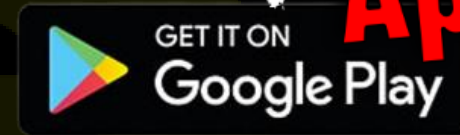
Complete Questions & Answers

In these Notes.....

- ✓ Textbook Exercise (Complete)
- ✓ Practice MCQs (more than 50)
- ✓ Short Answers
- ✓ Long Answers
- ✓ Practice Questions



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History



Geography



Civics



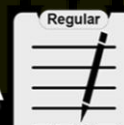
Economy



Mapping



Notes



TEST

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Q1. What are the sources of energy that are required to cause movements associated with the internal forces of the Earth?

- ✓ The internal forces of the Earth (endogenic forces and plate movements) are mainly powered by the heat inside the Earth, which comes from radioactivity by elements such as uranium, thorium and potassium within the crust and mantle.
- ✓ This internal heat sources drive convection currents in the mantle (due to heat differences), which in turn cause movements of tectonic plates and other internal forces like folding, faulting, earthquakes and volcanic activity.

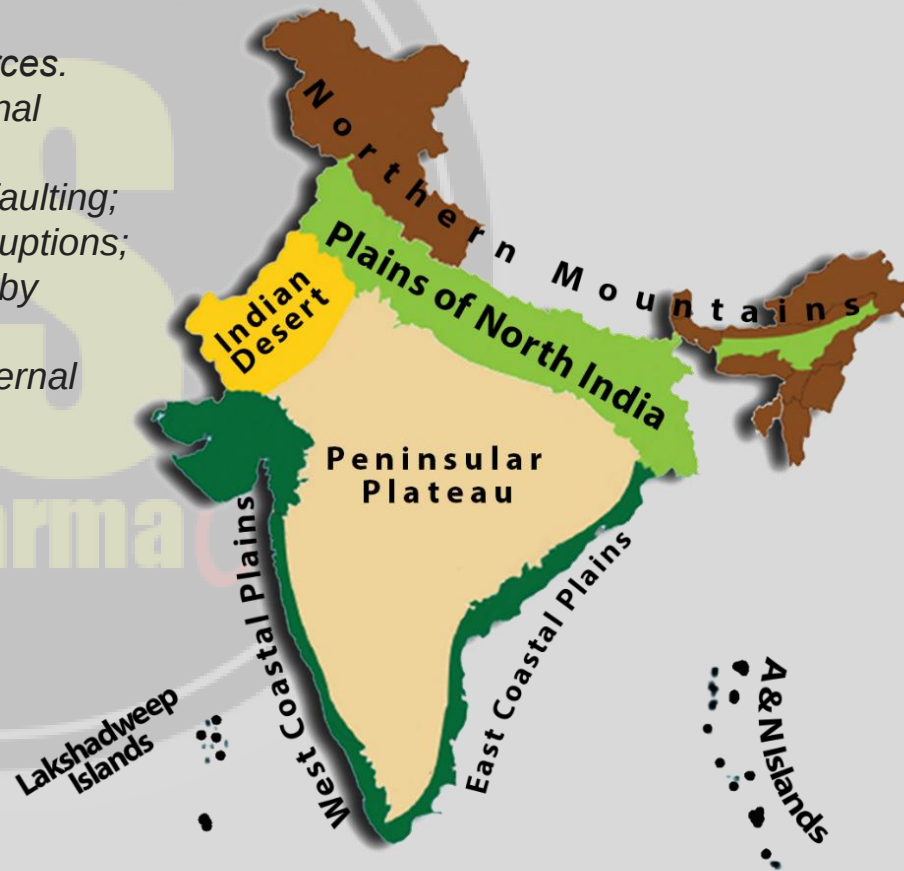
Q2. Relate various physiographic divisions you have studied in the earlier grades with various endogenic forces responsible for their origin.

“Various physiographic divisions are the result of different endogenic forces.

- ✓ Young fold mountains like the Himalayas are formed by compressional forces and folding at convergent plate margins;
- ✓ block mountains and rift valleys originate from tensional forces and faulting;
- ✓ plateaus may form by broad crustal uplift or by extensive volcanic eruptions;
- ✓ volcanic cones and island chains (Andaman & Nicobar) are created by volcanism along plate boundaries.

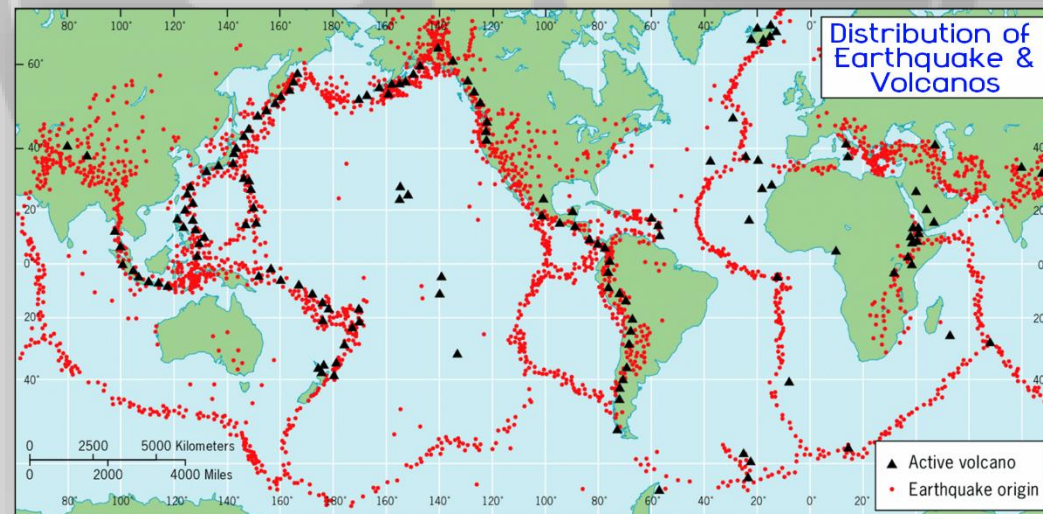
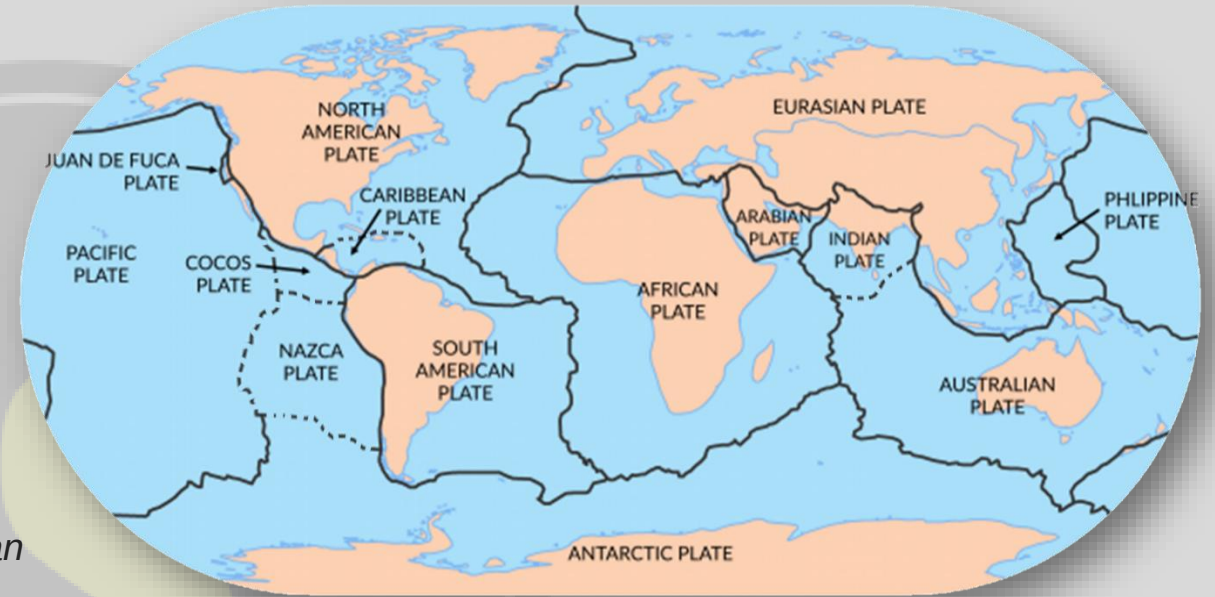
Thus, each major landform type can be related to a particular kind of internal (endogenic) movement inside the Earth.”

