

### Corrigendum/Explanation PTS 2026 Simulator Test 4

**There are no changes to the solutions/answers. Explanations have been provided for the students who have raised doubts.**

**Q.72)** There was doubt raised regarding Option IV of the question that they (aerosols) have a net warming effect on earth's atmosphere.

**Explanation) Statement IV is incorrect.**

If aerosol particles are not present in the atmosphere of earth, the Earth would be even warmer than it already is. Aerosol air pollution has made the planet with about 0.7° F (0.4 °C) cooler than it otherwise would be, according to the 2021 report by the Intergovernmental Panel on Climate Change (IPCC). Hence aerosol particles **have a net cooling (it was earlier written as a warming effect which was a mistake) effect on earth's atmosphere. The rest of the explanation part of the statement clearly indicates that the aerosols have a net cooling effect on earth's atmosphere.**

There is no change in the answer of the question.

#### **For Future Reference:**

**Q.72)** Consider the following statements regarding the aerosols in the atmosphere:

- I. They are completely anthropogenic and are not found naturally.
- II. They lead to the destruction of ozone in the stratosphere.
- III. They last in the atmosphere for a much shorter time period than carbon dioxide.
- IV. They have a net warming effect on earth's atmosphere.

Which of the above given statements are correct?

- a) I and II only
- b) II, III and IV only
- c) III and IV only
- d) II and III only

**Ans) d**

**Exp) Option d is the correct answer.**

Aerosols are small particles suspended in the atmosphere. They are often not or barely visible to the human eye, yet their impact on climate, weather, health, and ecology are significant.

**Statement 1 is incorrect:** Aerosols can be released in the atmosphere by both natural as well as the anthropogenic sources. Atmospheric aerosols consist of solid/aqueous particles suspended in the atmosphere and are typically of sizes in the range 0.001–10 μm. Aerosols are generated from a wide range of natural and anthropogenic sources Natural aerosols include sulfate aerosols that are

formed from emissions of sulfur dioxide from volcanic eruptions or from dimethyl sulfide emissions from phytoplankton in the ocean, sea salt particles emitted at the ocean surface, or mineral dust aerosol that is emitted by the effects of wind erosion on arid land. Anthropogenic aerosols, i.e., those that are generated from human activities, include sulfate, nitrate, black carbon, and organic carbon aerosols from fossil-fuel burning, deforestation fires, and burning of agricultural waste.

**Statement II is correct:** Aerosols also can act as sites for chemical reactions to take place. The most significant of these reactions are those that lead to the destruction of stratospheric ozone. During winter in the polar regions, aerosols grow to form polar stratospheric clouds. The large surface areas of these cloud particles provide sites for chemical reactions to take place. These reactions lead to the formation of large amounts of reactive chlorine and, ultimately, **to the destruction of ozone in the stratosphere.**

**Statement III is correct:** A **carbon dioxide** molecule has a **lifetime** of about **100 years** in the atmosphere, while an **aerosol particle** has an **average life expectancy** of only about **10 days**. Thus, this statement is **correct** as an **aerosol lasts a much shorter time** in the atmosphere than carbon dioxide. They are generally **classified as Short-Lived Climate Pollutants (SLCP)**.

**Statement IV is incorrect:** If aerosol particles are not present in the atmosphere of earth, the Earth would be even warmer than it already is. Aerosol air pollution has made the planet with about 0.7° F (0.4 °C) cooler than it otherwise would be, according to the 2021 report by the Intergovernmental Panel on Climate Change (IPCC). Hence aerosol particles have a net **cooling** effect on earth's atmosphere.

Source: <https://www.ncert.nic.in/ncerts/l/kech207.pdf>

<https://earth.gsfc.nasa.gov/climate/data/deep-blue/aerosols>

<https://earth.gsfc.nasa.gov/climate/data/deep-blue/aerosols#:~:text=Sea%20spray%2C%20mineral%20dust%2C%20smoke,from%20volcanoes%20or%20industrial%20emissions.>

<https://climate.nasa.gov/news/215/just-5-questions-aerosols/>

Subject:) Geography

Topic:) Atmosphere

Subtopic:)