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Q29

Consider the following statements: I. Without the atmosphere, temperature would be well below freezing point everywhere on the Earth's surface. II. Heat absorbed and trapped by the atmosphere maintains our planet's average temperature. III. Atmosphere's gases, like carbon dioxide, are particularly good at absorbing and trapping radiation. Which of the statements given above are correct? (a) I and III only (b) I and II only (c) I, II and III (d) II and III only Official key: C.

UPSC Civil Services Prelims 2025 · General Studies · 2 marks · Geography
Physical, Indian and world geography - Prelims GS Paper I.

Explanation

(a)

I and III only. That drops the heat-trapping line, which is keyed.

(b)

I and II only. That drops the greenhouse-gas line.

(c) Official key

I, II and III. Without the atmosphere the surface would freeze; trapped heat sets the average temperature; CO₂ and similar gases absorb and trap radiation.

(d)

II and III only. That drops I.

Summary

- **Official Set A key is (c) all three. The atmosphere keeps Earth habitable:** without it the surface would be far colder (I); absorbed and trapped heat sets the planetary average (II); greenhouse gases such as CO₂ are good at absorbing and trapping long-wave radiation (III). All three are correct.

Related possible facts

These can be asked in a future Prelims paper.

Greenhouse effect

Long-wave absorption by H₂O, CO₂, CH₄, N₂O. Why III is true.

Earth's average temperature

About 15°C with atmosphere; far colder as a black body without GHGs. The physics behind II.

Moon / airless body

Huge day-night swing. Neighbour of Statement I's absolute.

Albedo

Ice and cloud reflect sunlight. A separate temperature control.

Runaway greenhouse

Venus. The extreme neighbour of III.

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