On other hand, Great North Indian Plains, Coastal plains & Thar Desert are formed due to erosional & depositional works of various agents of gradation such as Running water, Winds, Glacier, Coastal waves & underground water.



Q3. Why and where do earthquakes occur frequently? Is it possible to predict earthquakes?

- Earthquakes happen when rocks along plate boundaries are subjected to enormous forces due to plate movements and eventually slip suddenly, releasing stored energy as Earthquake (seismic waves). This sudden release causes the ground to shake. Most of this force build-up is a consequence of plate tectonics.
- Earthquakes occur worldwide but are heavily concentrated in narrow belts that coincide with plate boundaries such as convergent, divergent and transform margin. (for example, the Pacific “Ring of Fire,” the Himalayan belt, and the San Andreas Fault zone).
- At present no reliable method to precisely predict earthquakes in terms of exact date, time, location and magnitude, but scientists can estimate the likelihood of earthquakes on the basis of forecasting based on data and hazard assessment.



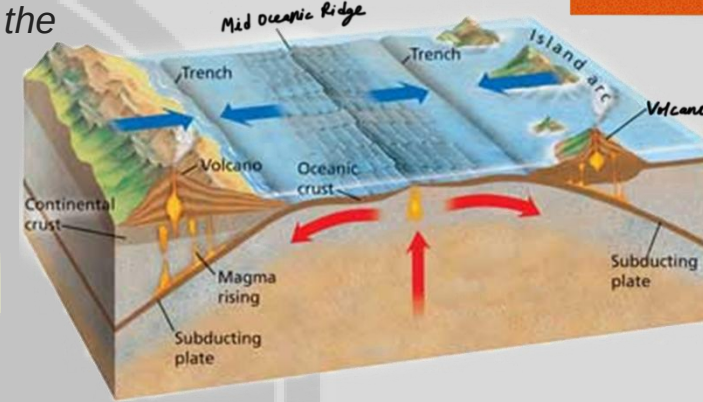
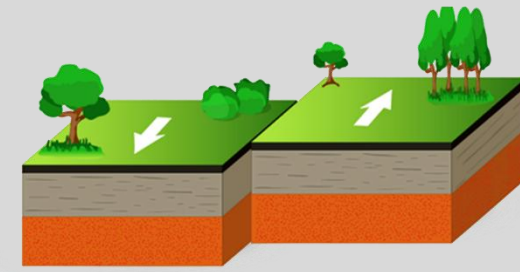
Q4. "Plate movements are responsible for the distribution of earthquakes and volcanoes." Explain.

"Earthquakes and volcanoes are mainly found along plate margins because tectonic plates are constantly moving.

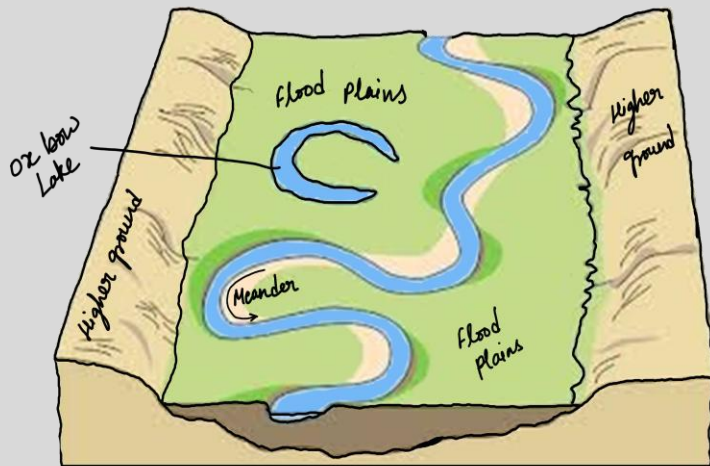
At convergent, divergent and transform boundaries, the plates collide, pull apart or slide past each other, building up stress in rocks and allowing magma to rise.

When rocks break suddenly along faults, earthquakes occur; when magma reaches the surface, volcanoes form.

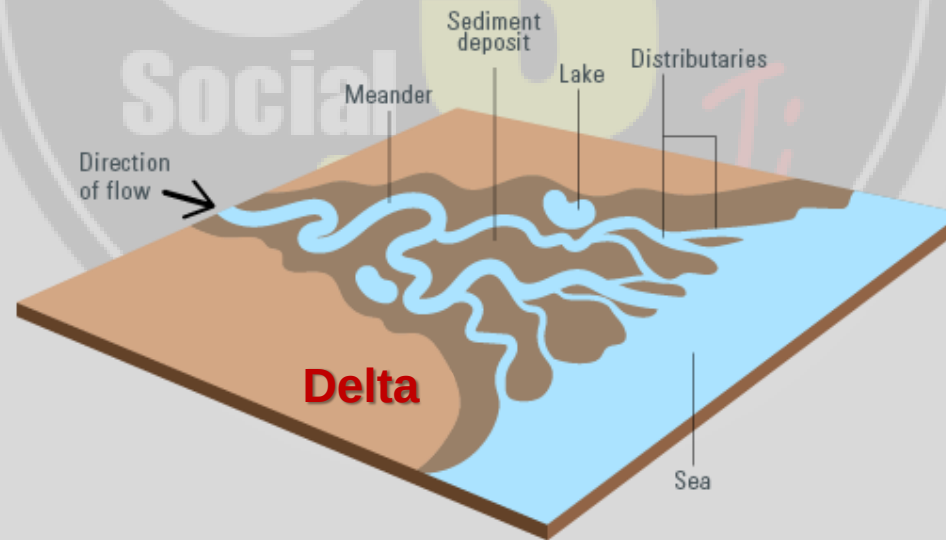
Thus, the movement and interaction of plates control where most earthquakes and volcanoes are found on Earth."



Q5. Draw and label a diagram of a meander and a delta.



Meandering



Q6. How are deforestation and erosion associated with each other? Explain.

- ✓ Deforestation and erosion are closely linked because removing forest cover makes the soil loose, exposed and much easier for water and wind to carry away.
- ✓ Tree roots bind soil particles together, giving the slope or surface mechanical strength and helping it resist being washed or blown away.
- ✓ When trees are cut, the protective canopy and litter are removed, and roots die; the soil is left bare and unanchored, so raindrops hit it directly and easily detach soil particles.
- ✓ Over time, this causes gully erosion, loss of soil depth and infertility of soil (Land Degradation).
Hence deforestation directly leads to faster and more severe soil erosion.”

Q7. Develop a plan to protect the land in your local area from erosion.

A good plan should combine community awareness with proper land-use practices that fit your local terrain. Here is a clear, student-friendly plan you can also adapt into a project answer.

- ✓ Protect bare soil with vegetation: Grow grass and shrubs on exposed slopes, open plots, and sides of roads so that roots hold the soil and reduce rain impact.
- ✓ On sloping fields or open lands, use **contour bunding and contour planting** so that bunds and furrows, slow down water and allowing it to soak in.
- ✓ Where slopes are steeper, build **small terraces or steps** and plant grass strips on them to break the speed of flowing water.
- ✓ Promote **strip cropping and crop rotation** so that soil is never left completely bare and its structure remains good.
- ✓ Where small channels or gullies have already formed, build **simple check dams** using stones, bricks or sandbags across the flow path to slow down water and trap silt.
- ✓ Plant **shelterbelts / windbreaks**—rows of trees or shrubs—along the edges of fields, playgrounds and open grounds to reduce wind speed near the ground.
- ✓ Conduct **awareness activities** in schools and neighborhoods (posters, rallies, tree-planting drives) explaining how cutting trees or overusing land increases erosion, floods and dust.

