

CLASS 10

SCIENCE

EXTRA QUESTIONS

Class 10 Science Chapter 13 Our Environment Extra Questions (HOTS)

Genuinely harder, HOTS-level practice for Class 10 Science Chapter 13 (Our Environment), going beyond the standard exercise. These Class 10 Science Chapter 13 important questions are handy for last-minute exam practice.

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Q1 (Assertion-Reason). Assertion (A): DDT concentration is highest in top-level carnivores in a food chain. Reason (R): DDT is biodegradable and is broken down rapidly at each trophic level.

Solution: DDT is actually non-biodegradable and accumulates rather than breaking down, so R is false, though A is true (this is exactly what biological magnification predicts). **Answer: A is true, R is false.**

Q2 (Case-based). A pond ecosystem has algae, small fish that eat algae, and large fish that eat small fish. A pesticide sprayed on nearby fields washes into the pond. Which organism accumulates the highest pesticide concentration, and why?

Solution: The large fish (the top consumer in this chain). Algae absorb a small amount of pesticide from the water; each small fish eats many algae, concentrating that pesticide in its own tissue; each large fish eats many small fish, further concentrating it. This stepwise concentration increase up the food chain is biological magnification.

Q3 (Comparison). Compare food chains and food webs.

Solution: A food chain is a single, straight-line sequence of who-eats-whom (e.g. grass → deer → tiger). A food web is a network of many interconnected food chains in an ecosystem, since most organisms eat and are eaten by more than one species. Food webs are more realistic and make an ecosystem more stable, because if one food source is lost, a consumer can often switch to another.

Q4 (Applied reasoning). Only about 10% of the energy at one trophic level is available to the next (the 10% law). Explain why food chains rarely have more than 4-5 trophic levels.

Solution: At each step, roughly 90% of the energy is lost as heat (through respiration, movement, and other life processes) and only about 10% is stored in body tissue and passed on. After 4-5 levels, the energy remaining is too little to support a viable population at the next level, which is why food chains are naturally short.

Q5 (Concept). Segregating waste into “wet” (biodegradable) and “dry” (non-biodegradable) bins at home is now common. Explain the environmental benefit of this practice.

Solution: Wet/biodegradable waste can be composted or processed separately (e.g. into biogas or manure) instead of being landfilled, where it would otherwise rot anaerobically and release methane. Dry/non-biodegradable waste, kept uncontaminated by food waste, can be sorted and recycled far more efficiently (paper, plastic, metal, glass), reducing both landfill volume and the extraction of fresh raw materials.

Q6 (Reasoning). Why are decomposers sometimes called “nature’s recyclers,” and what would happen to an ecosystem if they suddenly disappeared?

Solution: Decomposers break down dead organic matter into simple inorganic nutrients (like nitrates and minerals) that plants can absorb again, completing the cycle of matter through the ecosystem. Without them, dead bodies and waste would pile up indefinitely, nutrients would stay locked away instead of being returned to the soil, and producers would eventually be starved of the raw materials they need to grow.