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What this file is. A sample chapter from our BEVAE-181 help book (English medium): short notes on one topic followed by exam-style questions with answers. Our printed help books cost Rs 149 per subject plus Rs 100 postage per order, or Rs 99 per subject as a PDF.

How it was prepared. Written at our desk from the BEVAE-181 syllabus area on ecosystems (Ability Enhancement Compulsory Course on Environmental Studies, IGNOU) and standard ecology facts. Drafting was AI-assisted; every rule stated was checked against the documents named, and the file is published under the editorial responsibility of BK Sahni, founder. Prepared November 2026.

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BEVAE-181 Environmental Studies: Ecosystem, structure and function

Key ideas

- **Ecosystem.** A community of living organisms interacting with each other and with their non-living surroundings as one unit. The term was proposed by the British ecologist A. G. Tansley in 1935.
- **Abiotic components.** Sunlight, temperature, water, air, soil and minerals.
- **Biotic components.** Producers (green plants and algae that make food by photosynthesis), consumers (herbivores as primary consumers, carnivores as secondary and tertiary consumers) and decomposers (bacteria and fungi that break down dead matter and return nutrients to the soil).
- **Food chain and food web.** A food chain is one path of energy from producer to top consumer (grass, grasshopper, frog, snake, hawk). Many interlinked chains form a food web, which makes an ecosystem more stable.
- **Trophic levels.** Producers form level I, primary consumers level II, secondary consumers level III, and so on.
- **Energy flow.** Energy flows one way. Only about 10 percent of the energy at one trophic level passes to the next (the ten percent law, after R. L. Lindeman); the rest is lost mainly as heat in respiration.
- **Ecological pyramids.** Pyramids of number, biomass and energy. The pyramid of energy is always upright; pyramids of number and biomass can be inverted (a tree supporting many insects; phytoplankton supporting a larger biomass of zooplankton at a given moment).
- **Types.** Terrestrial (forest, grassland, desert) and aquatic. Aquatic ecosystems are freshwater (lentic, standing water such as ponds and lakes; lotic, flowing water such as rivers and streams) or marine.

Questions with answers

Q1. Distinguish between a grazing food chain and a detritus food chain.

A grazing food chain starts with living green plants, which are eaten by herbivores and then by carnivores (grass, deer, tiger). A detritus food chain starts with dead and decaying organic matter, which is used by detritivores and decomposers such as earthworms, bacteria and fungi, and then by their predators. In a forest floor, most energy may pass through the detritus chain.

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Q2. Why is the pyramid of energy always upright?

Because energy is lost at every transfer. Each higher trophic level receives only a small fraction of the energy of the level below it, so the energy content can never be larger at a higher level.

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Pyramids of number and biomass can be inverted; the energy pyramid cannot.

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Q3. What role do decomposers play in an ecosystem?

Decomposers break down dead plants, animals and wastes into simpler substances. This releases nutrients such as nitrogen and phosphorus back into the soil and water, where producers take them up again. Without decomposers, nutrients would stay locked in dead matter and the cycling of materials would stop.

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