

Q) Briefly describe various segments of atmosphere. How these segments are maintaining the Earth Radiation Balance?

### Answer

The envelope of gases around the Earth is called it 'atmosphere'. Earth's atmosphere is divided into five basic layers, each with distinct characteristics -

#### Troposphere

This lower atmospheric layer starts from 8 Km and extends till 14 Km. Temperature here gradually decreases to  $-50^{\circ}\text{C}$ . Clouds are a distinct feature of this layer - Tropopause separates this layer from Stratosphere.

#### Stratosphere

The temperature in this layer gradually increases to  $50^{\circ}\text{C}$  due to presence of ozone layer. Height of this layer extends from 15 Km to 50 Km. Ozone is the layer that is implicated in maintaining Radiation Balance - Stratopause separates this layer from the next.

#### Mesosphere

This layer extends from 50 to 85 Km. It is the coldest layer where temperature reaches  $-100^{\circ}\text{C}$  - Meteors burn in this layer - Weather Balloons also are present here.

## Thermosphere

This layer extends from 85 Km to 500 Km. Temperature ranges between 250 to 1727°C. This is because of the presence of ions - Space shuttles and auroras exist here. This layer is also called 'upper atmosphere'.

## Erosphere

This is the layer beyond which unlimited space starts.

## Maintenance of Earth Radiation Balance

Earth's Radiation Balance depends on the amount of energy absorbed and reflected by the earth and its atmosphere.

- 1) Of the total sunlight that reaches the Earth's atmosphere, 6% is reflected back from atmosphere while 16% is absorbed by it.
- 2) 20% of Sun's radiation is reflected back by the clouds (troposphere) and 3% is absorbed by them.
- 3) 4% of the radiations are reflected back from the Earth surface and 51% are absorbed by land and ocean. This absorbed amount is eventually returned back via atmosphere and clouds back into the space.