2024
UPDATED
SYLLABUS

BIOLOGY
NCERT - 11

- Useful for CBSE, NEET exams
- Each topic contains Detailed Theory with images
- Every topic contains Exercises and Detailed solutions

1.LIVING WORLD

Biology Smart Booklet

Theory + NCERT MCQs + NEET PYQs

THE LIVING WORLD

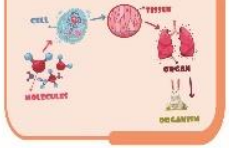
LIVING BEING CHARACTERISTICS

GROWTH
- Twin characteristics
  1. Mass
  2. Number
- Not a defining feature

CONSCIOUSNESS
- Responding to stimuli
- Sensing the environment
- Humans are – self conscious
- Defining character.

REPRODUCTION
- By two ways — Sexual, Asexual
- All living being reproduce for continuity of species

CELLULAR ORGANISATION
- All organisms are composed of cells
- Defining character
- Body organization starts with sub-microscopic molecular level.



METABOLISM
- All organism (uni & multicellular) experience metabolic reaction at any given time
- Involves catabolism & anabolism
- Cellular metabolism is defining feature

TAXONOMICAL AID

HERBARIUM
- Exclusively for plants
- Dried plant specimens are presumed on sheets, with certain information like date & place of collection are name of the collector.

BOTANICAL GARDEN
- Place for living plants labelled with biological name
- Indian Botanical Garden, Howrah famous for Great Banyan tree.

ZOOLOGICAL PARK
- Commonly called Zoos
- To protect wild animals in their protected environment

KEY
- On the basic of similarities & dissimilarites used for identification
- Each statement- lead
- Pair of contrasting characters- Couplet

MISCELLANEOUS
- Flora: Accounts the distribution of plants in a region
- Manuals : Gives information for identification of species in a region
- Monographs : It has collective data on single taxon
- Catalogues : Has brief information about species found in region

MUSEUM
- Plants and animals specimens are stored
- Established in educations institutions

SYSTEMATIC
- Branch of science dealing with organism's diversity & their relationship.
- Scope:
  - CHARACTERIZATION
  - IDENTIFICATION
  - CLASSIFICATION
  - NOMENCLATURE

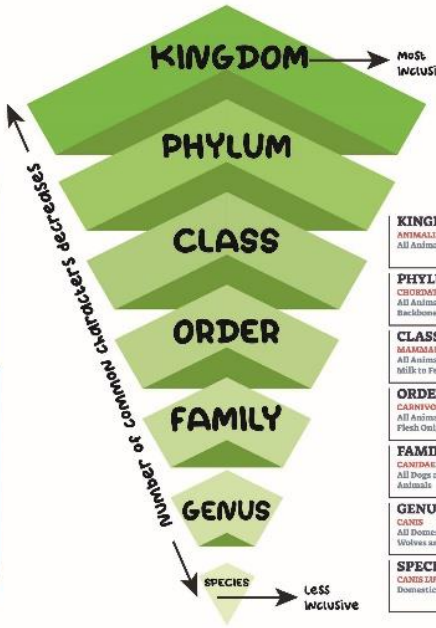
CLASSIFICATION
- Done by analysing the similarities & dissimilarities among organism.

DIVERSITY IN LIVING WORLD

BINOMIAL NOMENCLATURE
- Plants named by ICBN
- Animals named by ICZN
- By Carolus Linnaeus
- Binomial Name/ Scientific Name (has two parts)
  - Generic Name: Starts with capital letters
  - Specific epithet: Starts with small letters
- When typed – in italics
- When handwritten – underlined
- Author's name may be added at the end of biological name

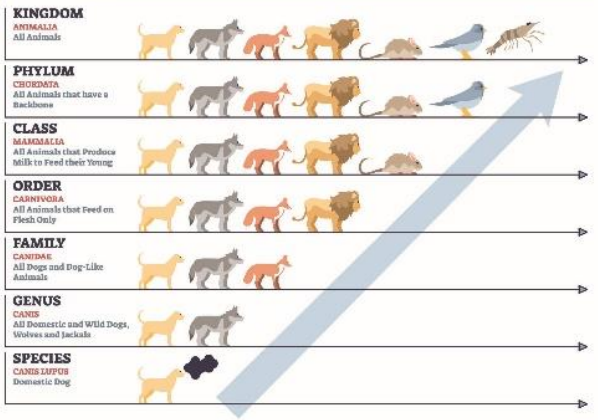
BOOKS
- Systems Naturae - Linnaeus
- Genera Plantarum - Linnaeus

TAXONOMICAL CATEGORIES



- Taxon which is : Unit of biological classification: Sometimes confused with categories.

Eg:- Division – Category
Bryophyta - taxon



THE LIVING WORLD

What is Growth

To differentiate whether an organism is living or not, various characteristics need to be checked in the case of living organisms.

Growth: All living organisms can undergo the process of growth and development that results in an increase in the mass and number of cells. Multicellular organisms grow by cell division. The growth of plants and animals takes place with the help of cell division. In the case of plants, the cell division occurs throughout their life while in the case of animals the cell division occurs up to a certain age, and then the cells lose their capability to divide.

It results in an increase in body mass and increases in the number of cells.

