

CLASSIFICATION OF ORGANISMS QUESTIONS

1. List and discuss the characteristics of living things.
2. Define these terms: (a) organic (b) inorganic (c) respiration (d) photosynthesis (e) autotrophic (f) photosynthetic (g) chemosynthetic (h) heterotrophic (i) saprophytic (j) parasitic (k) pathogenic (l) prokaryotic (m) eukaryotic (n) unicellular (o) multicellular.
3. Write the general equations for: (a) respiration (b) photosynthesis.
4. (a) Define species.
(b) Why do biologists try to describe and name different species of organism?
(c) How does a biologist decide whether two similar organisms belong in the same species or in different species?
5. Which of the following features of an organism would biologists use to identify an organism - colour, bark type, number of appendages, type of skeleton, habitat, body temperature and skin covering?
6. Why use scientific names when there are plenty of good English and Australian names available to name organisms?
7. (a) The mnemonic "King Paul Cries Out For Good Soup" helps students to remember the order of groups in the 5-Kingdom classification system. For what does it stand?
(b) Which group has organisms that are the most diverse from each other?
(c) Briefly name and describe the 5 kingdoms.
8. (a) Name the biologist who developed the binomial classification system.
(b) Give an example to explain what is meant by a binomial system of naming organisms.
(c) Many aboriginal people are much better than people of European descent at recognising Australian plants and animals. The classification system developed by aboriginal people is obviously different from that developed by Linnaeus. Explain how two very different but successful systems came to exist.
8. (d) What is the name given to the branching identification system where a selection between two features is made at each step?
9. What are the common names for : (a) *Canis familiaris* (b) *Callistemon linearis*?

10. Some biologists have been studying 4 different groups of frogs. Group A interbreeds with group B under natural conditions. Similarly group B interbreeds with group C. Group A does not interbreed with group C because they do not live in the same locality. In wet seasons, group D migrates into the same area as group C and interbreeds with it. How many species of frogs are involved in this study?
11. (a) What are the main similarities and differences between the kingdoms Monera and Protista?
- (b) Give 2 examples of members of the kingdoms Monera and Protista.
- (c) By what features are bacteria classified?
- (d) Discuss the relevant arguments for classifying blue-green algae or cyanobacteria as Monerans and Plants.
- (e) Discuss the relevant arguments for classifying *Euglena* as Animals, Plants and Protists.
- (f) Some biologists believe that eukaryotes evolved from prokaryotes. What evidence do they put forward to support their theory?
12. Describe the following locomotive structures: (a) flagellum (b) cilia (c) pseudopodium.
13. What is the purpose of a contractile vacuole in freshwater protists such as *Paramecium*?
14. (a) Describe some similarities and differences between Fungi and Plants.
- (b) What is a fruiting body, and how does it differ from a true fruit?
15. Why do biologists have difficulty classifying lichens, slime moulds and viruses?
16. (a) What is the main characteristic used to classify algae?
- (b) Do all algae contain chlorophyll?
17. (a) Why are algae and bryophytes termed non-vascular?
- (b) Non-vascular plants are small in size. Explain why.
- (c) What is the difference between a rhizoid and a true root?
- (d) In what way might bryophytes qualify for the title “amphibians of the plant world”?
- (e) Both bryophytes and ferns reproduce by spores. Why are they classified in different phyla?

