CHAPTER – 7

DIVERSITY IN THE LIVING WORLD

P. 80 Check Your Progress 1

A. Answer these questions.

1. Classification means identifying similarities and differences between different kinds of organisms and then placing organisms with similar characteristics in one group and different kinds of organisms in different groups.
2. Species
3. The three rules are:
   - i. The name of the genus comes first and its first letter is always written in capital letter. The name of the species always comes second and it always starts with a small letter.
   - ii. The scientific name should be written in italics or underlined (separately for genus and species name) if handwritten. Example: *Homo sapiens* or <u>*Homo sapiens*</u>
   - iii. Scientific names are mostly in Greek or Latin and is recognized throughout the world.
4. Five kingdoms of organisms:
   - i. Monera
   - ii. Protista
   - iii. Fungi
   - iv. Plantae
   - v. Animalia

B. Fill in the blanks.

1. genus
2. order
3. kingdom

P. 82 Check Your Progress 2

A. Answer these questions.

1. a. Bacteria, Cyanobacteria (blue-green algae)
   - b. *Amoeba, Paramecium*
   - c. Yeast, mushroom
   - d. Mango plant, wheat plant
   - e. Rabbit, Man
2. Organisms to be classified under kingdom Monera should be prokaryotes. They should be unicellular organisms and should not have a defined nucleus or organelle.

   Organisms under kingdom Protista are unicellular eukaryotic organisms. They have a well-defined nucleus and complex membranous organelles.
3. Kingdom Protista
4. a. Monera
   - b. Protista
   - c. Fungi
   - d. Plantae

P. 86 Check Your Progress 3

A. Answer these questions.

1. i. Multicellular
   - ii. Eukaryotic with cell walls
   - iii. Non-motile
   - iv. Perform photosynthesis due to chlorophyll present in chloroplasts, hence autotrophic.
2. Bryophytes are land plants which grow in moist areas and have no true roots, neither do they have conducting vascular tissues like xylem and phloem. Thus they are called non-vascular cryptogamic plants. They develop a number of hair-like structures known as rhizoids which help in fixing the plant in the soil for absorbing nutrients. They are sometimes called the "amphibians of the plant kingdom" because of their need for moist habitats for sexual reproduction.
3. a. **Bryophyta**
   - i. Have no true roots;
   - ii. Do not have conducting vascular tissues like xylem and phloem; thus they are called non-vascular cryptogamic plants;
   - iii. The plant body is simple, flat and is sometimes differentiated into stem and leaf-like structures.
   - iv. They develop a number of hair-like structures known as rhizoids which help in fixing the plant in the soil for absorbing nutrients.

   b. **Pteridophyta**
   - i. Seedless vascular plants;
   - ii. Feather-like or pinnate fronds;
   - iii. Body differentiated into true stem, leaves and roots like higher plants;
   - iv. They possess well-developed vascular tissues–xylem and phloem for conduction of water and other substances from one part of the plant body to another.

   c. **Gymnospermae**
   - i. Seeds are naked or lie exposed on the surface of megasporophylls;
   - ii. Seeds contain a food laden tissue called endosperm;

iii. Body is differentiated into root, stem and leaves;

iv. Stem is erect, may be branched or unbranched.

d. Angiospermae

i. Flowering plants whose seeds are enclosed in a fruit;

ii. Seeds contain cotyledons called seed leaves;

iii. After fertilization, ovary develops into a fruit;

iv. Xylem contains vessels, phloem contains companion cells.

4. a.

Division Bryophyta	Division Pteridophyta
Have no true roots; distinct stem and leaves present in some cases.	Body differentiated into true stem, leaves and roots like higher plants.
Do not have conducting vascular tissues like xylem and phloem; thus they are called non-vascular cryptogamic plants.	Well-developed vascular tissues for conduction of water and food are present, hence called vascular plants.
They develop a number of hair-like structures known as rhizoids which help in fixing the plant in the soil for absorbing nutrients.	They have roots as structure for fixation in soil.

b.

Gymnospermae	Angiospermae
Plants with naked seeds.	Flowering plants whose seeds are enclosed in a fruit.
Flowers are absent.	Flowers are present.
Companion cells are absent.	Companion cells are present.

5. a. Mosses, liverworts

b. *Marsilea, Selaginella* (club mosses)

c. *Cycas*, Pine

d. *Hibiscus*, Mango

P. 96 Check Your Progress 4

A. Answer these questions.

1. a. Non-chordates: Notochord absent.

