

Topics - Tropical Cyclone

4. Air masses originating from subtropical high pressure belt and polar high pressure belt are converging over sub polar latitudes. The convergence of contrasting air masses develop a transitional zone between the two called as front.

Process of formation front designated as frontozonic. Along the boundary of front where the two contrasting air masses are converging, either warm air parcels ~~upwell~~ ^{upwell} from the zone of convergence or cold air parcels uplift them from the surface. In both the cases by the frequent upliftment and ~~upveiling~~ ^{welling} of warm air parcels, and intense low pressure condition also develop over the boundary of front. Subsequently approaching cold air masses also ~~upwell~~ ^{upwell} along the boundary of front in search of low pressure condition created by warm air parcels. By the regular upliftment and ~~upveiling~~ ^{upwelling} of both warm and cold air parcels from sub polar latitudes the net pressure applied by ~~or~~ ^{ex} prevailing air parcels

②

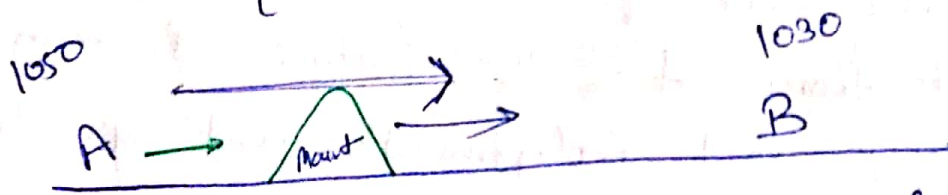
decreases drastically.

Polar High Pressure Belt

It is a thermally induced pressure belt prevailing over the surface of poles by the subsidence of cool and denser air parcels.

Atmospheric Circulation

$$\left\{ \text{friction force} \propto \frac{1}{\text{Potential Gradient force}} \right\}$$

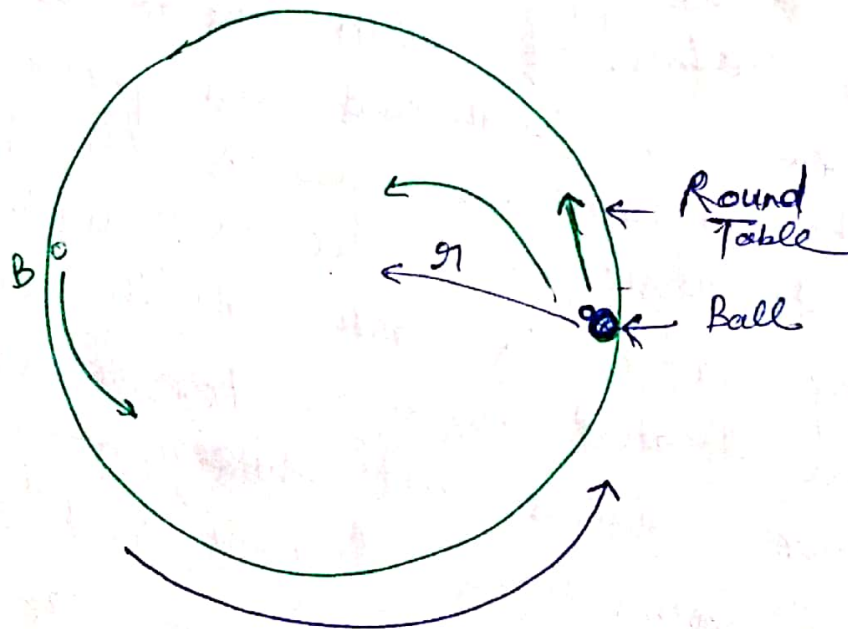


Circulation or wind motion prevailing over the surface of Earth get regulated by four different but sequential forces i.e; 1. The Pressure Gradient force, 2. friction force, 3. CORIOLIS force and 4. Centripetal Acceleration.

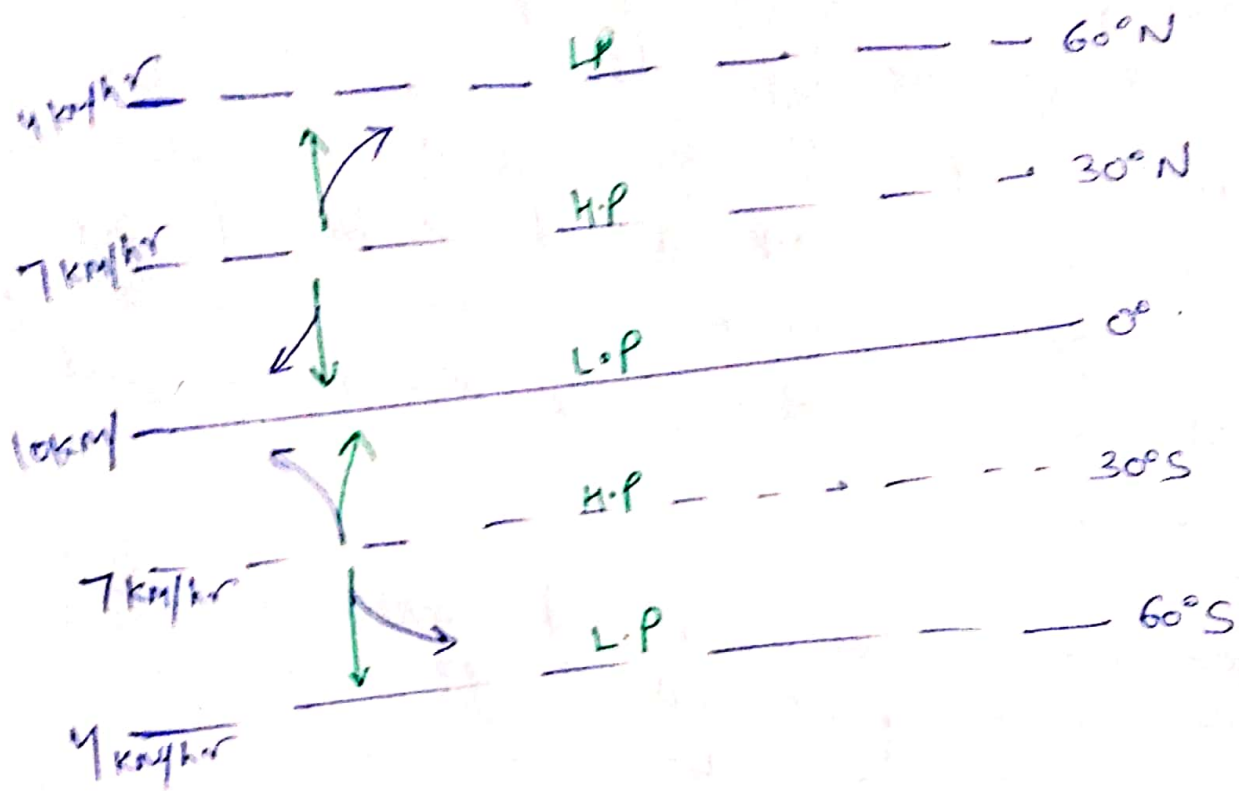
Pressure Gradient force is a regulatory phenomena which determine the velocity of moving air motion. It means high the pressure gradient more would be the velocity of winds.