All these measures together will reduce the speed of water and wind, keep the soil bound, and conserve our land.”

Q8. Which disasters do you think you might experience in your region? Discuss a mitigation plan in your classroom.

Case based question, draw insights from Q10 & Q13, Also refer video lecture.

Q9. Prepare a model of landforms created by underground water.

Underground water, especially in areas of limestone or soluble rocks, creates unique landforms called Karst topography through chemical weathering and erosion.

Common landforms of underground water include:

Caves (hollow spaces formed as acidic water dissolves rock),

Stalactites (icicle-shaped formations hanging from the ceiling of caves),

Stalagmites (formations rising from the floor of caves),

Sinkholes or dolines (depressions formed when the ground collapses into an underground cavity), and

Underground rivers (which flow through cave systems).

These landforms are important for humans because caves and underground rivers provide sources of fresh water, tourism opportunities, and, in some cases, cultural, or religious significance.



Q10. What precautionary measures will you take if you are staying in an earthquake-prone region?

- ✓ Get your house checked for earthquake-resistant construction and follow safe building codes wherever possible.
- ✓ Secure heavy furniture and appliances (almirahs, bookshelves, TVs, geysers, refrigerators) to walls so they do not topple.
- ✓ Keep heavy and breakable items (glassware, showpieces) on lower shelves, not on top.
- ✓ Do not keep flower pots or heavy objects on parapets or high ledges.
- ✓ Learn how to switch off electricity, gas and main water supply; teach all family members.
- ✓ Prepare an emergency kit with water, dry food, torch, batteries, first-aid box, essential medicines, important documents and some cash.
- ✓ Decide a family meeting point and an emergency contact person (even a relative in another city) in case you get separated.
- ✓ Identify safe spots in each room: under a strong table/desk or next to an inside wall away from windows.
- ✓ Participate in or conduct simple “mock drills” at home or school.

Q11. Prepare a map showing landform-associated disasters that happened in the current calendar year.

For Map See last page of these Notes.

Q12. Create a poster showing landforms considered to be sacred or important in your region, and add the folk stories associated with them.

Sacred landforms include rivers, mountains, hills, forests and confluences that people treat as living holy spaces rather than just “natural features”.



Q13. Document a case of a disaster that hit your region in the past, highlighting its effects on various human activities.

Type of disaster: Flash floods and landslides caused by cloudburst and very heavy rainfall.

Region: Mountainous areas of Uttarkashi and Chamoli districts, Uttarakhand.

Time: In August 2025.

Short description: In August 2025, a series of cloudbursts and extremely heavy rain in Uttarkashi and Chamoli districts of Uttarakhand triggered flash floods and landslides. Mountain streams like the Kheerganga and other tributaries suddenly swelled, sending mud, rocks and water into big villages such as Dharali and nearby settlements. Many houses, shops and roads were damaged, and several people were killed or went missing.”

Effects on different human activities: Flash floods and landslides destroyed or buried houses, killing some residents and leaving many missing. Families were forced to leave their homes, taking shelter in school buildings, temples or government relief camps. Electricity, drinking water and mobile networks were disrupted for days, affecting basic communication and safety.

Effect on transport and communication: Landslides blocked national highways and mountain roads & key routes, cutting off villages. Bridges were washed away or damaged, making it impossible for buses and trucks to move; tourists and pilgrims were stranded at hill stations. This delayed rescue operations and the supply of relief material like food, medicines and fuel.

Effect on agriculture and rural livelihoods: Terraced fields were eroded or washed away by the force of water, damaging crops. Livestock (goats and cows) were killed or injured. Many families lost their homes, shops, orchards or fields, increasing poverty and forcing migration.

Effect on environment and infrastructure: Critical infrastructure such as small hydropower plants, roads, and water supply lines suffered damage, requiring costly repairs. Rivers carried large quantities of debris—boulders, logs, and mud—which changed river channels in some places and damaged hydropower projects, bridges and pipelines.

Effect on governance and disaster management: The government had to organize large rescue and relief operations, and the disaster showed the need for better early-warning systems, strict building rules and careful planning in the fragile Himalayan region.

This recent disaster shows how fragile the Himalayan environment is and how natural disasters can affect health, travel, economy and governance at the same time.

Use same answer structure to document any disaster in your region.

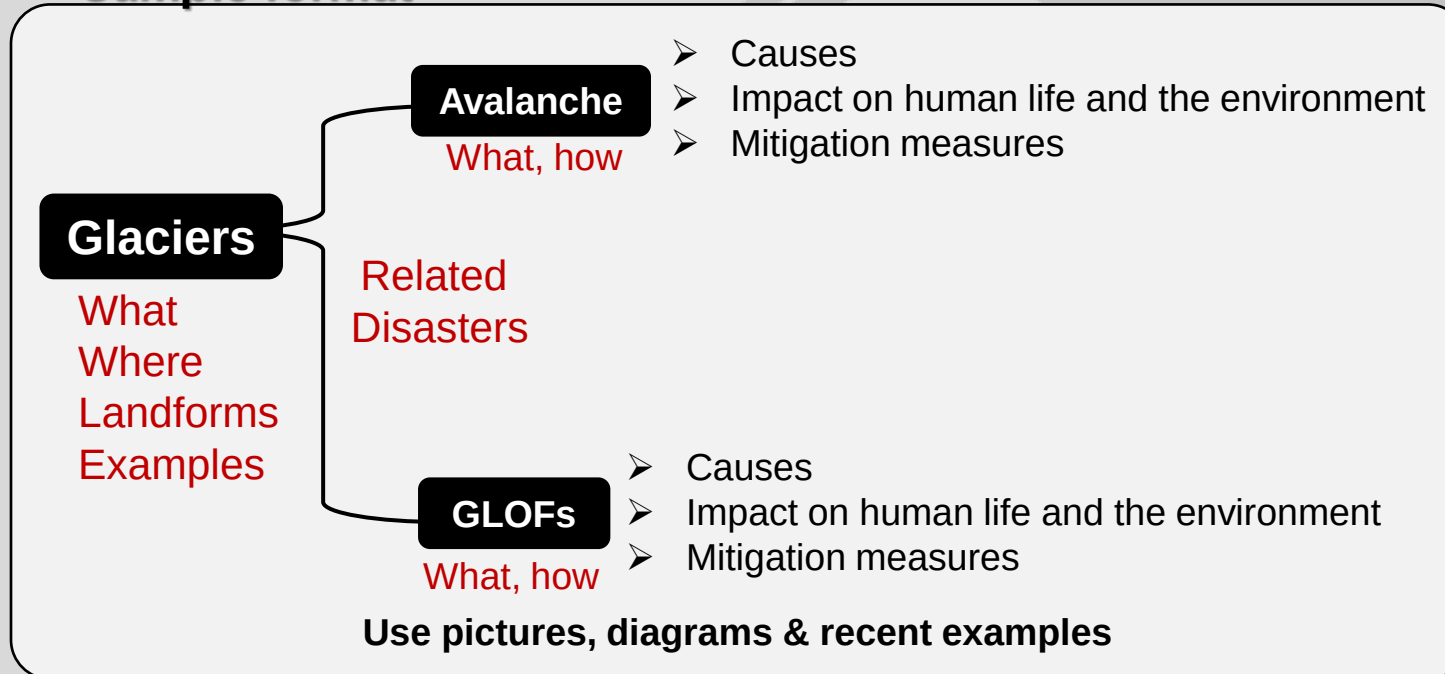
Q14. Translate the given poster on landslide into your native language and display it in your home.

Self work & activity based question

Q15. Divide the class into three groups. Each group will work on one project (water, wind, and glacier). The project should highlight the causes, impact on human life and the environment, and mitigation measures.

Project & activity based question.

