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Q2

Which of the following leaf modifications occur(s) in the desert areas to inhibit water loss? 1. Hard and waxy leaves 2. Tiny leaves 3. Thorns instead of leaves Select the correct answer using the code given below: (a) 2 and 3 only (b) 2 only (c) 3 only (d) 1, 2 and 3 Official key: D.

UPSC Civil Services Prelims 2018 · General Studies · 2 marks · Environment and Ecology
Environment, ecology, climate, biodiversity - Prelims GS Paper I.

Explanation**(a)**

(a) 2 and 3 only. Tiny leaves and thorns do cut transpiration in deserts, but they are not the full set. Hard, waxy cuticles also inhibit water loss, so dropping statement 1 leaves the code incomplete and not the key.

(b)

(b) 2 only. Tiny leaves reduce surface area, yet xerophytes also use waxy surfaces and thorns. Isolating one adaptation understates desert morphology, so this letter is not the key.

(c)

(c) 3 only. Thorns replacing leaves (as in many cacti) are one xerophytic device, not the only one listed. Hard waxy leaves and reduced leaf size also inhibit water loss, so 3-only is not the key.

(d) Official key

(d) 1, 2 and 3. **(d) Official key:** Desert plants reduce transpiration with a thick waxy **cuticle**, tiny or rolled leaves, and thorns instead of leaves. All three modifications in the stem inhibit water loss, so the all-correct code is the stored key.

Summary

Official key is (d) 1, 2 and 3. Xerophytes limit evaporation with hard waxy leaves, reduced leaf area, and thorns in place of leaves. Each listed modification is a genuine desert adaptation. Codes that omit any one of them are incomplete. Honour the stored letter (d).

Related possible facts

These can be asked in a future Prelims paper.

Xerophyte

Plant adapted to dry habitats

Cuticle

Waxy layer that cuts cuticular transpiration

Phylloclade / spine

Stem or thorn substituting for leaves

Stomata in deserts

Often sunken or fewer to save water

CAM photosynthesis

Night stomatal opening in many succulents

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