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Q62

**With reference to the Earth's atmosphere, which one of the following statements is correct? (a) The total amount of insolation received at the equator is roughly about 10 times of that received at the poles. (b) Infrared rays constitute roughly two-thirds of insolation. (c) Infrared waves are largely absorbed by water vapour that is concentrated in the lower atmosphere. (d) Infrared waves are a part of visible spectrum of electromagnetic waves of solar radiation. Official key: C.**

UPSC Civil Services Prelims 2023 · General Studies · 2 marks · Geography

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

**Explanation**

**(a)**

Equator gets  $\sim 10 \times$  polar **insolation**. Polar night/day and geometry do not make a clean tenfold total.

**(b)**

Infrared is two-thirds of **insolation**. Solar energy peaks in visible; IR is a large but not this stock fraction as keyed.

**(c) Official key**

Water vapour in the lower air absorbs much of the outgoing / long-wave infrared.

**(d)**

Infrared is part of the visible spectrum. IR is adjacent to visible, not inside it.

**Summary**

Official key is (c). Water vapour, concentrated in the lower troposphere, is a strong absorber of infrared. **Insolation** is not 'ten times' at the equator versus poles as a total; IR is not two-thirds of **insolation** in the sense of (b); infrared is not visible light.

**Related possible facts**

These can be asked in a future Prelims paper.

**Atmospheric window**

Wavelengths where the air is relatively transparent in the IR.

**Insolation**

Incoming solar radiation at the top of the atmosphere or surface, as defined.

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