

Chapter 8. Five Kingdom Classification

Exercise 1

Solution A.

1. (d) vertebrates and invertebrates
2. (d) Bat, Parrot, Oyster – Vertebrates
3. (c) Rana tigrina
4. (d) Mule is neither a donkey nor a horse.

Solution B.1.

Carolus Linnaeus had introduced the binomial system of naming living beings.

Solution B.2.

The two characters common to dog, humans, squirrel, bat, camel and monkey are:

- (c) external ears
(d) give birth to young ones

Solution B.3.

Column I	Column II
1.Pine	(iv) Gymnosperm (v) Plantae
2. Earthworm	(vi) Animalia
3. Bread mould	(i) Fungi
4. <i>Amoeba</i>	(vii) Protista
5. Moss	(v) Plantae (viii) Bryophyta
6.Bacteria	(ii) Monera (iii) Prokaryote

Solution C.1.

Phylum → Class → Order → Family → Genus → Species

Solution C.2.

Man	Domestic cat	Peepal tree

Homo sapiens

Felis domesticus

Ficus religiosa

Solution C.3.

In science, people from different countries with different languages have to read about each others research. So, it was necessary to eliminate any possible confusion created by local names. Scientific names are based on certain rules which are universal. They are unique and can be used to identify an organism anywhere around the world. That is why, scientific names of living beings are considered better than their common names.

Solution C.4.

According to the 'Two-Kingdom Classification', proposed by Carolus Linnaeus in 1758, living organisms were classified into two broad kingdoms, Plants and Animals.

The drawbacks in classifying organisms under the old two kingdom classification are:

1. Bacteria were kept in Kingdom Plantae. These organisms have no chlorophyll and do not carry out photosynthesis. Bacteria do not have a definite nucleus nor a nuclear membrane nor chromosomes.
2. Fungi were kept in Kingdom Plantae. Bread mould is a multicellular fungi. However, it does not possess roots, stem and leaves, lacks chlorophyll and does bear any flowers, fruits and seeds like plants.

Solution C.5.

Species means an organism of a particular kind whose members can interbreed among themselves to produce fertile young ones.

All humans on the earth today may differ widely in their facial features, colour, height, etc. Yet, they belong to a single species *Homo sapiens* because they can interbreed among themselves and produce a normal offspring.

Solution C.6.

Ficus religiosa (Peepal)
Zea mays (Maize)
Bombyx mori (Silkmoth)

Solution C.7.

The five kingdoms according to the new classification are:

1. Kingdom Monera
2. Kingdom Protista
3. Kingdom Fungi
4. Kingdom Plantae
5. Kingdom Animalia

Solution C.8.

- (a) Animals with a backbone: Vertebrata
(b) Animals with a hairy skin: Mammalia

(c) Animals with three pairs of legs: Insecta

(d) Animals with feathers: Aves

Solution C.9.

Invertebrate animals:

1. Housefly
2. Silverfish
3. Jellyfish
4. Sponge

Solution C.10.

(a) Protozoa and Metazoa

Protozoa	Metazoa
Unicellular organisms	Multi-cellular organisms

(b) Vertebrate and Invertebrate

Vertebrates	Invertebrates
Have their unique backbone with the spinal cord	Do not have a backbone

(c) Insecta and Arachnida

Insecta	Arachnida
Have three pairs of legs	Have four pairs of legs

(d) Flatworm and Roundworm

Flatworm	Roundworm
Dorso-ventrally flattened	Cylindrical in shape and are tapered at both ends

Solution C.11.

- (i) Amoeba – Nucleus, tentacle, food vacuole
- (ii) Hydra – Invertebrata, Cnidaria, Crustacea
- (iii) Fish – Gills, paired fins, ear drum
- (iv) Earthworm – Invertebrata, Annelida, Insecta
- (v) Grasshopper – Wings, trachea, proboscis
- (vi) Butterfly – Insecta, Invertebrata, Mollusca
- (vii) Whale – Gills, mammary glands, fat under the skin
- (viii) Pigeon – Feathers, wings, hair

(ix) Monkey – External ear, sweat glands, lateral line

(x) Bat – Aves, Mammalia, Chordata

Solution C.12.

Cold-blooded animals	Warm-blooded animals
These animals cannot maintain their body temperature. Their body temperature is regulated by the external environment.	Animals whose body temperature is kept relatively constant by internal mechanisms.
E.g. Insects, Amphibians	E.g. Birds, Mammals

Solution C.13.

1. Class Amphibia: Tree frog
2. Class Reptilia: Cobra
3. Class Aves: Duck

Solution D.1.

(a) Insects and Birds

Similarity	Difference	
Have wings	Insects	Birds
	Invertebrates	Vertebrates

(b) Whales and Fishes

Similarity	Difference	
Aquatic	Whales	Fishes
	Have lungs for breathing	Have gills for breathing

(c) Snakes and Earthworms

Similarity	Difference	
Do not have any limbs	Snakes	Earthworm
	Vertebrates	Invertebrates

(d) Bat and Pigeon

Similarity	Difference	
Breathe through lungs	Bat	Pigeon
	Have external	Have internal

	ears	ears
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(e) Cuttlefish and Dogfish

Similarity	Difference	
Marine animals	Cuttlefish	Dogfish
	Invertebrates	Vertebrates

(f) Wall lizard and Frog

Similarity	Difference	
Cold-blooded animals	Wall lizard	Frog
	Completely adapted to life on land	Live partly on land and partly in water

Solution D.2.

Column I	Column II
Annelida	Earthworm
Porifera	Sponge
Mollusca	Octopus
Reptilia	Snake
Pisces	Trout
Mammal	Rabbit

Amphibia from Column I and Pigeon from column II are left out. They do not match as Pigeon comes under Class Aves and not Class Amphibia.

Solution E.

No, it is not a relative of Kangaroo as Kangaroo is a mammal and Tyrannosaurus is a reptile.

Characteristics of Tyrannosaurus:

1. Body has scales which may be horny
2. Lays eggs which have a leathery shell
3. One of the dinosaurs which moved on the earth. These ruled the earth. Some were vegetarian, others were non-vegetarian. Archaeopteryx is a link between reptiles and birds. Its fossils have been found, which vanished from the earth due to ice-age.
4. Had three-chambered heart as ventricles are partially divided
5. Cold-blooded animals