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Q36

With reference to 'Direct Air Capture', an emerging technology, which of the following statements is/are correct? I. It can be used as a way of carbon sequestration. II. It can be a valuable approach for plastic production and in food processing. III. In aviation, it can be a source of carbon for combining with hydrogen to create synthetic low-carbon fuel. Select the correct answer using the code given below (a) I and II only (b) III only (c) I, II and III (d) None of the above statements is correct Official key: C.

UPSC Civil Services Prelims 2025 · General Studies · 2 marks · Environment and Ecology

Environment, ecology, climate, biodiversity - Prelims GS Paper I.

Explanation

(a)

I and II only. That drops aviation e-fuels. **DAC** carbon plus hydrogen is a standard Power-to-Liquid route.

(b)

III only. Sequestration and use in plastics/food are also correct, not only aviation.

(c) Official key

I, II and III. **DAC** pulls CO₂ from ambient air. That CO₂ can be stored (sequestration), used as a carbon feedstock in plastics and in food-grade carbonation, or combined with hydrogen to make synthetic aviation fuel.

(d)

None. All three uses are on the technology tree.

Summary

- **Official key is (c):** **Direct Air Capture** can sequester CO₂, feed plastics and food processing, and supply carbon for aviation e-fuels. (a) drops aviation; (b) keeps only aviation; (d) empties a technology that does all three.

Related possible facts

These can be asked in a future Prelims paper.

Direct Air Capture (DAC)

Machines that chemically or physically strip CO₂ from ambient air, unlike point-source capture at a chimney.

Point-source CCS

Capture at a steel, cement or power plant. The neighbour of DAC in Prelims.

Power-to-Liquid / e-fuel

Renewable hydrogen + captured CO₂ → syngas → kerosene. Aviation's synthetic-fuel story.

Orca / Mammoth (Climeworks)

Iceland DAC plants often in the news. Storage in basalt.

CDR vs mitigation

Carbon dioxide removal is additional to cutting emissions. DAC is one CDR method.

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