

Name: _____ Date: _____

Will Our Systems Survive? Advanced Sustainability Quiz for College Scholars

Scholars synthesize complex socio-ecological indicators and life cycle assessments to evaluate the viability of global resource management frameworks.

1. When conducting a Life Cycle Assessment (LCA) for a nascent bio-plastic technology, which 'system boundary' approach is most rigorous for evaluating long-term carbon sequestration versus methane release in anaerobic environments?

- A. Gate-to-Gate
- B. Cradle-to-Grave
- C. Cradle-to-Cradle
- D. Well-to-Tank

2. In the context of the 'Strong Sustainability' model, the ____ is viewed as a subset of the social system, which is itself a subset of the biophysical environment, implying that natural capital cannot be substituted by human-made capital.

- A. Industrial sector
- B. Economic system
- C. Technological infrastructure
- D. Political framework

3. The 'Jevons Paradox' suggests that increases in resource efficiency will necessarily lead to a decrease in the total rate of consumption of that resource due to market saturation.

- A. True
- B. False

4. Which socio-economic indicator, developed as an alternative to GDP, incorporates 26 different variables to measure the net welfare of a nation by accounting for income inequality and the costs of environmental degradation?

- A. Human Development Index (HDI)
- B. Genuine Progress Indicator (GPI)
- C. Gross National Happiness (GNH)
- D. Environmental Performance Index (EPI)

5. The concept of ____ designates a safe operating space for humanity regarding nine Earth system processes, such as phosphorus and nitrogen cycles, where crossing certain thresholds may trigger non-linear environmental change.

- A. Planetary Boundaries
- B. Ecosystem Services
- C. The Anthropocene Limit
- D. Biocapacity Limits

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6. Assess the 'rebound effect' in the context of urban lighting. If a city replaces all streetlights with high-efficiency LEDs but then uses the saved energy costs to install twice as many lights, what has occurred?

- A. Decoupling
- B. Dematerialization
- C. Direct Rebound Effect
- D. Negative Externality

7. Biomimicry in industrial design focuses exclusively on using organic materials to create products, rather than emulating biological functional patterns.

- A. True
- B. False

8. When a firm externalizes its environmental costs to a third party or the future without compensation, it creates a _____, which leads to market failure and an over-allocation of resources to that activity.

- A. Social Discord
- B. Negative Externality
- C. Price Elasticity
- D. Fiscal Deficit

9. Analyze the 'Tragedy of the Commons' through a modern lense. Which institutional design, proposed by Elinor Ostrom, most effectively prevents the degradation of common-pool resources without total privatization?

- A. Top-down federal regulation
- B. Global carbon taxation
- C. Polycentric governance and local self-organization
- D. Laissez-faire market competition

10. In Industrial Ecology, the 'Extended Producer Responsibility' (EPR) policy shifted the responsibility for post-consumer waste from municipalities back to the original manufacturers.

- A. True
- B. False