INDIAN SCHOOL AL WADI AL KABIR		
Class: XI	**Department: SCIENCE 2026-2027** **SUBJECT: BIOLOGY**	**Date: 03/11/2026**
Worksheet:13	**UNIT – Diversity in the living world** **CHAPTER: The Living World**	**Note:** **A4 FILE FORMAT**
CLASS & SEC:	**NAME OF THE STUDENT:**	**ROLL NO.**

I. OBJECTIVE TYPE QUESTIONS:

1. The term "Systematics" refers to the:
   A. Identification and study of organ systems in higher plants and animals
   B. Nomenclature and documentation of newly discovered plants and animals
   C. Diversity of kinds of organisms and their evolutionary relationships
   D. Collection of specimens in natural history archives

2. A binomial nomenclature consists of _____ and_____.
   A. Generic name and Phyla
   B. Class and Phyla
   C. Generic name and specific epithet
   D. Phylum and Kingdom
3. The scientific name of lion is _____.
   A. *Panthera Leo*
   B. *Panthera Tigris*
   C. *Panthera Lion*
   D. *Panthera leo*
4. In the taxonomic hierarchy, which of the following pairs of categories shows a higher number of shared common characteristics?
   A. Class and Phylum
   B. Family and Genus
   C. Order and Family
   D. Kingdom and Class

5. The word “Taxa” means a _____.
   A. Unit of Phyla
   B. Genus
   C. Unit of Classification
   D. Unit of Kingdom

For the following questions, two statements are given, one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (i), (ii), (iii) and (iv) as given below:

A. Both A and R are true, and R is the correct explanation of the assertion.
B. Both A and R are true, but R is not the correct explanation of the assertion.

C. A is true, but R is false.
D. A is false, but R is true

6. **Assertion (A):** The scope of systematics was later enlarged to include identification, nomenclature, and classification, taking evolutionary relationships into account.
Reason (R): Systematics is derived from the Latin word *systema*, which means the systematic arrangement of organisms without tracking their ancestry.

7. **Assertion (A):** The number of shared common characteristics is much higher at the Species level than at the Genus level.
Reason (R): As we move up the taxonomic hierarchy from species a kingdom, the number of common characteristics decreases progressively.
8. **Assertion (A):** The plant families Solanaceae and Convolvulaceae belong to the same order, Polymoniales.
Reason (R): Plant families are grouped into higher categories like orders based predominantly on their vegetative characters like leaf shape and root structure.
9. **Assertion (A):** Housefly belongs to the order Diptera and class Insecta.
Reason (R): Housefly belongs to the phylum Chordata due to the presence of jointed appendages.

II. VERY SHORT ANSWER TYPE QUESTIONS (2M):

9. Define the terms "Systematics" and "Taxonomy". How do they differ from each other?
10. What are the different defining properties of a living organism?
11. Define a taxon. Give some examples of taxa at different hierarchical levels.
12. What do you understand by the term species? Discuss its meaning in higher plants, animals, and bacteria.

III. SHORT ANSWER TYPE QUESTIONS (3M):

13. Differentiate between taxonomy and systematics.
14. What are the key reasons why classification systems change?
15. *Brassica campestris* Linn
(i) Give the common name of the plant. Why are they written in italics?
(ii) What do the first two parts of the name denote?
(iii) What is the meaning of Linn written at the end of the name?

IV. CASE STUDY BASED QUESTIONS (4M):

16. During an international biodiversity survey, researchers documented four distinct organisms from a single ecological reserve: a human, a housefly, a mango tree, and a wheat plant. To maintain scientific uniformity across global research papers, the team avoids local names and applies the rules of binomial nomenclature. When organizing these organisms into a taxonomic hierarchy, the researchers observe that categories are not static slots but represent varying degrees of shared evolutionary traits. As they ascend from the baseline species level up to the kingdom level, the direct commonalities between these highly diverse organisms begin to fade, while the complexity of tracing their phylogenetic lineages increases.

A. Based on the universal rules of binomial nomenclature, how should the scientific names of the human and the mango tree be formatted when printed in a research paper versus when written by hand?
B. The housefly and the human belong to the same Kingdom (Animalia). Identify the specific Class and Phylum/Division for both organisms to show where their taxonomic paths split.
C. Explain the scientific reason why the mango tree and the wheat plant are placed in two

different biological Classes, and state the exact Order for each.

D. Why does the number of shared common characteristics decrease as the researchers move from the Genus level up to the Kingdom level for these organisms?

V. LONG ANSWER TYPE QUESTIONS (5M)

17. Define and understand the following terms:
    (i) Phylum (ii) Class (iii) Family (iv) Order (v) Genus
18. **A. W**hat is a taxonomic hierarchy?
    B. Differentiate between a Genus and a Family by giving suitable biological examples
    C. State the complete taxonomic classification (Family, Order, Class, and Phylum/Division) for both Housefly and Wheat.

