Microeconomics in the Natural World

Microeconomics · Answer Key · 14 Questions

1. In the context of foraging behavior, the 'optimal foraging theory' suggests that animals will maximize their net energy gain per unit of time. Which factor is a primary determinant of an animal's decision to switch from one food patch to another?

A) The perceived aesthetic appeal of the next food patch.

B) The time it takes to travel between patches and the diminishing returns within the current patch.

C) The social hierarchy of the animal's group influencing food access.

D) The phase of the moon affecting nutrient availability.

2. The concept of 'tragedy of the commons' describes a situation where individuals acting in their own self-interest deplete a shared, finite resource. Which of the following is a real-world example directly illustrating this principle?

A) A private wildlife sanctuary managed for sustainable tourism.

B) Overfishing in international waters, leading to depleted fish stocks.

C) A regulated national park with strict visitor limits.

D) A company investing in renewable energy sources to reduce pollution.

3. In evolutionary game theory, the 'Hawk-Dove' game models conflict over a resource. A 'dove' strategy involves displaying aggression but retreating if the opponent escalates. Which outcome is most likely when two doves encounter each other?

A) A prolonged, costly fight until one is injured.

B) One dove wins the resource without conflict.

C) Both doves share the resource peacefully, or one retreats without a fight.

D) Both doves fight until one is killed.

4. The 'prey-predator cycle', often observed in populations of rabbits and foxes, demonstrates a dynamic equilibrium. When the prey population increases, what is the typical subsequent effect on the predator population?

A) The predator population declines due to lack of competition.

B) The predator population increases due to a larger food supply.

C) The predator population remains stable regardless of prey numbers.

D) The predator population decreases as they become more selective.

5. Biodiversity can be viewed as a form of 'natural capital.' The loss of a keystone species, such as the sea otter in kelp forest ecosystems, has disproportionately large effects. This illustrates which economic concept?

A) Diminishing marginal returns of biodiversity.
B) Positive externalities of species diversity.
C) The economic value of specialized labor.
D) The impact of externalities and critical thresholds in ecosystems.

6. In behavioral economics, 'habitat choice' in animal populations can be influenced by factors beyond mere resource availability, such as perceived safety or social cues. If a bird species consistently chooses nesting sites in trees with a history of fewer predator attacks, this behavior reflects:

A) A random selection process based on nest availability.
B) Risk aversion and learning from past environmental outcomes.
C) Preference for aesthetically pleasing locations.
D) Innate behavior independent of environmental conditions.

7. The 'coastal zone management' of marine resources, like coral reefs, often involves balancing competing demands from fishing, tourism, and conservation. The concept of 'opportunity cost' is evident when:

A) Increased tourism revenue leads to more jobs.
B) Restricting fishing in a reef area results in lower catches for local fishermen.
C) A new hotel is built adjacent to the reef.
D) The reef's biodiversity increases due to conservation efforts.

8. Pollination services provided by insects are a classic example of a 'positive externality' in agriculture. This means that:

A) Farmers pay insects for pollination.
B) The benefits of pollination extend beyond the farmer who benefits from increased crop yields.
C) Pollination causes negative environmental impacts.
D) Insect populations decrease due to increased farming.

9. The 'supply and demand' for a rare orchid species in the exotic pet trade is influenced by its scarcity and desirability. If the demand for this orchid surges, while its natural population remains limited and difficult to cultivate, what is the most likely immediate market outcome?

A) The price of the orchid will decrease.
B) The price of the orchid will increase significantly.
C) The supply of the orchid will rapidly increase to meet demand.
D) The orchid will become widely available at a low cost.

10. The principle of 'scarcity' is fundamental to microeconomics. In the natural world, the limited availability of fresh water in arid regions creates a high economic value for this resource. This high value is a direct result of:

A) Abundant rainfall in neighboring regions.
B) High demand for water coupled with limited supply.
C) Low population density in the arid region.
D) The ease with which water can be transported from other areas.

11. The 'precautionary principle' is often applied in environmental economics when there is scientific uncertainty about the potential harm of a new activity. For example, the introduction of a non-native species might be restricted based on this principle because:

A) The species is known to be beneficial to the local ecosystem.
B) There is a low probability of the species causing ecological damage.
C) Potential irreversible negative impacts are possible, even if not fully proven.
D) The species provides a new source of revenue.

12. In the study of animal communication, signals often evolve to be honest indicators of an individual's quality (e.g., a peacock's tail). This relates to the economic concept of:

A) Information asymmetry.
B) Moral hazard.
C) Adverse selection.
D) Signaling and credible commitments.

13. The concept of 'market failure' occurs when the free market fails to allocate resources efficiently. In the case of air pollution from factories, this is a market failure because:

A) The factory owners are making excessive profits.
B) The cost of pollution is borne by society, not just the polluting factory.
C) The factory produces a desirable good for consumers.
D) The government subsidizes the factory's production.

14. The 'tipping point' in environmental systems, like the Amazon rainforest potentially transitioning to savanna, represents a critical threshold. Economically, reaching such a tipping point implies:

A) A gradual and reversible change in the ecosystem.
B) A sudden and potentially irreversible shift with significant economic consequences.
C) An increase in resource availability for human exploitation.
D) A stable state with predictable future outcomes.