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Q1

Consider the following statements : Statement-I : The atmosphere is heated more by incoming solar radiation than by terrestrial radiation. Statement-II : Carbon dioxide and other greenhouse gases in the atmosphere are good absorbers of long wave radiation. Which one of the following is correct in respect of the above statements ? (a) Both Statement-I and Statement-II are correct and Statement-II explains Statement-I (b) Both Statement-I and Statement-II are correct, but Statement-II does not explain Statement-I (c) Statement-I is correct, but Statement-II is incorrect (d) Statement-I is incorrect, but Statement-II is correct Official key: D.

UPSC Civil Services Prelims 2024 · General Studies · 2 marks · Geography

Physical, Indian and world geography - Prelims GS Paper I.

Explanation

(a)

Both correct and II explains I. The atmosphere is heated more by terrestrial long-wave radiation, not by incoming solar.

(b)

Both correct but II does not explain I. Statement-I is false.

(c)

I correct, II incorrect. I is the false limb; greenhouse gases do absorb long-wave.

(d) Official key

I incorrect, II correct. Earth heats the air; CO₂ and other GHGs absorb outgoing long-wave.

Summary

Official key is (d). Incoming solar radiation is mostly short-wave; the air is relatively transparent to it. The surface absorbs sunlight and radiates long-wave infrared, which greenhouse gases absorb - that is how the troposphere is heated. Statement-I reverses the mechanism. Statement-II is true and does not rescue I.

Related possible facts

These can be asked in a future Prelims paper.

Greenhouse effect

GHGs absorb terrestrial long-wave radiation and re-radiate, warming the lower atmosphere.

Albedo

Fraction of incoming solar radiation reflected by surface or clouds.

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