Sample format



Q. The solid outermost layer of the Earth is called

- A. core
- B. mantle
- C. CRUST**
- D. asthenosphere

Q. Which statement best describes plate tectonics?

- A. Plates are fixed and never move
- B. Plates float on the inner core
- C. PLATES FLOAT AND MOVE ON THE MANTLE**
- D. Plates are only found under oceans

Q. The inner core of the Earth is mainly composed of

- A. rock and sand
- B. nickel and iron
- C. NICKEL AND IRON**
- D. water and gases

The large, rigid pieces of the Earth's lithosphere are called

- A. blocks
- B. TECTONIC PLATES**
- C. ridges
- D. shelves

Q. Which process is responsible for the breakdown of rocks in situ (in their own place)?

- A. erosion
- B. transportation
- C. WEATHERING**
- D. deposition

Q. When two plates move away from each other, they form a:

- A. convergent boundary
- B. DIVERGENT BOUNDARY**
- C. transform fault
- D. subduction zone

Q. Which of the following is an erosional feature of a river?

- A. delta
- B. flood plain
- C. WATERFALL**
- D. beach

Q. Weathering caused by temperature changes is called

- A. chemical weathering
- B. biological weathering
- C. PHYSICAL WEATHERING**
- D. marine weathering

Q. When rocks are dissolved by water containing acids, it is:

- A. physical weathering
- B. CHEMICAL WEATHERING**
- C. biological weathering
- D. wind erosion

Q. Which statement best explains why tectonic plates move on Earth's surface?

- A. **They are pushed by convection currents in the semi-molten mantle.**
- B. They are pulled by gravity acting only on continental landmasses.
- C. They float on a rigid, solid mantle that never changes.
- D. They are driven by winds blowing across the oceans and continents.

Q. When two plates move towards each other, the boundary is called:

- A. divergent boundary
- B. transform boundary
- C. **CONVERGENT BOUNDARY**
- D. passive boundary

Q. A V-shaped valley with a steep gradient is most likely formed by which agent of gradation?

- A. Wind blowing across desert surfaces.
- B. A glacier moving slowly down a mountain.
- C. **A river cutting downwards into the landscape.**
- D. Sea waves continuously crashing against a cliff.

Q. At a convergent plate boundary where an oceanic plate meets a continental plate, which landform is most likely to develop?

- A. A flat, featureless plain with no major elevation changes.
- B. mid-ocean ridge in the middle of the ocean.
- C. wide rift valley splitting the continent in two.
- D. **deep ocean trench and a chain of volcanic mountains.**

Q. Which process best describes erosion rather than weathering?

- A. Acidic rainwater reacting with limestone and dissolving parts of it.
- B. **Loose soil and rock fragments being carried away by a fast-flowing river.**
- C. A granite rock slowly breaking into smaller pieces due to repeated heating and cooling.
- D. Water freezing in cracks and widening them over time.

Q. At the mouth of a river, a triangular-shaped deposit is called a:

- A. valley
- B. **DELTA**
- C. dune
- D. plateau

Q. What is the main difference between the continental crust and oceanic crust?

- A. Both continental and oceanic crust have the same thickness and composition everywhere.
- B. **Continental crust is thicker and lighter , while oceanic crust is thinner and heavy .**
- C. Continental crust is thinner and made mostly of basalt, while oceanic crust is thicker and granitic.
- D. Oceanic crust is made entirely of molten magma, while continental crust is completely solid.



Q, Which of the following best describes the structure of Earth's interior from the surface to the center?

- A. Crust, outer core, mantle, inner core.
- B. Crust, mantle, outer core, inner core.**
- C. Mantle, crust, inner core, outer core.
- D. Inner core, outer core, mantle, crust.

Q. Which landform is mainly created by coastal erosion through the action of waves?

- A. A sea arch formed in a rocky headland.**
- B. A cirque carved high in a glaciated mountain.
- C. A crescent-shaped sand dune in a desert.
- D. An oxbow lake in a river valley.

Q. Which situation is most likely to lead to the formation of a fold mountain range?

- A. A river meanders across a floodplain, depositing fine sediments.
- B. An oceanic plate moves away from another oceanic plate, creating new crust.
- C. Two continental plates collide and compress, bending the crust upwards.**
- D. Wind deposits sand in layers, forming sand dunes in a desert.

Q. The Himalayas were formed due to

- A. divergent plate movement
- B. transform plate movement
- C. CONVERGENT PLATE MOVEMENT**
- D. volcanic eruption alone

Q. Which statement best describes the role of glaciers as agents of gradation?

- A. Glaciers only deposit sediments and never erode rock.
- B. Glaciers are stationary ice masses that do not move or change landscapes.
- C. Glaciers erode rock by plucking and abrasion and also deposit material as moraines.**
- D. Glaciers act only like rivers, forming V-shaped valleys.

Q. An ox-bow lake is formed from

- A. glacial erosion
- B. wind deposition
- C. CUT-OFF MEANDER OF A RIVER**
- D. volcanic activity

Q. The process by which weathered material is carried away is called

- A. weathering
- B. deposition
- C. EROSION**
- D. upliftment

Q. When a river enters a plain, it may develop a curve called a:

- A. canyon
- B. MEANDER**
- C. dune
- D. spit

Q. The movement of plates is driven mainly by

- A. ocean currents
- B. CONVECTION CURRENTS IN THE MANTLE**
- C. blowing wind
- D. rotation of the Moon

Q. Glaciers are found mainly in:

- A. deserts
- B. plains
- C. HIGH MOUNTAIN REGIONS AND POLAR AREAS**
- D. coastal areas

Q. A deep, steep-sided valley formed by a glacier is called a

- A. delta
- B. U-SHAPED VALLEY**
- C. V-shaped valley
- D. dune

Q. Moraines are

- A. sand dunes formed by wind
- B. ACCUMULATION OF GLACIAL DEBRIS**
- C. deposits of river silt
- D. wave-cut platforms

Q. Wind is a major agent of erosion in

- A. polar regions
- B. ARID AND SEMI-ARID REGIONS**
- C. tropical rainforests
- D. river valleys only

Q. The steep rock face along the coastline formed by wave erosion is called a:

- A. dune
- B. delta
- C. SEA CLIFF**
- D. terrace

Q. Caverns and caves are formed by

- A. wind erosion
- B. glacial deposition
- C. DISSOLUTION BY UNDERGROUND WATER**
- D. sea waves

Q. Agents of gradation are mainly

- A. only rivers
- B. only glaciers
- C. RIVERS, GLACIERS, WIND, WAVES, AND UNDERGROUND WATER**
- D. only waves

Q. Which of the following is a depositional feature of a glacier?

- A. cirque
- B. MORaine**
- C. U-shaped valley
- D. horn

Q. Which landform is typically created by wind deposition in deserts?

- A. delta
- B. DUNE**
- C. cave
- D. cliff

Q. Which type of force builds up the Earth's relief by uplift and mountain building?

- A. exogenic forces
- B. erosional forces
- C. ENDOGENIC FORCES**
- D. atmospheric forces

Q. Crescent-shaped sand dunes formed by wind are called

- A. moraines
- B. BARCHANS**
- C. deltas
- D. spits

Q. Sea waves are powerful agents of

- A. weathering only
- B. COASTAL EROSION AND DEPOSITION**
- C. glacial erosion
- D. underground weathering

Q. A bowl-shaped hollow at the head of a glacier is called

- A. dune
- B. CIRQUE**
- C. delta
- D. trench

Q. Depositional feature formed by waves parallel to the coast is called :

- A. dune
- B. BEACH**
- C. delta
- D. cirque

Q. Underground water mainly creates landforms in regions with

- A. basalt rocks
- B. LIMESTONE ROCKS**
- C. granite rocks
- D. sandstone only

Q. A cone-shaped deposit of minerals formed on the floor of a cave is called a

- A. stalactite
- B. STALAGMITE**
- C. moraine
- D. dune

Q. Icicle-like deposits hanging from the roof of a limestone cave are

- A. stalagmites
- B. STALACTITES**
- C. moraines
- D. deltas

Q. The process which makes the Earth's surface more even by erosion and deposition is called

- A. upliftment
- B. GRADATION**
- C. folding
- D. faulting

Q. The lithosphere consists of

- A. crust and core
- B. mantle and core
- C. CRUST AND UPPERMOST MANTLE**
- D. whole Earth

