

BIOLOGY • CLASS 12

13

CHAPTER

Biodiversity and Conservation

NCERT SOLUTIONS

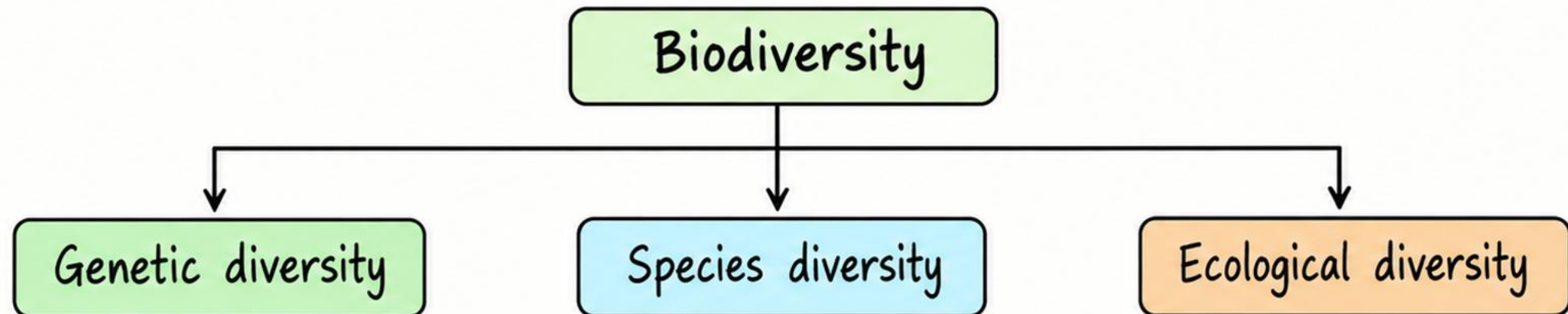


EXERCISE SOLUTION: QUESTION 1

1. Name the three important components of biodiversity.

Answer:

1. **Genetic diversity:** Variation in genes within a species. Different populations or individuals may have different inherited traits.
2. **Species diversity:** The variety of species present in a region, together with their relative abundances.
3. **Ecological diversity:** The variety of ecosystems, habitats and ecological communities in a region.



EXERCISE SOLUTION: QUESTION 2

2. How do ecologists estimate the total number of species present in the world?

Answer:

- They begin with species inventories from sampled areas and well-studied groups, especially insects.
- They compare species richness in tropical and temperate regions.
- Ratios from well-studied groups help estimate richness in less-studied regions and groups.
- These estimates are combined to obtain an approximate global total.
- The result is an estimate, not an exact count: many species are still undescribed.

Historical estimate:

Robert May suggested about 7 million species using such comparisons.

This is the chapter's historical estimate, not a current global census.

EXERCISE SOLUTION: QUESTION 3

3. Give three hypotheses explaining why the tropics show the greatest species richness.

Answer:

1. **Longer evolutionary time:**

Tropical regions were less affected by repeated glaciations than temperate regions. Many lineages had longer uninterrupted periods to diversify.

2. **Stable, less seasonal climate:**

Relatively predictable conditions can favour specialised niches and allow more species to coexist.

3. **Greater energy availability:**

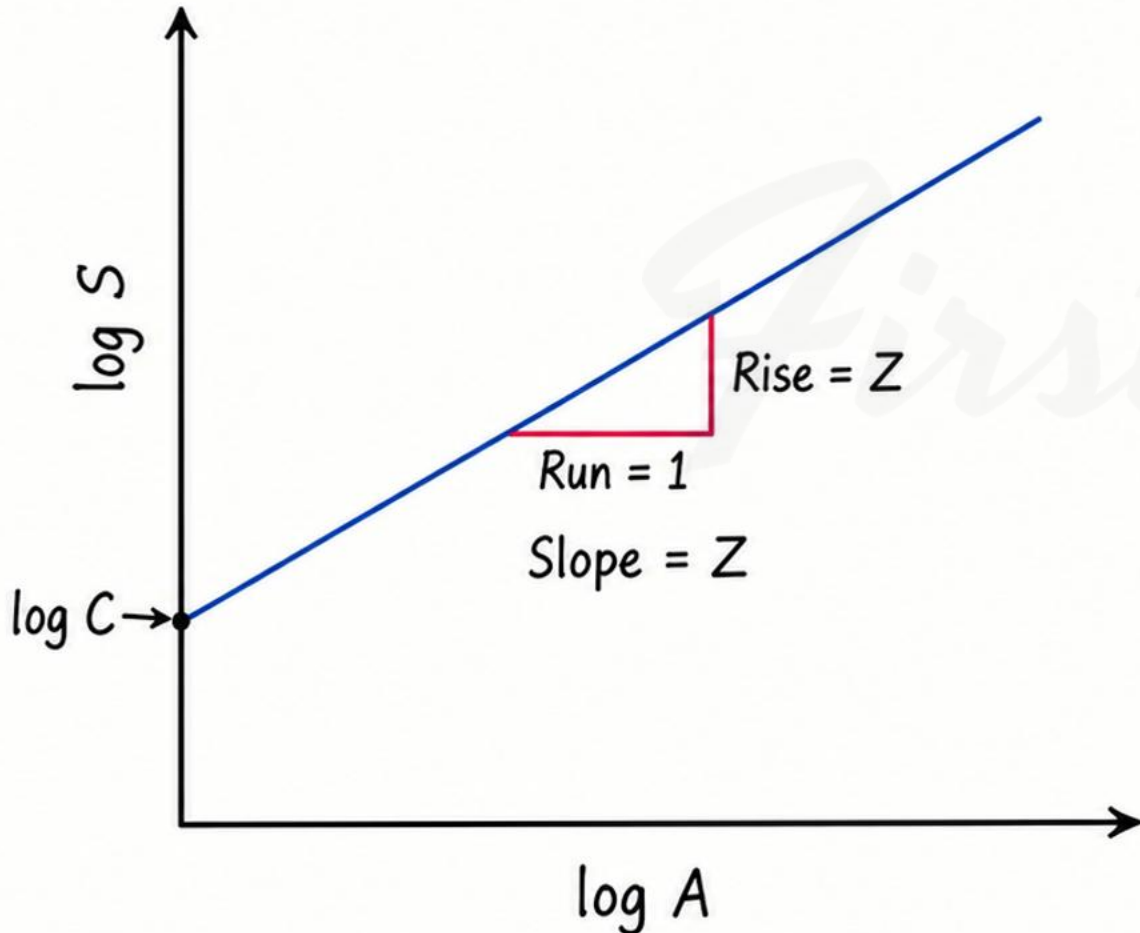
High solar-energy input can support high primary productivity, providing resources for more species.

These explanations are complementary hypotheses; no single factor explains every biodiversity pattern.

EXERCISE SOLUTION: QUESTION 4

4. What is the significance of the slope of regression in a species–area relationship?

Answer:



$$S = CA^Z$$

$$\log S = \log C + Z \log A$$

S = species richness (number of species)

A = area

C = constant

Z = slope (regression coefficient)

The slope shows how rapidly species richness increases as area increases. A steeper slope means a greater increase in richness for the same proportional increase in area.

$Z \approx 0.1 - 0.2$ for many smaller regional comparisons.

$Z \approx 0.6 - 1.2$ for very large areas such as continents.

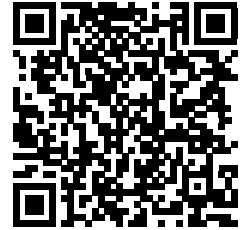


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