Ans 1.) Yes , water is also found beneath the Earth's surface:

- To start with , we have **groundwater**, which is water found in aquifers.Groundwater can be found just below the Earth's surface or as deep as 30,000 ft.This is liquid water.
- Another interesting example is of **Lake Vostok** , which is a lake 500m below the sea level in Antartica.It is around 4000m under the surface of ice.It is a **subglacial** , **fresh water lake**.
- Two minerals , **Wadsleyite** and **ringwoodite** are known to contain water content in them.These are generally found in the **transition zone**, a region of Earth between the Upper Mantle and the Lower Mantle and is about 250-410 miles deep.Geophysicist, Steven Jacobson, found out that there is water inside the transition zone trapped in the minerals.This is not exactly liquid water.It is water that is trapped in the minerals.
- At the Mariana Trench , the Pacific plate plunges far beneath the nearby Philippine Sea plate through a process called subduction , and in the process carries vast quantities of **absorbed water** into the Upper Mantle.So we have water in the Upper Mantle too , about 60-100 miles deep.

Ans 2.) 3 activities which are altering the Earth are:

- **Emission of greenhouse gases due to Vehicles,Industries and Burning of Fossil Fuels** - With the growing human population , the amount of vehicles used and the number of industries have grown significantly.As a result a large amount of greenhouse gases are being released in the atmosphere.This has resulted in the melting of glaciers and depletion of Ozone layer.
- **Excessive and unbalanced Deforestation** - Unplanned and excessive deforestation has caused a lot of damage to the biosphere.Not only does it lead to global warming but it also results in habitat damage and biodiversity loss.
- **Polluting river bodies** - Every year , a large amount of waste is dumped into rivers and lakes , not to mention the oil spills that kill the wildlife and destroy the ecosystem of the river body.

Ans 3.) 3 slow processes are:

- **Erosion** - Carrying away of rock particles or soil by agents like water , wind , placiers etc.
- **Weathering** - Breaking of rocks through the actions of various elements of weather and climate
- **Formation of Mountains** - A slow process.Mountains are formed in many different ways some resulting from collisions between Earth's plates.

3 fast processes are:

- **Meteorite strike** - With the impact of a meteorite , large craters are formed within seconds
- **Earthquakes** - The sudden shaking of the Earth's surface because of release of a large amount of energy.
- **Volcanic Eruptions** - Although the process of building up of hot gases and lava can take several years , the eruption happens within seconds expelling large amounts of lava and ash in the atmosphere.Volcano eruptions can change even global temperatures , a process called volcanic winter.

Ans 4.)

- Yes , not every planet has a geodynamo system.Planets like Mars and Venus don't have an active geodynamo.There are various reasons as to why some planets have low or nearly zero magnetic field:

    - **Slow rotations** - Mercury has such a slow rotation that it ends up having a very weak magnetic field.Slow rotation does not set up the required dynamo effect.For quite a long time, this same reason was given to explain why Venus did not have a magnetic field.
    - **Absence of liquid inner core** - Another reason attributed to Mercury's weak magnetic field is that its core cooled and solidified more quickly than Earth's.The same reason goes for Mars.Magnetic fields are created when there is a dynamo system working inside the planet which requires convection of heat from the core to the mantle and convection cannot happen in solids.
    - **Absence of the plate tectonics mechanism** - The generation of a global magnetic field requires core convection, which in turn requires extraction of heat from the core into the overlying mantle.Venus lacks this plate tectonics mechanism , which is a hallmark of Earth.The rising and sinking of plates helps in the transfer of heat.Since this is absent in Venus ,heat cannot escape from the core fast enough to drive convection.

- If Earth did not have a magnetic field , it would have been quite different than what it is today:
    - **Excessive solar radiation** - Very high energy particles flow outward from the Sun at speeds of about 400km/s . If the magnetic field would not have been there , this harmful solar radiation would have killed many life forms of the Earth that we see today.
    - **Earth's Atmosphere would be destroyed** - The strong solar wind has the capacity to rip gasses out of the atmosphere.This is probably what happened to Mars.After losing its magnetic field , its atmosphere was lost.Low atmospheric pressure caused the water to be taken away by the solar wind too.Both , the atmosphere and water were lost.

- **Damage to technology** - Our satellites and electronic devices stand can get damaged due to the solar wind.This can create quite a havoc on our planet.This happened in the Geomagnetic Storm of 1989 , where an entire power grid of Quebec, Canada was knocked out.
- **Wavering compasses** - Probably the first thing we would notice, when the magnetic field gets switched off , is the unusual behavior of compasses.What used to be our sole sense of direction would not be reliable anymore.\
- **Cosmic ray radiation** - Apart from the solar radiation , earth's magnetic field also prevents the harmful cosmic rays from coming towards us.Without the magnetic field , worldwide health problems would become common killing a lot of life forms.