Q. The semi-molten layer on which plates float is called

- A. crust
- B. ASTHENOSPHERE**
- C. inner core
- D. outer crust

Q. Landslides are most common in

- A. flat plains
- B. deserts
- C. STEEP MOUNTAINOUS AND HILLY AREAS**
- D. mid-ocean ridges

Q. New crust is formed mainly at

- A. convergent boundaries
- B. DIVERGENT BOUNDARIES (MID-OCEAN RIDGES)**
- C. transform boundaries
- D. subduction zones

Q. The Ring of Fire is associated with

- A. deserts and dunes
- B. polar glaciers
- C. EARTHQUAKES AND VOLCANOES AROUND THE PACIFIC OCEAN**
- D. grasslands

Q. Volcanic activity is most closely related to

- A. deserts
- B. PLATE BOUNDARIES**
- C. plains
- D. tropical forests

Q. Exogenic forces mainly

- A. uplift land from inside
- B. create new crust
- C. WEAR DOWN LAND SURFACES THROUGH WEATHERING AND EROSION**
- D. move tectonic plates

Q. Rocks broken by plant roots or burrowing animals undergo

- A. physical weathering only
- B. chemical weathering only
- C. BIOLOGICAL WEATHERING**
- D. no weathering

Q. Erosion differs from weathering because erosion

- A. breaks rocks in place
- B. TRANSPORTS WEATHERED MATERIAL**
- C. forms new rocks
- D. happens only in deserts

Q. When rivers, winds, or glaciers drop the material they were carrying, the process is called

- A. weathering
- B. erosion
- C. DEPOSITION**
- D. upliftment

Q. The flat fertile land on either side of a river in its lower course is called

- A. delta
- B. FLOOD PLAIN**
- C. dune field
- D. moraine

Q. An area of limestone with features like caves, sinkholes, and disappearing streams is called

- A. desert
- B. KARST TOPOGRAPHY**
- C. delta plain
- D. flood plain

Q. Which combination best describes conditions leading to avalanches?

- A. gentle slopes, thick forests
- B. STEEP SLOPES, HEAVY SNOWFALL, AND SUDDEN DISTURBANCE**
- C. flat plains, low rainfall
- D. deserts, strong winds

Q. Which of the following is NOT a major cause of landslides?

- A. heavy rainfall
- B. earthquakes
- C. DEEP SEA FISHING**
- D. deforestation

Q. Avalanches occur primarily in

- A. deserts
- B. coastal regions
- C. SNOW-COVERED MOUNTAIN SLOPES**
- D. river deltas

Q. A GLOF (Glacial Lake Outburst Flood) occurs when

- A. sea waves erode cliffs
- B. dunes shift in deserts
- C. A GLACIAL LAKE DAM MADE OF ICE OR MORaine SUDDENLY BURSTS**
- D. underground rivers dry up

Q. Which group correctly lists four landform-related disasters highlighted in the chapter?

- A. hurricanes, tsunamis, droughts, tornadoes
- B. LANDSLIDES, AVALANCHES, GLOFS AND DUST STORMS**
- C. cyclones, floods, heat waves, blizzards
- D. forest fires, oil spills, epidemics, famines

Q. Earthquakes are most closely associated with

- A. deserts
- B. PLATE BOUNDARIES**
- C. coastal plains
- D. sand dunes

Q. Which factor can trigger a GLOF?

- A. gentle breeze
- B. RISING TEMPERATURES, HEAVY RAINFALL OR EARTHQUAKES**
- C. light snowfall
- D. slow river flow

Q. Dust storms are most common in

- A. dense forests
- B. high mountains
- C. DESERT AND SEMI-ARID REGIONS**
- D. coastal wetlands

Q. Avalanches are most similar to landslides, except that they involve

- A. rock and soil
- B. SNOW AND ICE**
- C. sea water
- D. underground water



Q. Human activities that increase the risk of dust storms include

- A. terrace farming on hills
- B. DEFORESTATION, OVERGRAZING AND POOR FARMING PRACTICES**
- C. reforestation
- D. building check dams

Q. Dust storms are linked to which landform condition?

- A. thick vegetation cover
- B. BARE, DRY SOIL AND LOOSE SAND ON PLAINS AND DESERTS**
- C. permanent snow cover
- D. rocky cliffs only

Q. Which of the following is a common impact of landslides?

- A. formation of deltas
- B. BLOCKING ROADS, DESTROYING HOUSES AND DAMAGING INFRASTRUCTURE**
- C. increasing soil fertility immediately
- D. creating sand dunes

Q. GLOFs can be especially dangerous because

- A. they happen slowly over years
- B. THEY CAUSE SUDDEN, HIGH-ENERGY FLASH FLOODS DOWNSTREAM**
- C. they never reach villages
- D. they occur only in uninhabited regions

Q. Which disaster is directly connected to unstable mountain slopes and heavy rainfall?

- A. dust storms
- B. LANDSLIDES**
- C. sea storms
- D. drought

Q: Define plate tectonics. How is it related to the formation of major landforms like mountains and ocean basins?

- ✓ *Plate tectonics is the theory that the Earth's lithosphere is broken into large and small plates that float and move over the semi-molten asthenosphere (part of mantle). Major cause of this moving plates is push from rising convective currents in semi-molten mantle.*
- ✓ *The convergent, divergent and transform movement of these plates create major landforms such as fold mountains (at convergent boundaries) and mid-ocean ridges and ocean basins (at divergent boundaries).*
- ✓ *This theory also helps explain major phenomena like earthquakes and volcanos & their distribution on earth's surface.*

Q: Distinguish between the crust, mantle and core of the Earth on the basis of composition and state of matter.

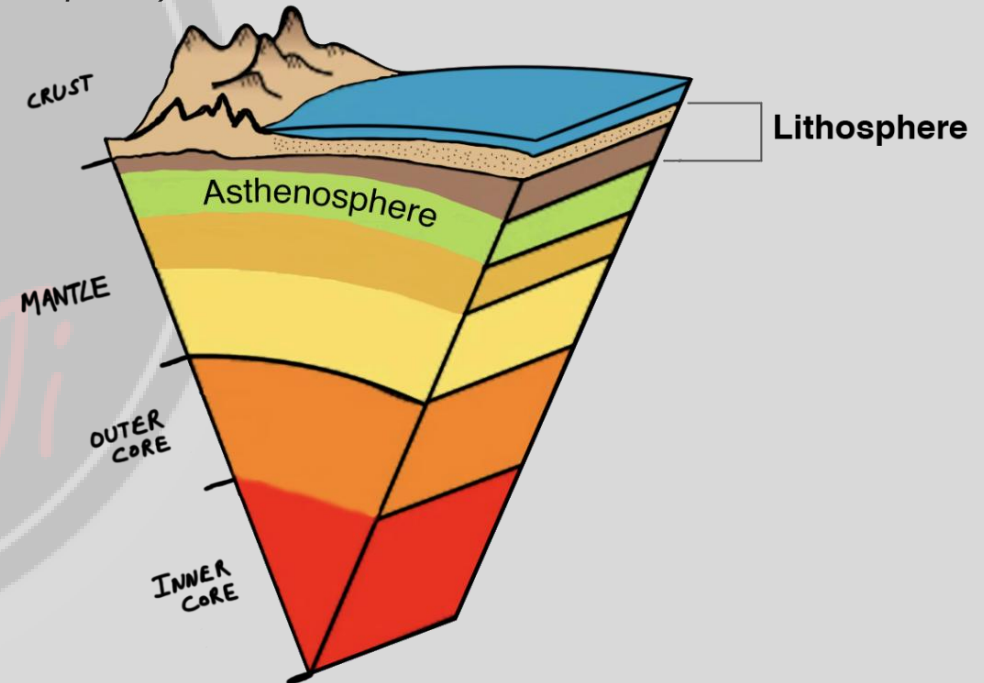
- ✓ *Crust: Thinnest, solid outer layer made mainly of silicate rocks (continental and oceanic crust).*
- ✓ *Mantle: Thick layer beneath the crust, mostly solid but plastic in the upper part (asthenosphere), composed of silicate minerals rich in iron and magnesium.*
- ✓ *Core: Innermost layer, rich in nickel and iron; outer core is liquid, inner core is solid.*

Q: What is the lithosphere? Why is it described as being broken into plates?