Chordates: Notochord present in all stages of life.

b. Pisces: Exclusively water-living animals with a bony or cartilaginous skeleton and their skin is mostly covered with overlapping scales/plates. They have fins for swimming in water.

Amphibia: They are partly adapted to live in water and partly on land and have mucous glands on skin.

c. Aves: Exoskeleton made of feathers; they have flight capacity and their forelimbs are modified into wings.

Mammalia: They have mammary glands and feed their young ones with milk. Body is covered with hair, sweat and oil glands.

d. Porifera: Cells not organized to form tissues and body with many pores (ostia), canals and chambers through which water flows.

Coelenterata: Body has a gut cavity made of coelenteron with a single opening for food and waste material. Mouth is surrounded by a ring of tentacles.

2. The various classes of vertebrates:

i. Class Pisces

ii. Class Amphibia

iii. Class Reptilia

iv. Class Aves

v. Class Mammalia

3. a. Class Pisces:

i. Exclusively water-living animals;

ii. They have bony or cartilaginous skeleton;

iii. Skin is mostly covered with overlapping scales/plates;

iv. They have fins for swimming in water.

b. Class Aves:

i. Exoskeleton made of feathers and scales;

ii. They have flight capacity; their forelimbs are modified into wings for flight;

iii. Jaw with horny beak, no teeth present;

iv. They lay eggs with calcareous shell.

c. **Class Amphibia:**

i. They are partly adapted to live in water and partly on land;

ii. Slimy skin with mucous glands;

iii. Gills in larva, lungs in adults;

iv. Two pairs of pentadactyl limbs.

d. **Class Mammalia:**

i. They have mammary glands and feed their young ones with milk;

ii. Body is covered with hair, sweat and oil glands;

iii. Mostly give birth to young ones;

iv. External ear pinna is present.

4. a. **Class Reptilia:** Snakes, lizards, crocodiles.

b. **Class Mammalia:** Man, tiger, elephant.

c. **Class Aves:** Pigeon, sparrow, crow.

P. 97 EXERCISES

I. Multiple-Choice Questions

A. Choose the most appropriate answer.

1. d	**2.** a	**3.** d	**4.** a
5. c	**6.** a	**7.** b	**8.** d
9. b	**10.** c	**11.** a	**12.** c
13. b	**14.** c	**15.** a	

II. Assertion–Reason Type Questions

A. 1. c **2.** c **3.** a **4.** c

III. Very Short Answer Type Questions

A. Fill in the blanks.

1. Echinodermata
2. R.H. Whittaker (1969)
3. Species
4. genus name; species name
5. Bryophytes
6. Pteridophytes
7. Gymnosperms
8. Arthropoda

B. Match the items in Column A with those in Column B and write down the matching pairs.

1. c **2.** a **3.** b **4.** d **5.** e

C. Note the relationship between the first two words and suggest a suitable word/words for the blanks.

1. Rhizoids` **2.** Naked seeds

3. Triploblastic **4.** Triploblastic

5. Reptilia

D. Arrange and rewrite the terms in each group in the correct order beginning with the underlined term in the group.

1. Kingdom, Phylum, Class, Order, Family, Genus, Species
2. Thallophytes, Bryophytes, Pteridophytes, Gymnosperms, Angiosperms
3. Fish, Amphibians, Reptiles, Birds, Mammals

E. Choose the odd one from the following terms and name the category to which the others belong.

1. Odd one term – *Taenia*, Category – Nematoda
2. Odd one term – Flying fish, Category – Chondrichthyes
3. Odd one term – Catfish, Category – Arthropoda
4. Odd one term – Obelia, Category – Mollusca

F. Given below are some characteristic features of a phylum. Name the phylum.

1. Phylum Porifera
2. Phylum Nematoda
3. Phylum Annelida
4. Phylum Cnidaria
5. Phylum Arthropoda

IV. Short Answer Type Questions

A. Answer these questions.

1. The scientific system of naming organisms is called Binomial nomenclature. Example: *Mangifera indica* is the scientific name of mango, where *Mangifera* is genus name and *indica* is species name. Binomial nomenclature system was proposed by Carl Linnaeus in 1753. According to it any organism shall be given a name. First part is genus name and the second part is species name.
2. The two general classes of Angiosperms are monocotyledons or monocots (seeds with one cotyledon) and dicotyledons or dicots (seeds with two cotyledons). Examples: Monocots: Rice, Wheat. Dicots: Pea, Bean.

