Science of Forest Dynamics

Environmental Science · Answer Key · 10 Questions

1. Which process describes the role of forests as a 'carbon sink' in the global climate system?

A) The release of carbon dioxide during microbial decomposition
B) The sequestration of atmospheric CO2 through photosynthesis
C) The conversion of nitrogen into organic biomass
D) The reflection of solar radiation by canopy leaves

2. What is a primary ecological consequence of forest fragmentation?

A) Increased genetic diversity in isolated populations
B) Creation of stable microclimates within core habitats
C) The 'edge effect,' altering light, humidity, and wind patterns
D) Reduction in the speed of secondary forest succession

3. What is the defining characteristic of 'afforestation' compared to 'reforestation'?

A) Planting trees on land that was not previously forested
B) Restoring tree cover to an area that was recently cleared
C) Focusing exclusively on the cultivation of monoculture species
D) Using non-native species to accelerate soil recovery

4. Which soil characteristic is typically degraded immediately following large-scale tropical deforestation?

A) Increased availability of phosphorus and potassium
B) Higher nutrient retention due to increased sunlight
C) Rapid loss of organic matter and increased susceptibility to erosion
D) Enhanced soil permeability due to increased root decay

5. In the context of forest ecology, what does the term 'secondary succession' refer to?

A) The planting of fast-growing commercial timber species
B) The development of an ecosystem on previously vegetated land after a disturbance
C) The initial colonization of bare rock by lichens
D) The stabilization of nitrogen by deep-rooting leguminous trees

6. Which greenhouse gas is primarily released into the atmosphere when forests are cleared and burned?

A) Nitrogen trifluoride
B) Carbon dioxide
C) Chlorofluorocarbons
D) Sulfur hexafluoride

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7. How do tree roots contribute to the hydrological cycle during reforestation?

A) By preventing the infiltration of water into aquifers
B) By increasing the velocity of surface runoff
C) By facilitating groundwater recharge and reducing surface erosion
D) By chemically altering the pH of groundwater

8. What is a significant limitation of using monoculture plantations for ecological reforestation?

A) They reach maturity too slowly compared to natural forests
B) They support lower levels of biodiversity compared to diverse native forests
C) They are unable to sequester carbon in their biomass
D) They require higher soil pH levels than natural forests

9. What does the 'Leaf Area Index' (LAI) measure in a forest ecosystem?

A) The mass of fallen leaves on the forest floor per hectare
B) The one-sided green leaf area per unit ground surface area
C) The rate at which leaves decompose in tropical climates
D) The number of tree species present in a specific canopy layer

10. Which scientific term describes the gradual change in species composition in a forest over time following a disturbance?

A) Ecological succession
B) Biological magnification
C) Trophic cascade
D) Eutrophication

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