Date
21/08/2020

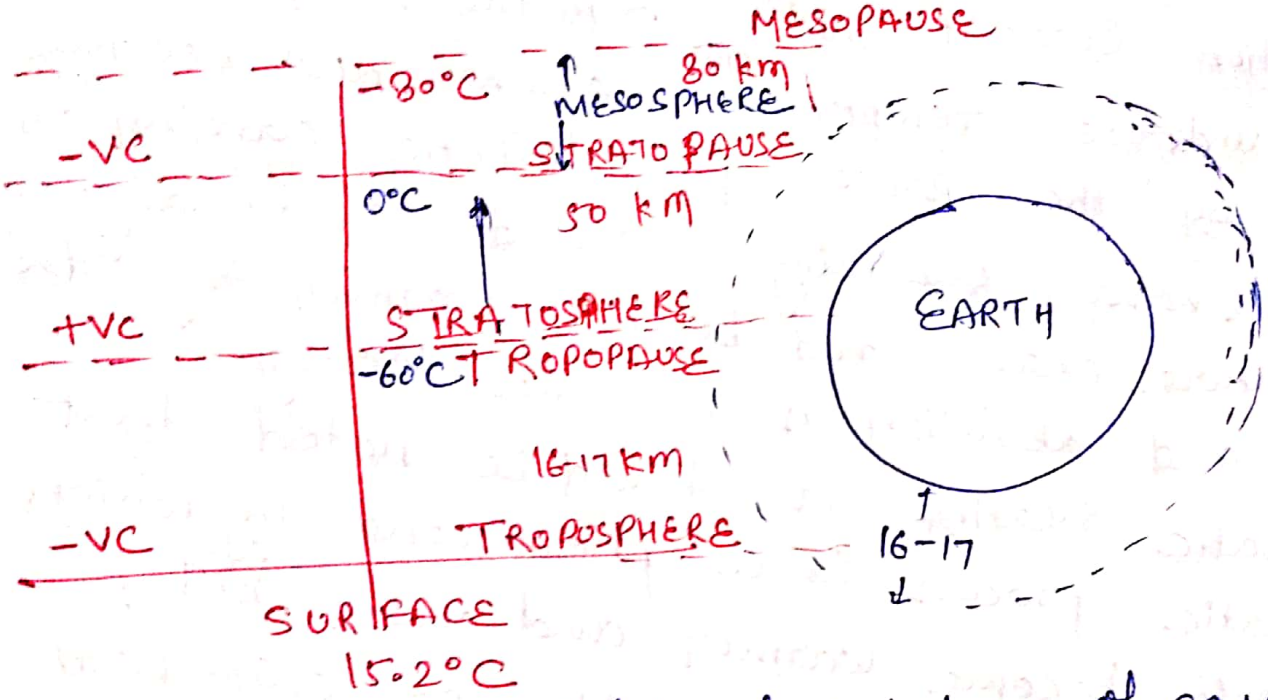
Topics - Pressure Belts and Atmospheric Circulation.

ADIABATIC COOLING & ADIABATIC HEATING

Convection currents rising from the surface of Earth undergoes temperature change and become Cooler by the process of adiabatic cooling on the other hand subsiding currents also undergoes temperature change and become warmer by the friction and abration in molecules through Adiabatic heating it should be noted that Adiabatic process is a phenomena by which Air parcle become warmer and cooler but; without absortion and radiation of unit heat. Similarly non-adiabatic process is a phenomena by which air-parcle undergoes a temp change by the absortion and radiation of energy. It means day warming and night cooling is a - non adiabatic phenomena.

CLIMATOLOGY

Atmosphere and Atmospheric Composition



Atmosphere is a mechanical mixture of gases not a chemical compound. This mixture contain two categories of gases that is constant and variable one suspended over the surface of earth by its gravitional attraction. Constant gases are those whose proportion or ratio does not changes with elevation and regions (Nitrogen, Oxygen and Argan). On the other hand variable gass are showing deviation in their proportionality with elevation and over different surfaces.