The lithosphere is the rigid outer layer of the Earth consisting of the crust and uppermost mantle. It is described as being broken into plates because it is divided into several large and small tectonic plates that move slowly over the softer asthenosphere beneath.

Q: Explain the difference between endogenic and exogenic forces with one example each.

Endogenic forces originate within the Earth and build up the Earth's crust, for example, earthquakes, volcanic eruptions and mountain-building movements. Exogenic forces operate at or near the Earth's surface and wear down relief, for example, weathering, erosion and deposition by rivers or wind.



Q: Differentiate between the continental crust and the oceanic crust.

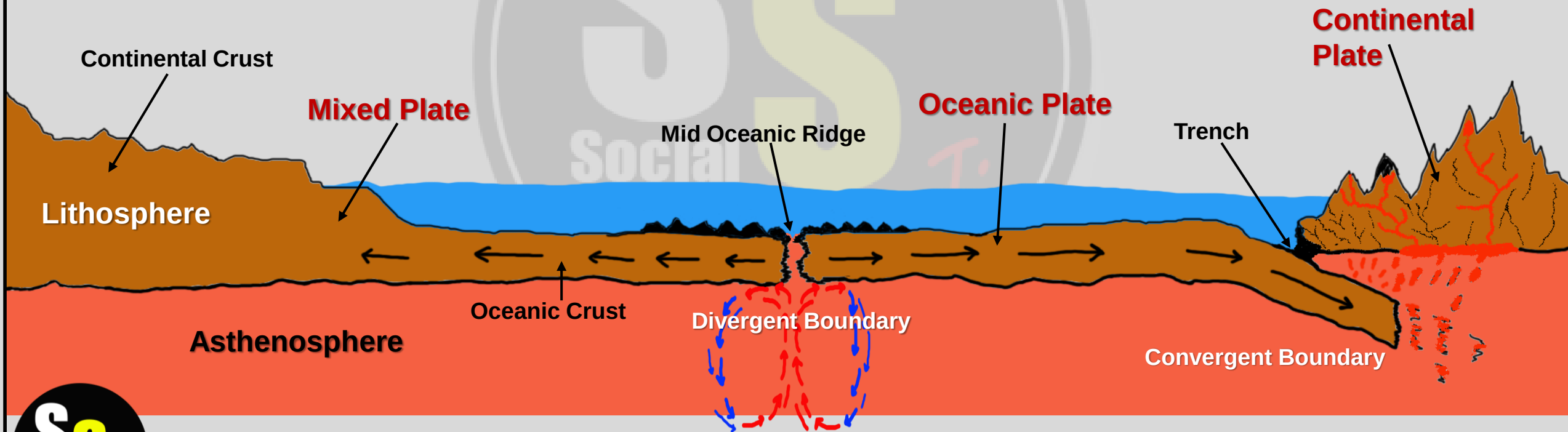
- ✓ Continental crust is thicker (about 35 km on average), less dense and composed largely of granitic rocks.
- ✓ Oceanic crust is thinner (about 5–10 km), more dense and mainly basaltic in composition.

Q: Name the three main types of plate boundaries and briefly describe each.

- ✓ Divergent boundary: Plates move apart, and new crust is formed (e.g., mid-ocean ridges).
- ✓ Convergent boundary: Plates move towards each other, leading to subduction or mountain building.
- ✓ Transform boundary: Plates slide past each other horizontally, often causing earthquakes.

Q: How do mid-ocean ridges form?

Mid-ocean ridges form at divergent plate boundaries where two oceanic plates move apart, magma rises from the mantle to fill the gap, cools, and solidifies to create new oceanic crust.



Q. Difference between Weathering & Erosion

Weathering	Erosion
<i>Breakdown of Rocks and minerals through atmospheric conditions.</i>	<i>Transportation of weathered rocks and soil by wind, water, ice & gravity.</i>
<i>In-situ process, No largescale movement involved</i>	<i>Ex-situ process, Largescale movement involved</i>
<i>Types: Physical, Chemical & Biological weathering</i>	<i>Agents: Water Erosion, Wind Erosion, Ice Erosion</i>
<i>It takes very long time</i>	<i>It is comparatively faster</i>
<i>Weathering contributes to the formation of soil and sediment.</i>	<i>Erosion gives rise to landforms such as valleys, canyons, and beaches.</i>

Q. Difference between Crust, Lithosphere & Asthenosphere.

Crust: Upper most solid part of earth's surface. Thickness varies from 30–40 km under continents to 5–7 km under the ocean.

Lithosphere: The rigid outer layer of the Earth that includes the crust and upper mantle.

Asthenosphere: A hot, mobile uppermost part of mantle layer (up to 200Km) made partially of molten rock.

Q: Name any two agents of gradation and explain how they work to level the Earth's surface.

- ✓ Rivers and wind are two agents of gradation. Rivers erode highlands, transport the material and deposit it in lowlands, forming plains and deltas, thus reducing differences in height.
- ✓ Wind erodes loose material from exposed surfaces and deposits it elsewhere, gradually smoothing and leveling desert landscapes.

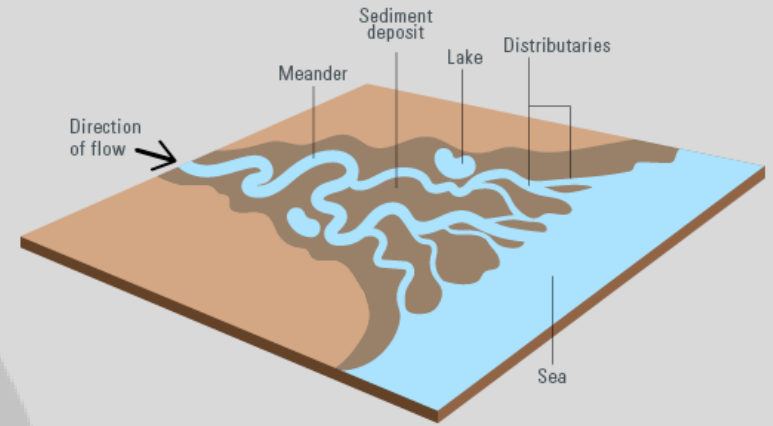
Q: How does a river in its upper course shape the land? Mention any two landforms formed in this stage.

- ✓ In its upper course, a river has a steep gradient and strong flow, causing vertical erosion.
- ✓ It cuts deep into the bed, forming landforms such as V-shaped valleys, gorges and waterfalls.



Q: What is a delta? Under what conditions is a river more likely to form a delta at its mouth?

- ✓ A delta is a triangular or fan-shaped deposit of sediments at the mouth of a river where it enters a sea or lake.
- ✓ Deltas form where the river carries large amounts of silt, the sea is shallow and calm, and tides or currents are weak so that deposited material is not washed away.



Q: Explain how glaciers erode the land and name two landforms produced by glacial erosion.

- ✓ Glaciers erode land mainly lifting and pulling away rock fragments and scraping and grinding the valley floor and sides.
- ✓ Two landforms produced include U-shaped valleys and cirques (bowl-shaped hollows).