It should be noted that under climatological^③ illustration, the consideration of pressure gradient force is being done by taking the reference of horizontal component of air motion. Vertical component of air motion get balanced by the law of gravity. at the same time density of atmosphere also reduces the velocity of wind motion.

friction force on the other hand reduces the wind velocity apart by several relief feature and abberation over the surface.



④



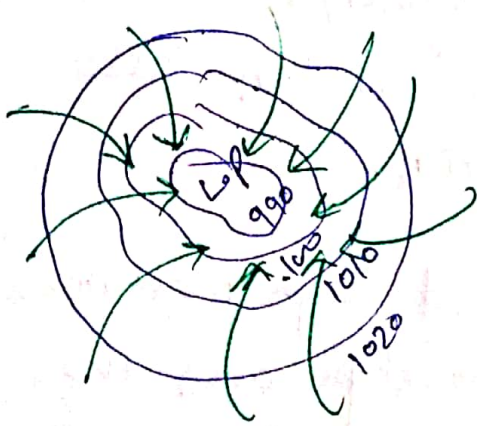
CORIOUS FORCE

CORIOUS is an apparent or virtual force acknowledge over the surface of earth due to the relative motion between earth and atmosphere and two zones of atmosphere. Since the linear velocity of earth and atmosphere decreases with ever decreasing radius of earth all the zones of atmosphere located near equator will rotate at higher rate towards east. Subsequently winds originating from higher latitude and approaching towards lower latitude always lag behind (towards west) on the other hands winds originating from lower and approaching towards higher latitude always move forward.

⑤

This resultant impact in the deviation of the moving object in a coordinated frame is regarded as CORIOLIS Impact.

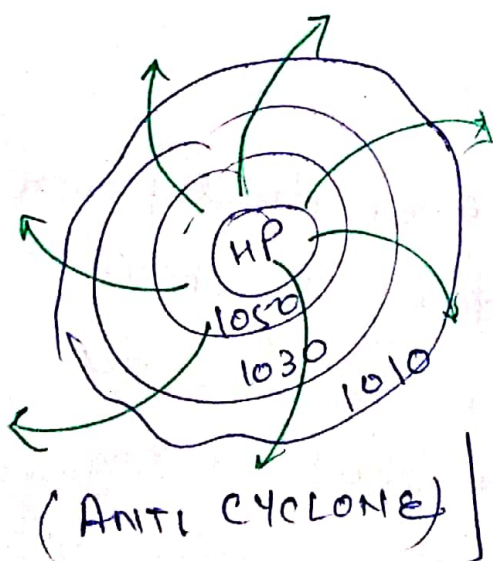
CORIOLIS force is a cross product of Angular velocity, velocity of wind in motion and latitudes it means with ever increasing latitudes the impact of CORIOLIS force also increases. It is because the velocity vector remain parallel to the axis of rotation near equator and becomes perpendicular over poles, subsequently the impact of CORIOLIS force is minimum over equator and maximum over poles.



If a centralised low pressure Area develop over the surface of earth surrounded by peripheral high pressure isobars then the winds, from the peripheral high pressure system start converging toward centralised low pressure Area these converging air parcels further comes under the

⑥ Influence of CORIOLIS force and deviate from there normal path. the resultant deviation around centralised low pressure area start a circulatory motion which appears to be anticlockwise in Northern and clockwise in southern hemisphere. It should be noted that the same circulatory converging wind motion or air motion get the designation of cyclones. 1

Wind motion acquiring circulatory moment around centralised low pressure also changes their direction rapidly change in direction also bring the change in the velocity of air motion to intensify centripetal acceleration in the system. It means increase in the velocity of air motion also increases the amount of deviation.



If centralised high pressure condition develop over the surface of Earth in a particular season, then winds start diverging from this centralised system to peripheri low pressure isobars.

Such diverging air parcel that rotates clockwise and anti clockwise in Northern and Southern

⑦
Hemisphere respectively are regarded as anti-cyclone. The Nomenclature of anticyclone is being used because of their propagation, mechanism and impact, which remains opposite to then that of cyclonic air motion.