3. Animals that breathe by lungs but are without external ear
   i. Class Amphibia – Frog
   ii. Class Reptilia – Lizard
   iii. Class Aves – Sparrow
4. a. Birds (Avis=Bird) have four-chambered heart and are warm-blooded animals.
   b. Amphibians have three-chambered heart and are cold-blooded animals.
5. Bryophyta (Bryon=moss; phyton=plant) are plants belonging to the sub-kingdom Cryptogamae. They are the 'amphibians of the plant kingdom'. They include mosses and liverworts. They are the simplest plants with no true roots. They do not have conducting or vascular tissues such as xylem and phloem. Hence they are called non-vascular cryptogamic plants. The plants develop a number of hair-like structures at their lower end. These are known as rhizoids. Rhizoids help in fixing the plant in the soil and absorbing nutrients. They have chlorophyll and thus they can manufacture their own food by photosynthesis. They generally live in damp and moist places. Examples are mosses, liverworts.
6. Pteridophytes are seedless vascular plants that have sporophytic plant body.
   i. The body is differentiated into true stem, leaves and roots like higher plants.
   ii. They possess well-developed vascular tissues – the xylem and phloem for conduction of water and other substances from one part of plant body to another. Pteridophytes are hence called vascular cryptograms.
   iii. The most conspicuous pteridophytes are the ferns found in humid tropical and temperate areas.

   Examples: *Marsilea*, ferns (*Nephrolepis*), club mosses (*Selaginella*) etc.
7. Kingdom Animalia—
   i. Have muscle cells and nerve cells.
   ii. Power of locomotion.
   iii. Increased sensitivity through nervous system.
   iv. Heterotropic, i.e., depend on others for food.
8. Three features of Arthropoda:
   i. Jointed appendages.
   ii. Body divided into head, thorax and abdomen.
   iii. Hard exoskeleton made of chitin.

   'Arthros' = jointed; 'podos' = leg.
9. In cold-blooded animals, body temperature changes with change in the environmental temperature. Example – Pisces (Fishes). In warm-blooded animals, body temperature does not change with change in environmental temperature. Example – Aves (Birds).
10. Characteristic features of Chordates:
   i. Presence of notochord.
   ii. Presence of dorsal tubular nerve cord.
   iii. Presence of true coelom.
   iv. Triploblastic animals with three germinal layers.

B. Give three examples each of them.

1. Group Pisces – Rohu, hilsa, catla.
2. Class Reptilia – Snake, lizard, crocodile.
3. Class Aves – Pigeon, bulbul, house sparrow.
4. Class Mammalia – Zebra, giraffe, rat.

V. Long Answer Type Questions

A. Answer these questions.

1. (Angeio = a vessel; sperma = seed). The seeds contain cotyledons called seed leaves.
   i. These are flowering plants whose seeds are enclosed within the fruit.
   ii. After fertilization, the ovary develops into a fruit.
   iii. Xylem contains vessels and phloem contains companion cells.

   On the basis of number of cotyledons, angiosperms are divided into two groups monocotyledonous or monocot seeds (seeds with a single cotyledon) and dicotyledonous or dicot seeds (seeds with two cotyledons).

   Examples of monocots are rice and wheat and dicots are Peas and Beans.
2. Kingdom Animalia possesses muscles cells and nerve cells.

   Features of Kingdom Animalia—
   i. Power of locomotion
   ii. Increased sensitivity through nervous system.
   iii. Heterotropic, i.e., depend on others for food.
   iv. They are multicellular eukaryotic organisms.
   v. Cell wall absent.

VI. Structured/Application/Skill Type Questions

A.

Organisms	Feature	Unmatched Feature
Mosquito	Compound eyes, Insecta, gills, spiracles	Gills
Pila	Aquatic, soft-bodied, Annelida, muscular foot	Annelida
Starfish	Marine, diploblastic, five radial arms, calcareous exoskeleton, muscular foot	Calcareous exoskeleton
Rohu	Cartilaginous skeleton, fins, gills, bony fish	Cartilaginous skeleton

B.

Organisms	Phylum/Class/ Order	Odd one out
Hydra, *Obelia*, *Aurelia*, *Ascaris*	Cnidaria	*Ascaris*
Ascaris, *Enterobius*, *Wuchereria*, *Pheretima*	Nematoda	*Pheretima*
Crab, centipede, *Pheretima*	Arthropoda	*Pheretima*
Starfish, Hilsa, sea urchin, sea cucumber	Echinodermata	*Hilsa*