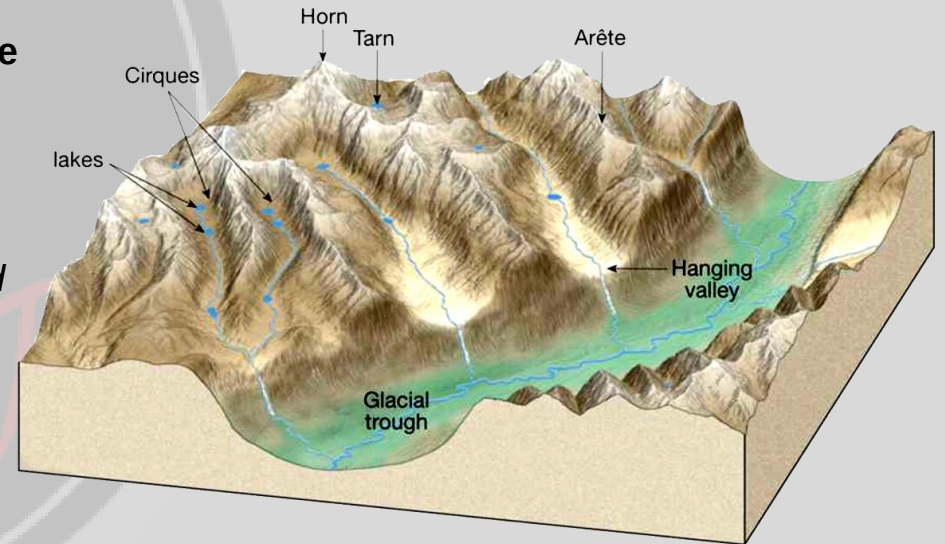
Q: Suggest any three measures that communities in hilly regions can take to reduce the impact of landslides and related disasters.

Three measures are:

- ✓ Avoiding construction and deforestation on very steep and unstable slopes.
- ✓ Building proper drainage systems to prevent water from saturating slopes.
- ✓ Planting deep-rooted trees and using engineering measures like retaining walls and terracing to stabilize slopes, along with early warning and evacuation plans.

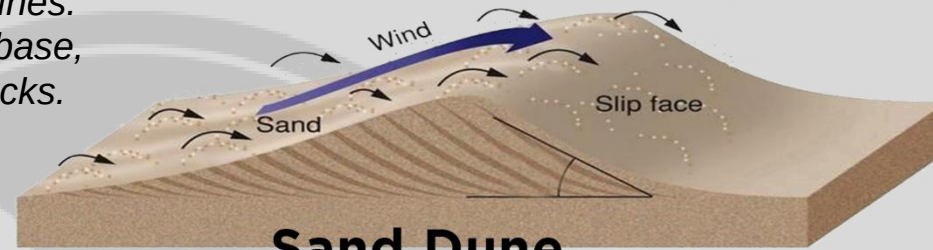
Q: What is the mantle? Mention one characteristic that affects plate movement.

The mantle is the layer between the crust and core, extending to about 2,900 km depth. Its upper part is partially molten and capable of slow flow (convection currents), which drives the movement of tectonic plates.



Q: How do wind actions in deserts lead to the formation of dunes and mushroom rocks?

- ✓ In deserts, wind erodes loose sand particles and transports them. When wind speed decreases, sand is deposited, forming dunes.
- ✓ Wind-blown sand also erodes rock surfaces more near the base, narrowing the lower part and creating mushroom-shaped rocks.



Sand Dune



Mushroom rock

Longitudinal dunes

Barchan dunes

Parabolic dunes

Star dunes

Q: what are dunes ? Briefly explain its types.

There are several types of dunes, including

barchan dunes (which are crescent-shaped and form in areas with limited sand and a single wind direction), **longitudinal dunes** (which are long ridges formed parallel to the prevailing wind), **star dunes** (which have multiple arms and form where winds come from different directions), and **parabolic dunes** (U-shaped dunes often stabilized by vegetation).

Q: What is karst topography? Name and describe any two landforms formed by underground water in limestone regions.

- ✓ Karst topography is a landscape formed in limestone regions due to the solution action of underground water.

Two landforms are:

- ✓ **Sinkholes (dolines):** Funnel-shaped depressions formed when the roof of an underground cavity collapses.
- ✓ **Stalactites and stalagmites:** Icicle-like deposits hanging from the roof (stalactites) and cone-shaped deposits rising from the floor (stalagmites) of caves formed by precipitation of dissolved minerals.



Q: Describe briefly how sea waves create coastal landforms like sea caves, arches and stacks.

Sea waves continuously attack weak points in coastal cliffs, enlarging cracks to form sea caves. When caves on opposite sides of a headland meet, they form a sea arch. When the roof of the arch collapses, an isolated vertical pillar of rock remains, called a stack.

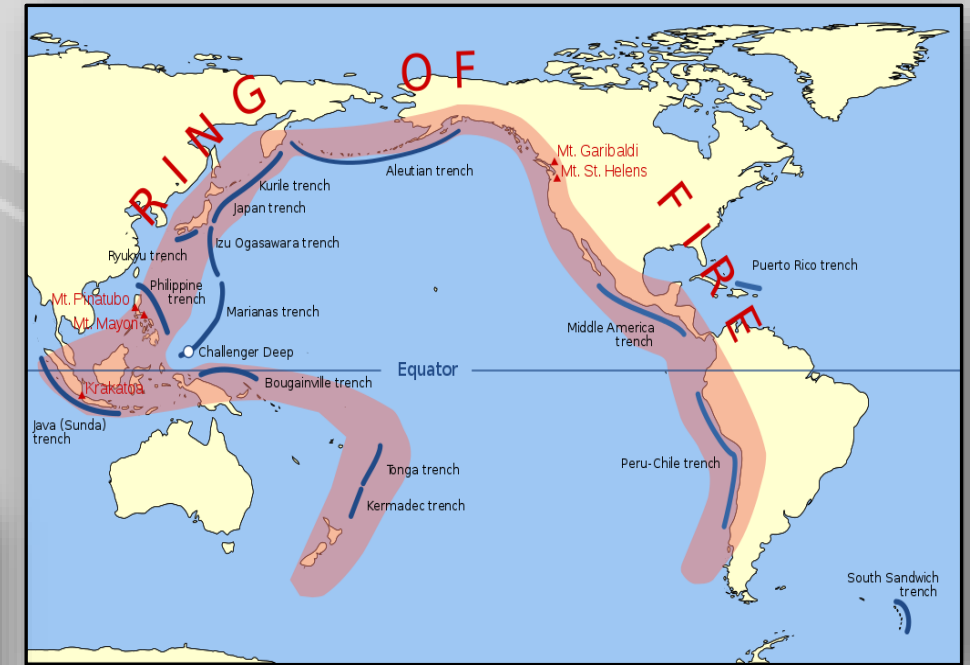
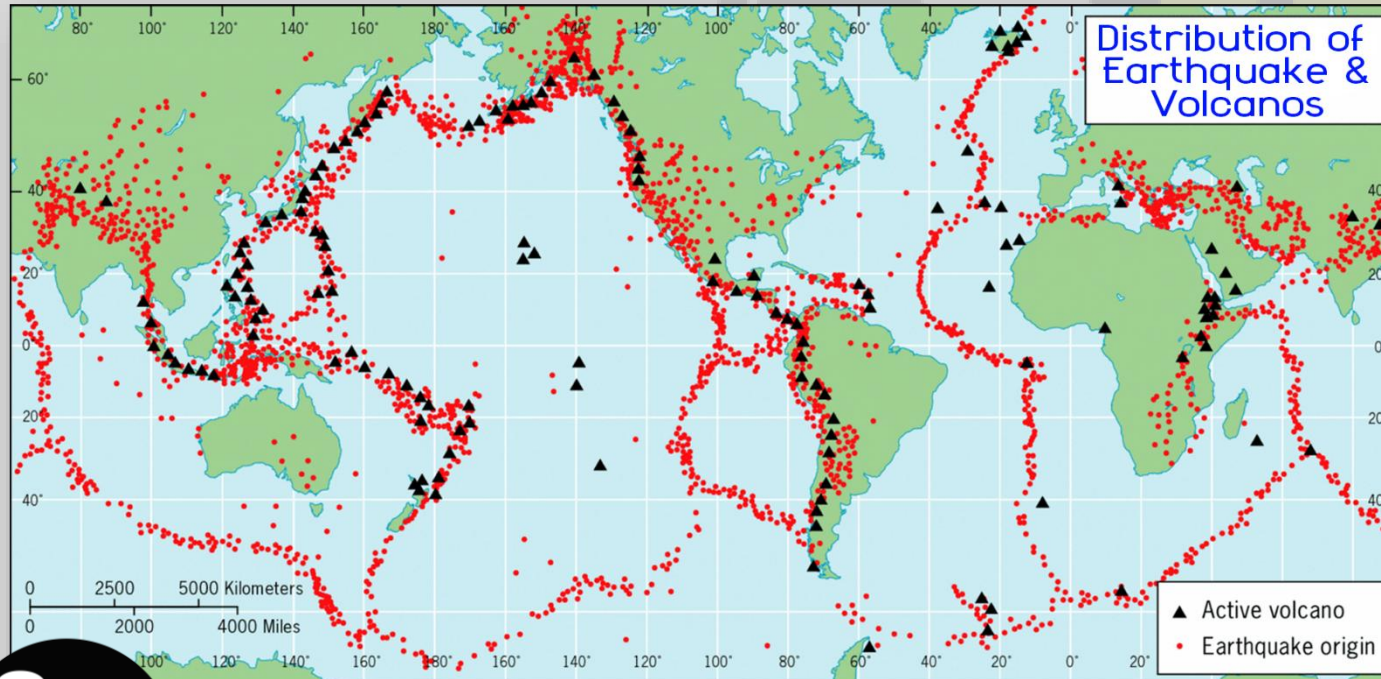


