

ORGANISMS, POPULATIONS AND COMMUNITIES QUESTIONS

1. Define: (a) ecology (b) biotic (c) abiotic (d) environment (e) habitat (f) niche (g) community (h) population (i) population density (j) transient population (k) carrying capacity (l) adaptation.
2. Name and give an example of each type of adaptation.
3. Classify each stated adaptation as structural, physiological or behavioural: (a) Some mammals of cold climates hibernate. During the winter, their body temperatures fall to a little above their surroundings, and their metabolic rates drop markedly. (b) African elephants wet the skin in hot weather. (c) Sharks have a streamlined shape to swim faster. (d) Some desert animals live in burrows through the day and emerge at night to feed.
4. State the factors which affect population.
5. Why do weeds grow so well in your garden while expensive plants bought from the nursery do not?
6. A biologist studying the roots of a population of plants found that roots of certain individuals grew more rapidly than those of others. How might this characteristic affect the chances of survival of such a plant?
7. Many organisms in a population die before they can reproduce. Explain how this can influence the characteristics of the next generation.
8. Explain the formula - Population Change = (B + I) - (D + E)
9. At the beginning of the year, there were 2000 individuals. During the year, 1700 individuals died, 240 migrated into the area, 601 moved out, and 870 were born. What is the overall change in the population by the end of the year?
10. Describe the two methods of sampling populations : (a) sampling quadrats (b) mark and recapture.
11. If there are 200 kangaroos in a population spread over 25 square kilometres, what is the population density?
12. How do biologists name communities? Give an example.
13. Do the species present in a community change with time? Give examples to explain.
14. Describe the habitat of : (a) a green tree frog (b) an oyster (c) a deep sea viperfish.

15. Explain the cause of : (a) seasons (b) tides.
16. What is the difference between diurnal and nocturnal animals? Give examples.
17. List 4 abiotic factors in an environment which is: (a) terrestrial (b) aquatic.
18. One seedling begins growth in an open ploughed paddock and another seedling begins growth in a dense forest. Discuss the chances of survival of each.
19. (a) In a cup of black instant coffee, what are the solute, the solvent and the solution?
- (b) Most freshwater organisms die when placed in seawater. Most marine organisms die when placed in fresh water. What causes their deaths?
20. An organism cannot survive for long if the physical or abiotic conditions are outside its tolerance limits. Explain.
21. Define, and give examples where necessary: (a) competition (b) predation (c) symbiosis (d) parasitism (e) mutualism (f) commensalism.
22. For what types of requirements do organisms compete?
23. Classify each of these symbiotic relationships as parasitic, mutualistic or commensal : (a) the dog and its fleas (b) the wild passionfruit vine and the eucalypt tree (c) the shark and the remora.
24. Define: (a) autotroph (b) heterotroph (c) producer (d) consumer (e) herbivore (f) carnivore (g) omnivore (h) parasite (i) detritivore (j) scavenger (k) decomposer (l) food chain (m) food web (n) trophic level (o) biomass.
25. Explain why all life on earth is ultimately dependent on a continued supply of sunlight.
26. There are many underground caves in limestone rocks in parts of southern Australia. In most of these, water soaks through the porous rock from above, bringing with it particles of dead organic matter, chiefly plant material from the surface. The roof of many caves is very damp, and covered by a layer of mould growing on the organic matter which has seeped through. Feeding on the mould, in the pitch darkness, are cave crickets. On the wet floor of the caves are cave frogs which feed on the cave crickets when they fall from the roof or wander within reach of the frog's long sticky tongue.
- (a) There are no producer organisms in this community. How is it that the community can exist without them?

- (b) Draw a food chain for this community.
- (c) Identify the first and second order consumers.
- (d) What would happen to the community if the frogs were to die?
- (e) What would happen to the community if another animal was introduced to the caves and could catch crickets more easily than could the cave frogs?

27. In a heathland, five groups of animals were sorted according to their diet. Draw a food web for this information.

Foliage feeders - grasshoppers, leaf beetles, shield bugs, case-moth larvae

Sap of old wood - issids (a type of plant bug)

Nectar feeders - native bees, ants, mites

Predators - wolf-spiders, scrub-wrens

Freshwater plant material - larvae of midges.

28. What usually happens to the biomass at each trophic level?

29. What is succession? Give an example.

30. Many Australian native seeds germinate only after bushfire. How do nurserymen simulate these conditions in order to germinate these seeds in the plant nursery?