

Organisms and Populations — 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 · Organisms and Populations · 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 logistic growth model uses the constant
 - K
 - r only
 - N only
 - T
- Cuscuta is an example of
 - parasitism
 - mutualism
 - commensalism
 - predation
- The interaction in which both species benefit is
 - mutualism
 - commensalism
 - parasitism
 - predation
- Winter dormancy in animals is called
 - hibernation
 - aestivation
 - diapause
 - migration
- The density of a population is measured as
 - individuals per unit area
 - total mass
 - total energy
 - total biomass only
- Animals that maintain a constant internal environment are
 - regulators
 - conformers
 - migrators
 - hibernators
- Camels are adapted to
 - deserts

- (B) polar regions
 - (C) oceans
 - (D) rainforests
8. The carrying capacity is represented by
- (A) K
 - (B) r
 - (C) N
 - (D) t
9. What is population density?
10. Define commensalism.

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

11. What is an ecological niche?
12. Name the major abiotic factors.
13. What is natality?
14. What is the exponential growth equation?

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

15. Describe the responses of organisms to abiotic stress.
16. Describe the attributes of a population.
17. Explain the exponential and logistic growth models.
18. Describe the major population interactions with examples.

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

19. (a) Describe the adaptations of organisms to their environment. (b) Describe the major abiotic factors that affect organisms.
20. (a) Explain population growth models. (b) Explain the major population interactions with suitable examples.

Answer Key (Marking Scheme)

- Q1 — (A) K. Q2 — (A) parasitism. Q3 — (A) mutualism. Q4 — (A) hibernation. Q5 — (A) individuals per unit area. Q6 — (A) regulators. Q7 — (A) deserts. Q8 — (A) K.
- Q9 — Population density is the number of individuals per unit area or volume.
- Q10 — Commensalism is a $+/0$ interaction where one species benefits and the other is unaffected.
- Q11 — The functional role and position of a species in its ecosystem.
- Q12 — Temperature, water, light and soil.
- Q13 — Natality is the birth rate.
- Q14 — $dN/dt = rN$.
- Q15 — Conformers, regulators, hibernation, aestivation, diapause and migration.
- Q16 — Density, natality, mortality, age distribution and sex ratio.
- Q17 — Exponential: $dN/dt = rN$; logistic: $dN/dt = rN[(K - N)/K]$.
- Q18 — Mutualism ($+/+$), commensalism ($+/0$), predation/parasitism ($+/-$), competition ($-/-$).

Q19 — (a) Structural, physiological and behavioural adaptations. (b) Temperature, water, light, soil.

Q20 — (a) Exponential (unlimited) and logistic (limited by K). (b) Examples for each interaction.