On the basis of mass, energy exchange mechanism between Earth and Atmosphere and within the layers of atmosphere, this mechanical mixture is categorised into several vertical concentric layers.

TROPOSPHERE

It is the lower most layer of atmosphere extended approximately up to 16-17 km over equator and 6-7 km over poles. Troposhere literlly means a zone of mixing or zone of turbulance. characterised by decrease in temperature with elevation under the influence of three possible atmospheric factors.

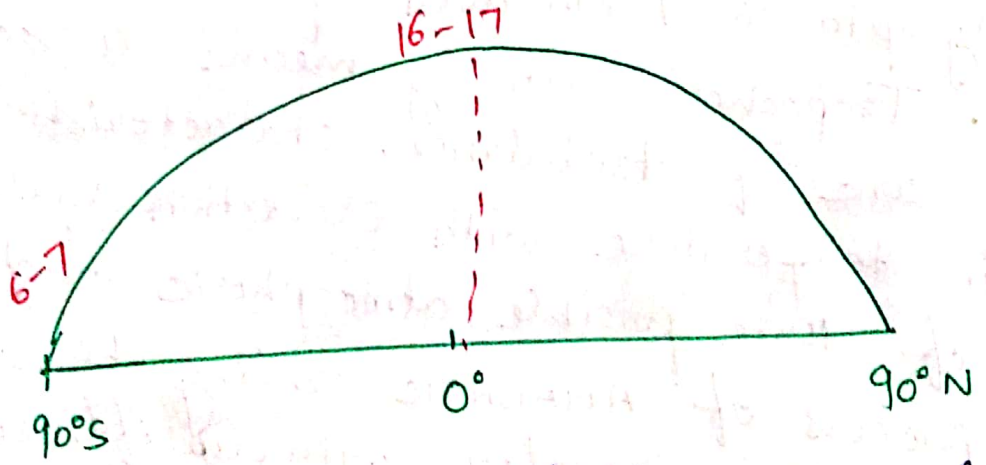
1⇒ The process of ADIABATIC cooling by which air parcles become cooler with upliftment

2⇒ Moving of air parcles away from the source of heat or the heat source.

3. Decrease in the net atmospheric pressure with elevation, as a result the air parcles of upper troposphere are less compresible to move in different direction.

(4)

Since troposphere is the lower most layer of atmosphere the exchange of mass and energy between earth and atmosphere would be maximum in the same layer of troposphere. Subsequently all prominent climatological phenomenas like Evaporation, condensation, cloud formation, precipitation atmospheric circulation, etc. takes place in the same layer of troposphere.



The average elevation of troposphere is maximum over equatorial latitudes, which decreases sequentially with ever increasing latitude it is because intence thermal condition pervail throughout the year over the equator to expand the reach of tropospheric molecules upto 16 km - 17 km at the same time the rate of rotation (linear velocity) is maximum over equator by which the expension of

troposphere could reach upto sixteen – 17 km height. on the other hand poles are featured by the presence of denser and stable air parcles and maximum impact of gravitational attraction.

STRATOSPHERE ⇒ It is extended upto 50 km of the surface and regarded as the intermediate layer of lower atmosphere. It is a well established notion that tropopause remain the segregating point between the zone of troposphere and stratosphere. This intermediate zone of stratosphere is further characterised by increased in temp with elevation under the influence of three possible atmospheric factors.

(i) Presence of a very active oxidising agent having a tendency to absorb heat in statitfied manner.

(ii) Absence of ADIABATIC COOLING

(iii) Prevelance of less denser gases molecules than troposphere. These less denser molecules able to absorb more unit heat by molecular contact and other factors.

MESOSPHERE

It extends from 50-80 km and regarded as the uppermost layer of lower Atmosphere. It is also featured by decrease in temp with elevation. Under the influence of three atmospheric factors.

1. The process of ADIABATIC COOLING
2. Less concentration of ozone
3. Absence of any green house gases.