Q: What is meant by the term “Ring of Fire”? How is it linked to plate tectonics?

The Ring of Fire is a belt of frequent earthquakes and volcanoes around the edges of the Pacific Ocean. It is linked to subduction zones and complex plate interactions around the Pacific plate.

Q: How does the study of plate tectonics help us understand the distribution of earthquakes and volcanoes?

Most earthquakes and volcanoes occur along plate boundaries where plates interact. By mapping plate margins, we can see that earthquake and volcanic activity is concentrated in these zones, explaining their uneven global distribution.



Q: How can human activities increase the risk of disasters associated with landforms such as landslides and dust storms?

Give any two examples.

Human activities can destabilize landforms and make them more prone to disasters.

- ✓ *For example, cutting forests and slopes for roads and houses in mountains increases the risk of landslides,*
- ✓ *and overgrazing and improper cultivation in dry regions expose soil, increasing the risk of dust storms.*

Practice Questions

Q: What are dust storms? How are they related to desert or semi-arid landforms and human activities?

Q: Explain what is meant by a Glacial Lake Outburst Flood (GLOF). How is it linked to glacial landforms?

Q: What is an avalanche? Why are avalanches considered a serious hazard in high mountain areas?



Complete from Video Lectures or Class Lectures.

Use diagrams & Examples in answers (compulsory).



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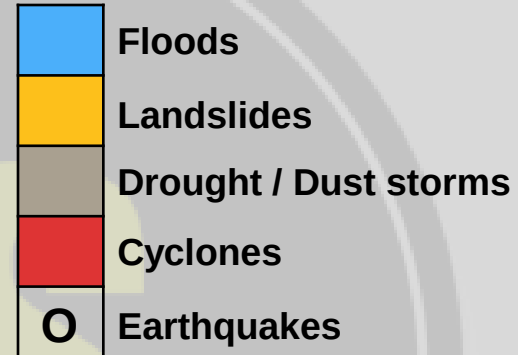
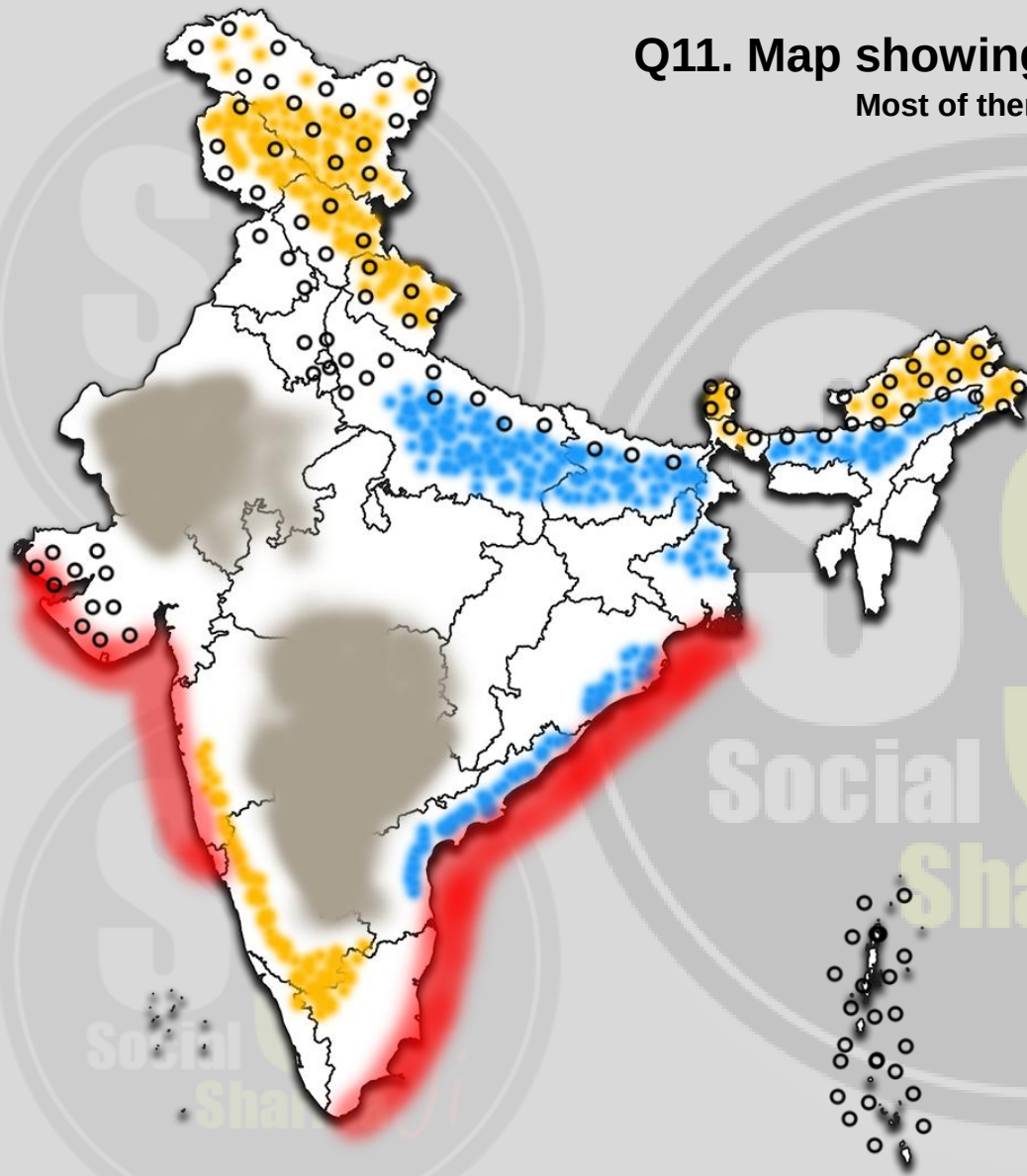


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Q11. Map showing disasters areas in India

Most of them are landform associated



Avalanche & GLOFs - Down stream settlements along Glaciers/Rivers/Lakes in high altitude & glacier regions of Sikkim, Uttarakhand, Jammu & Kashmir, Ladakh, Himachal Pradesh, Arunachal Pradesh.





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