

Q. Distinguish between thunderstorms and cyclones and their characteristics. 10 marks

The atmosphere is having good amount of energy in form of latent heat. When there is atmospheric instability and normal lapse rate is very high, phenomena in form of thunderstorm and tropical cyclone generates mainly between 5-degree North to 45-degree North latitude and 5-degree South to 45-degree South latitude.

[A diagram showing thunderstorm and its characteristics such as (CuNb) clouds with anvil shape and related expansion including thunder and lightning]

Thunderstorm are generated mainly over land during period of transition especially after equinox because of formation of low-pressure depression. The convective currents result in formation of Cumulo-Nimbus (CuNb) clouds. Over time the growth of CuNb cloud results into charged particles which is responsible for thundering and further expansion of this cloud.

Because of good amount of latent heat, moisture content, the same cloud provides torrential rainfall. Within hours more than 40-50 cm of rainfall gets recorded. Because of this phenomena sometimes Cloudbursts also take place. The recent floods of Assam, Uttarakhand, J&K and Amarnath are the result of thunderstorm.

On the other side tropical cyclone are mainly the sea or ocean related phenomena occurring at the time of transition from summer to winters. That is why maximum cyclones are forming in the month of August, September, October between 10-degree to 50-degree latitudes.

The conditions required for the formation of tropical cyclones are:

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1. Shallow and narrow water bodies. Only because of this the Bay of Bengal receive more tropical cyclones than Arabian Sea.

2. Minimum 27-degree Centigrade water temperature or high amount of latent heat.

3. High Coriolis force. Therefore, no formation of cyclones in equator region because of no Coriolis force present.

4. Upper atmospheric instability i.e., turbulence.

[A diagram of tropical cyclones showing its various characteristics]

Tropical cyclones die when they enter over land because of the cut-off of water vapor and evaporation. The wind speeds of tropical cyclones are very high because of extreme low pressure and their direction of movement is not fixed as they move under influence of easterlies and local winds.

Through the plantation of Mangroves and sheltering up of coasts, we can minimize the impact of tropical cyclones.