18. (a) The derivation of the term “Tracheophyta” is from “tracheia” meaning “windpipe” and “phyton” meaning “plant”. What characteristics are common to all tracheophytes?
- (b) What are the 5 main classes of tracheophytes?
- (c) Which tracheophytes produce spores and not seeds?
- (d) Which tracheophytes are called gymnosperms (with “naked” seeds)?
- (e) Which tracheophytes are called angiosperms (with “enclosed” seeds)?
19. (a) Describe the habitat of members of Class Filicopsida.
- (b) What is meant by a sorus, and what is its function?
- (c) What is a prothallium?
- (d) Some ferns are epiphytic. What does this mean?
20. Give the common names of some members of : (a) Class Coniferopsida (b) Class Angiospermae.
21. Gymnosperms have their ovules containing seeds exposed on the surface of specialised, scale-like leaves arranged into cones. How does this differ from the arrangement of seeds in angiosperms?
22. Angiosperms are divided into 2 subclasses of Monocotyledons and Dicotyledons.
- (a) Describe the differences between these.
- (b) Give examples of each.
23. Rearrange in chronological order of formation - fruit, flower, seed, embryo, seedling.
24. In inland Australia, there are a number of different types of bushes classified into the tomato family. Two species in the same genus produce very similar small orange fruits. One is edible and is used by the aborigines as “bush-tucker”, while the other is highly toxic. Aboriginal children have to learn which is which. Which of the following characteristics do you think would help them distinguish between these two plants - the number of stamens, whether the petals are joined or free, whether the ovary is superior or inferior, the shape of the leaves, the presence or absence of spines on the stem or the height of the plant?
25. If you found brown spots on the undersides of leaves of a fern, how could you determine if the spots were sori containing spores or a sign of disease?
26. For each phylum and class of the animal kingdom that you have learnt, give a brief description of the characteristics and an example.

27. An animal is multicellular, has no digestive system and its body is perforated with pores. What is it?
28. (a) Why is the name "jellyfish" incorrect?
(b) Hydra, jellyfish and coral were previously classified as Phylum Coelenterata, and are now classified as Phylum Cnidaria. Explain.
29. A multicellular animal is radially symmetrical, has a well-developed gut but simple nervous and circulatory systems, moves slowly using arms, and an internal calcium carbonate plate. What is it?
30. Why do you suppose echinoderms are found only in the sea?
31. What are the advantages and disadvantages of animals such as many flatworms being hermaphrodites?
32. *Peripatus*, the velvet worm, is soft-bodied and elongated like a worm, but has unjointed paired legs. Would classify it as annelid, arthropod or in a phylum of its own? Explain.
33. Give an example of a mollusc which has: (a) no shell (b) one valve (c) two valves.
34. Although some molluscs such as snails are hermaphrodites, many have separate sexes and some exhibit courtship behaviour. What are the advantages and disadvantages of separate sexes?
35. What is it - it has a radula and simple digestive system, an organised nervous system, a soft body, and members of its phylum are found in both terrestrial and aquatic habitats?
36. What are the distinguishing features of several classes of arthropods, and what is an example of each?
37. Into which arthropod class does each of these belong: (a) millipede (b) lobster (c) grasshopper (d) butterfly (e) barnacle (f) Redback spider (g) centipede (h) bee (i) tick?
38. Each of these pairs of arthropods is in a separate class from each other. Explain why.
(a) spider and cockroach (b) lobster and millipede.
39. An animal is bilaterally symmetrical, has an exoskeleton, jointed appendages, two pairs of antennae, pincers (chelae) and gills. To which phylum and class does it belong?
40. What distinguishes a centipede from a millipede?
41. What are the different castes of the honeybees?

42. Many sessile (fixed) and slow-moving animals are radially symmetrical. Unattached, fast-moving animals are usually bilaterally symmetrical. What reasonable explanation can you offer for this observation?
43. The subphylum Vertebrata has many features. Name at least five.
44. Into which vertebrate class would you classify these animals? If the animal is a mammal, also specify if it is monotreme, marsupial or placental.
(a) lamprey (b) stingray (c) elephant (d) wolf (e) shark (f) bandicoot (g) platypus (h) barramundi (i) toad (j) kookaburra (k) snake (l) turtle (m) whale (n) salamander (o) lizard (p) penguin (q) wombat (r) echidna (s) human?
45. What are the differences in gill structure and the vertebral structure of the cartilaginous and the bony fish?
46. Which of the vertebrates have a: (a) changing body temperature (ectothermic or “cold-blooded”) (b) constant body temperature (endothermic or “warm-blooded”) ?
47. Why is it incorrect to use the terms “cold-blooded” and “warm-blooded”?
48. A student beginning her biology studies said that “Amphibians live in water and on land”. Do you agree or disagree with this statement? Explain.
49. What is it - it has no sweat glands but has a constant body temperature, lays hard-shelled eggs, has no teeth, and has scales on its clawed feet?