



Attempt questions first; check the separate key afterward. Show all working. Draw accurate figures where required.

A. Very short answers - 1 mark each

1. Name organisms that make food from inorganic substances using sunlight.
2. Distinguish producers, consumers and decomposers.
3. Which trophic level is occupied by herbivores?
4. Construct a four-level terrestrial food chain.
5. About what fraction of energy transfers to the next trophic level in the simplified model?
6. Producers contain 10000 J. Find energy at secondary consumers.
7. If primary consumers receive 500 J, estimate producer energy.
8. Estimate energy reaching tertiary consumers in that chain.

B. Short answers / practice - 2 marks each

9. Is energy flow in an ecosystem cyclic?
10. Explain why food chains usually have few trophic levels.
11. What is a food web?
12. Explain why a food web can increase ecosystem stability.
13. Name the accumulation of persistent pollutants up food chains.
14. Explain why top predators can show high pesticide concentrations.
15. What is the molecular formula of ozone?
16. Explain the protective role of stratospheric ozone.
17. Name a group of chemicals historically linked to ozone depletion.
18. Distinguish ozone depletion from global warming.
19. Is a vegetable peel usually biodegradable?
20. Is ordinary polyethylene rapidly biodegradable?

C. Application / reasoning - 3 marks each

21. Name two abiotic components of an ecosystem.
22. Explain how abiotic factors influence organism distribution.
23. Do decomposers recycle nutrients?
24. Explain what would happen if decomposers were absent.
25. A food chain has grass→insect→frog→snake. Which is the secondary consumer?
26. Predict two possible effects of a large decline in frogs.
27. A food chain begins with 50000 J at producers. Estimate energy at tertiary consumers using the 10% model.
28. Why can persistent pesticides enter humans through several different food chains?
29. Does biodegradable waste always cause no pollution, regardless of amount or disposal?
30. Distinguish a trophic level from an organism's species identity.
31. Explain why reducing waste at its source is useful even when recycling facilities exist.

D. Extended practice - 5 marks per pair

32. Should batteries be mixed with kitchen compost?
33. Propose a school waste-segregation plan for organic, recyclable and hazardous waste.
34. Can both a pond and an aquarium be ecosystems?
35. Compare natural and artificial ecosystems and explain how human actions can disturb their balance.

ANSWER KEY - Numerical / closed questions

- 1) Producers. 3) Second. 5) 10%. 6) 100 J. 7) 5000 J. 8) 5 J. 9) No; unidirectional. 13) Biomagnification. 15) O₃. 17) CFCs. 19) Yes. 20) No. 21) Examples: light, water, temperature, soil. 23) Yes. 25) Frog. 27) 50 J. 29) No. 32) No. 34) Yes.