Quick Revision Module

VVI for CAPF AC LDCE 2025 Geography

COMPOSITION OF THE ATMOSPHERE

Gases

Constituent Gas	Percentage Volume
Nitrogen	78.08
Oxygen	20.95
Argon	0.93
Carbon dioxide	0.036
Neon	0.002
Helium	0.0005
Krypton	0.001
Xenon	0.00009
Hydrogen	0.00005

Water Vapour

- Account for 4% of the air by volume : In Tropics.
- Less than 1% of the air: In deserts and Polar Regions.
- Decreases from the equator towards the poles.
- Absorbs heat and prevents extreme temperatures on earth.
- Moisture holding capacity is directly proportional to temperature.

Dust Particles

- Higher concentration of dust particles: In subtropical and temperate regions.
  Reason: Dry winds.
- Provide the nuclei to water vapour to form clouds.
- Blue colour of the sky: due to scattering by dust particles.
- Duration of twilight: Affected by the presence of these dust particles in air.

CHANGES IN ATMOSPHERE

AIR POLLUTION

- **Acid rain** - Result of increased pollutants in the atmosphere.
- Two gases are the main culprits: Sulphur dioxide (forms sulphuric acid) and Nitrogen oxides (forms nitric acid). Harmful for plants, fishes, forests, building etc.

GLOBAL WARMING

- **Major greenhouse gases :** Carbon dioxide, methane, nitrous oxide, water vapour and Ozone.
- **SF6:** Most potent greenhouse gas in existence. Widely used in circuit breakers, gas-insulated substations etc.

OZONE POLLUTION

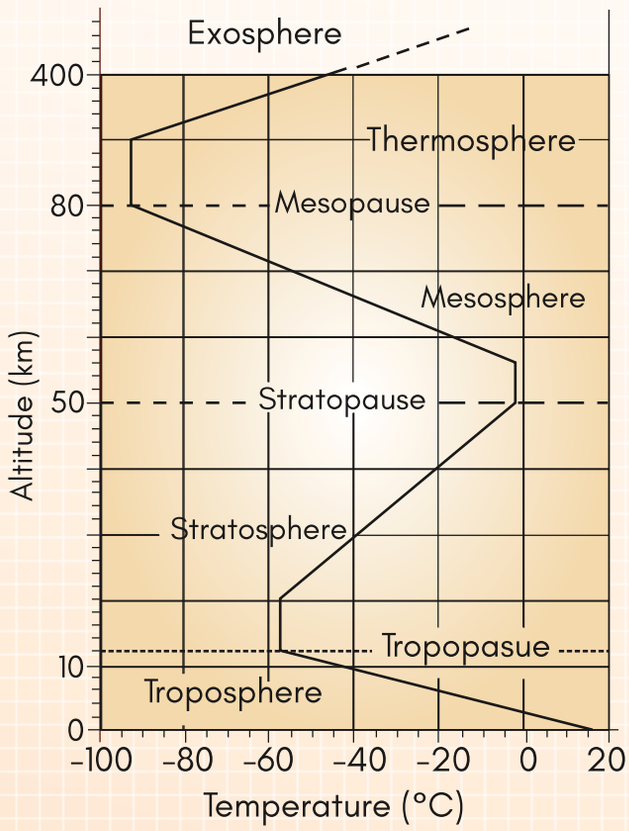
- **Ground-level ozone:** Sources
  a. Hydrocarbons,
  b. Small amounts of stratospheric ozone, occasionally migrate down to the earth's surface.
- **Tropospheric ozone: Formation:** By the interaction of sunlight (UV), hydrocarbons and nitrogen oxides.
- Damages vegetation; destroys nylon & rubber; injures living tissue, causes respiratory problems.

OZONE DEPLETION

- Caused due to release of chloro fluoro carbons (CFCs) .
- CFCs are widely used as cooling fluids in the refrigerating systems.
- **CFCs are transported to Antarctica region** by atmospheric wind systems. Here, it get trapped in the Antarctica cold air by polar vortex and deplete ozone layer.

STRUCTURE OF THE ATMOSPHERE

The atmosphere is divided into the five different layers depending upon the **temperature condition**. They are: troposphere, stratosphere, mesosphere, thermosphere and exosphere.



	Location & Height	Weather And Temperature Conditions	Significance
Troposphere	◆ Lowermost layer of the atmosphere. ◆ Average height is 13 km and extends to a height of 8 km near the poles and about 18 km at the equator.	◆ The temperature decreases at the rate of 1°C for every 165m of height. ◆ Lowest temperature found over the equator. ◆ All changes in climate and weather take place in this layer.	
Stratosphere	◆ Found above the tropopause and extends up to a height of 50 km. ◆ Having maximum concentration of ozone, called ozonosphere.	◆ Free of any clouds and weather changes. ◆ Temperature increases during summers and decreases during winters.	◆ Ideal place for flying of big planes.

Mesosphere	◆ Lies above the stratopause, and extends up to a height of 80 km from 50km.	◆ Temperature decreases with the increase in altitude. ◆ Coldest layer in the atmosphere.	
Thermosphere	◆ Located between 80 and 400 km above the mesopause. ◆ Contains electrically charged particles and also called ionosphere. ◆ Ionization occurs mainly as a result of ultra-violet, x-rays and gamma radiations. ◆ Divided into different layers, D-layer , E-layer, F1 & F2 layer and G-layer . D-layer & E-layer, exist only during day time and vanishes as soon as sun sets.	◆ Temperature increases rapidly with increase in height (upto 1500 deg C). ◆ Air is very thin.	◆ Radio waves from the earth are reflected back to the earth. ◆ Protects the earth from meteorites and remains of abandoned satellites.
Exosphere	◆ Uppermost layer of the atmosphere above the thermosphere. ◆ Lies beyond 400km to 1000s of kms where it merges with outer space.	◆ Temperature increases with height and may cross 5000 deg C. ◆ It is largely home to Helium and Hydrogen.	

STRATIFICATION OF ATMOSPHERE: ON THE BASIS OF CHEMICAL COMPOSITION

According to International Space Symposium 1962, atmosphere can be divided into two broad layers, namely **Homosphere** and **Heterosphere.**

	LAYERS	
PARAMETERS	**HOMOSPHERE**	**HETEROSPHERE**
Extension	Lower layer; extends up to 88km from the earth's surface.	Upper layer; extends beyond 88 km to more than 3500 km.
Proportions of the component gases	Uniform at different levels.	Non uniform in its composition.
Sub divisions	Troposphere, Stratosphere and Mesosphere.	Thermosphere.