

Ecosystem — CBSE Pattern Test 1

Class 12 Biology · 90 minutes · 40 marks · Sections A–D with answer key · Narayan Gurukul Academy

Test 1 — CBSE Pattern (90 minutes, 40 marks)

Class 12 Biology · Ecosystem · Narayan Gurukul Academy (ClassApna)

General Instructions: (1) This paper has four sections — Section A (1×10), Section B (2×4), Section C (3×4) and Section D (5×2) — total 40 marks. Time allowed: 90 minutes.
(2) All questions are compulsory. No overall choice is given; internal choice, where allowed, is clearly marked.
(3) For MCQ questions choose the single correct option; for VSA answers write a single line.
(4) Take $g = 10 \text{ m/s}^2$. All symbols carry their usual meaning. Use of a calculator is not permitted.

Section A — MCQ & VSA ($10 \times 1 = 10$ marks)

- The pyramid of energy is always
 - upright
 - inverted
 - spindle-shaped
 - flat
- The 10% law of energy flow was given by
 - Lindeman
 - Darwin
 - Odum
 - Tansley
- The phosphorus cycle is
 - sedimentary
 - gaseous
 - both
 - neither
- The first organism to colonise a bare area is a
 - pioneer species
 - climax species
 - consumer
 - decomposer
- Decomposition is affected by
 - temperature and oxygen
 - colour
 - sound
 - shape
- NPP equals
 - $GPP - R$
 - $GPP + R$
 - $GPP \times R$
 - GPP / R
- In a sea ecosystem, the pyramid of biomass is
 - inverted

- (B) upright
 - (C) flat
 - (D) absent
8. The stable end stage of succession is the
- (A) climax community
 - (B) pioneer community
 - (C) sere
 - (D) niche
9. What is an ecosystem?
10. What is humus?

Section B — Short Answer I ($4 \times 2 = 8$ marks)

11. Define gross primary productivity.
12. What is the 10% law?
13. Is the phosphorus cycle gaseous or sedimentary?
14. What is a pioneer species?

Section C — Short Answer II ($4 \times 3 = 12$ marks)

15. Describe the structure of an ecosystem.
16. Explain the relationship between GPP, NPP and respiration.
17. Describe the steps of decomposition.
18. Differentiate between primary and secondary succession.

Section D — Long Answers ($2 \times 5 = 10$ marks)

19. (a) Describe productivity and energy flow in an ecosystem. (b) Describe the types of ecological pyramids.
20. (a) Describe the steps of decomposition and the factors affecting it. (b) Describe nutrient cycling with examples.

Answer Key (Marking Scheme)

- Q1 — (A) upright. Q2 — (A) Lindeman. Q3 — (A) sedimentary. Q4 — (A) pioneer species. Q5 — (A) temperature and oxygen. Q6 — (A) $GPP - R$. Q7 — (A) inverted. Q8 — (A) climax community.
- Q9 — An ecosystem is a functional unit of nature where organisms interact with each other and the environment.
- Q10 — Humus is dark organic matter formed during decomposition.
- Q11 — GPP is the total organic matter produced by photosynthesis.
- Q12 — About 10% of energy is transferred from one trophic level to the next.
- Q13 — Sedimentary.
- Q14 — The first organism to colonise a bare area (e.g. lichens).
- Q15 — Biotic (producers, consumers, decomposers) and abiotic components with stratification.
- Q16 — $NPP = GPP - R$.
- Q17 — Fragmentation → leaching → catabolism → humification → mineralisation.
- Q18 — Primary begins on a bare area with no soil; secondary begins where soil already exists.
- Q19 — (a) GPP/NPP and unidirectional energy flow with the 10% law. (b) Number, biomass and energy pyramids.

Q20 — (a) Five steps; factors: temperature, oxygen and detritus composition. (b) Gaseous (carbon, nitrogen) and sedimentary (phosphorus) cycles.