S.NO	ANSWERS
1.	C. Diversity of kinds of organisms and their evolutionary relationships
2.	C. Generic name and specific epithet
3.	D. *Panthera leo*
4.	B. Family and Genus
5.	C. Unit of Classification
6.	C. A is true, but R is false
7.	A. Both A and R are true, and R is the correct explanation of the assertion.
8.	C. A is true, but R is false
9.	C. A is true, but R is false
II	**VERY SHORT ANSWER TYPE QUESTIONS(2M)**
9.	**Taxonomy:** The process of identification, nomenclature, and classification of organisms based on their characteristics. **Systematics:** A broader field of study that includes taxonomy but also takes into account the **evolutionary (phylogenetic) relationships** between organisms.
10.	i)Consciousness ii)A living organism can grow. iii)All living organisms can reproduce. iv)All living organisms show metabolism.
11.	A **taxon** (plural: taxa) is a unit of classification in the biological system, representing a group of organisms at any hierarchical level. Examples of taxa at different hierarchical levels: • **Kingdom:** The taxon for all animals is *Animalia*. • **Phylum:** The taxon for all animals with a backbone is *Chordata*. • **Genus:** The taxon for the genus of lions, tigers, and leopards is *Panthera*. • **Species:** The taxon for modern humans is *Homo sapiens.*
12.	Species refers to a group of organisms with similar characteristics. In higher plants and animals, reproductive isolation helps define species, while in bacteria, genetic information is used to classify species due to the inability to use reproduction as a criterion.
III	**SHORT ANSWER TYPE QUESTIONS (3M)**

13.

Feature	Taxonomy	Systematics
Scope	The branch of science that deals with the identification, nomenclature, and classification of organisms.	A broader field that includes taxonomy and also studies the evolutionary relationships (phylogeny) among organisms.
Focus	Primarily focused on the principles and rules of classification.	Concerned with the diversity of organisms and all their comparative and evolutionary relationships.
Basis	Based on the characterization, identification, classification, and naming of organisms.	Takes into account a broader range of evidence, such as morphology, ecology, biochemistry, and genetics, to establish evolutionary links.

14. **Expanding knowledge:** Scientific knowledge and understanding of organisms, their internal and external structures, and their relationships are constantly evolving.
Advancements in technology: New techniques in molecular biology, biochemistry, and genetics provide deeper insights into the relationships between different organisms, leading to revisions in classification.
Understanding of relationships: Early classification systems were based mainly on morphological features. Modern classification, known as biosystematics, focuses on evolutionary and genetic relationships.
New discoveries: New species of organisms are still being discovered, and their features necessitate adjustments to the existing classification systems to accommodate them.

15. i) Mustard: Biological names are generally in Latin and written in italics.
ii) The first part denoting the genus starts with a capital letter while the second part is the specific epithet starts with a small letter.
iii) Mangifera indica Linn. It indicates that this species was first described by Linnaeus.

IV **CASE STUDY BASED QUESTIONS (4M)**

16. A. **When Printed:** They must be in *italics* to indicate their Latin origin, with the genus capitalized and the species in lowercase (e.g., *Homo sapiens* and *Mangifera indica*).
When Handwritten: The generic name and the specific epithet must be **underlined separately** (e.g., Homo sapiens and Mangifera indica). A single continuous underline is incorrect.

B. Housefly: Class Insecta | Phylum Arthropoda
Human: Class Mammalia | Phylum Chordata

C. They split based on seed structure; the mango tree is a dicotyledon (two cotyledons in the seed), while the wheat plant is a monocotyledon (one cotyledon).
- Mango Order: Sapindales (Class: Dicotyledonae)
- Wheat Order: Poales (Class: Monocotyledonae)

D.
- Genus is a lower, highly specific category that groups closely related species sharing many fundamental structural and evolutionary traits.
- As you ascend to Kingdom, the categories become broader to accommodate a massive, diverse array of organisms based on fewer, highly generalized macro-level features (like cellular organization or mode of nutrition), causing specific shared traits to decrease.

V	LONG ANSWER TYPE QUESTIONS (5M)
17.	(i) **Phylum:** A taxonomic rank below Kingdom and above Class. It includes organisms sharing common characteristics. (ii) **Class:** A group of orders with similar characteristics, classified below Phylum and above Order. (iii) **Family:** A category below Order and above Genus, grouping closely related genera. (iv) **Order:** A group of families with some shared characteristics. (v) **Genus:** A group of related species with more similarities than those within different genera.
18.	**A.Taxonomic Hierarchy and Arrangement** • **Definition:** A taxonomic hierarchy is the stepwise framework or arrangement of all taxonomic categories in a descending or ascending order, where each category represents a rank or a specific level of classification. • **Ascending Order Arrangement:** The categories arranged from lowest (most specific) to highest (broadest) are:

name Prepared by Ms.

B.

Feature / Criteria	Genus	Family
Definition	A group of closely related species that share more common characteristics with each other than with species of other genera.	A higher taxonomic category that aggregates one or more related genera.
Number of Shared Traits	Organisms share a higher number of common, fundamental characteristics.	Organisms share fewer common traits compared to the genus level.
Plant Example	*Solanum* is a genus that includes potato (*Solanum tuberosum*) and brinjal (*Solanum melongena*).	The family Solanaceae groups multiple related genera together, such as *Solanum*, *Petunia*, and *Datura*.

C.

1. Housefly (*Musca domestica*)

- **Family:** Muscidae
- **Order:** Diptera
- **Class:** Insecta
- **Phylum:** Arthropoda

2. Wheat (*Triticum aestivum*)

- **Family:** Poaceae
- **Order:** Poales
- **Class:** Monocotyledonae
- **Division:** Angiospermae

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