Examples: Mountains, boulders, sand mounds, etc grow by the accumulation of the materials although they are non-living. So, growth cannot be taken as the factor which categorizes the organism as living.

Metabolism: As the body and organs are the constituents of different chemicals, they perform various metabolic functions that result in the conversion of chemicals into other biomolecules. All plants, animals, and microbes exhibit metabolism. It is absent in the case of non-living organisms but may be introduced through the in-vitro method.

Sensitivity: The living organisms whether prokaryotes or eukaryotes respond according to their surroundings and the stimuli present around them, it may be physical, chemical, or biological. The living organisms are sensitive about their surroundings and are responsible in accordance with their stimuli. The stimuli can either be biological, physical, or chemical.

Cellular Organization: It is the defining characteristic of living organisms since all living organisms are made up of cells that help in performing various cellular functions resulting in the growth and development, reproduction, metabolism, etc in the body. Since non-living organisms are not made up of cells so they do not have cellular organization.

Movement: The lining organisms show movement and locomotion and more specifically plants move according to the movement of the sun.

Example: The flame of a candle and a crystal do not show movement while if we take mango trees then we can see they undergo movement, growth, and development along with reproduction and results in the production of more trees through their seeds. Thus mango trees are said to be alive as they show movement while candles flame and crystal are not alive.
Also, the organisms that are aware and are conscious of their surroundings will be living organisms.

Characteristics of Life

Living organisms exhibit undisputable signs of life – such as growth, reproduction and metabolism. Higher organisms such as humans showcase consciousness – where we become aware of our surroundings. Similarly, consciousness may be

observable in many lower forms of life such as bacteria and protozoa. When these organisms engulf food or react to their environment, it is done primarily to ensure survival.

Diversity in the Living World

In response to the sheer number of organisms discovered to date, a system of standardizing names was implemented. Binomial nomenclature assigns a two-part scientific name to an organism. Botanists and zoologists follow set principles and criteria when assigning a scientific name to an organism. For instance – plant names are assigned based on the principles and criteria set by the International Code for Botanical Nomenclature (ICBN). Similarly, animal names are assigned on the basis of the International Code of Zoological Nomenclature (ICZN).

Classification of organisms according to the aforementioned conventions involved a hierarchy of steps, with each step representing a category or a rank. The most basic unit of classification is species. A species is a group of individual organisms with fundamental similarities.

Reproduction

Reproduction, a characteristic of living organisms is the process of producing off springs, possessing features similar to those of parents. In multicellular organisms, the mode of reproduction is generally sexual. Living organisms also reproduce by asexual means.

Some examples are given below.

- Fungi spread and multiply fast by producing millions of asexual spores. Some fungi, the filamentous algae and the protonema of mosses multiply by fragmentation.
- In yeast and Hydra, budding occurs to produce new organisms. While, in Planaria (flatworm),
- regeneration of fragmented body parts occur. These parts in turn grow as a new organism.
- Unicellular organisms like bacteria, algae and Amoeba reproduce by increasing the number of cells, i.e., through cell division (growth is synonymous with reproduction).
- Some organisms like mules, sterile worker bees, infertile human couples, etc., do not reproduce. Hence, reproduction also cannot be an all-inclusive defining characteristic of living organisms.

Metabolism

Metabolism is an another characteristic and defining feature of all living things. The sum total of anabolic or constructive reactions (anabolism) and catabolic or destructive reactions (catabolism) continuously occurring inside the body is called metabolism.

Metabolism: Anabolism + Catabolism Metabolism occurs in all unicellular and multicellular organisms. Its two stages include, i.e., anabolism, the process of building up or synthesis of complex substances from simpler ones, e.g., Photo

synthesis and catabolism, the process of breakdown of complex substances into simpler substances, e.g., Respiration, releasing waste outside.

Metabolic reactions can also be demonstrated outside the body in cell free systems, which are neither living nor non-living. Thus, these reactions in vitro are surely living reactions not living things. Hence, metabolism can be considered as a defining feature of all living organisms without exception.

The important differences between anabolism and catabolism are:

Catabolism	Anabolism
Catabolism breaks down big complex molecules into smaller, easier to absorb molecules.	Anabolism builds molecules required for the body's functionality.
The process of catabolism releases energy.	Anabolic processes require energy.
Hormones involved in the processes are adrenaline, cytokine, glucagon, and cortisol.	Hormones involved in the process are estrogen, testosterone, growth hormones and insulin.
Examples of catabolic processes are proteins becoming amino acids, glycogen breaking down into glucose and triglycerides breaking up into fatty acids.	Examples include the formation of polypeptides from amino acids, glucose forming glycogen and fatty acids forming triglycerides.
In catabolism, potential energy is changed into kinetic energy.	In anabolism, kinetic energy is converted into potential energy.
It is required to perform different activities in living entities.	It is required for maintenance, growth, and storage.

Cellular Organization

The cells are the building blocks of all living things whether plants, animals or humans. The unicellular organisms are made of a single cell, while multi cellular organisms are formed by millions of cells. The cells contain protoplasm (living matter) and cell organelles (inside the cells) which perform several activities at the cellular level and result into various life processes.

Consciousness

All living organisms have excellent ability to sense their environment. They respond to various physical, chemical and biological stimuli.

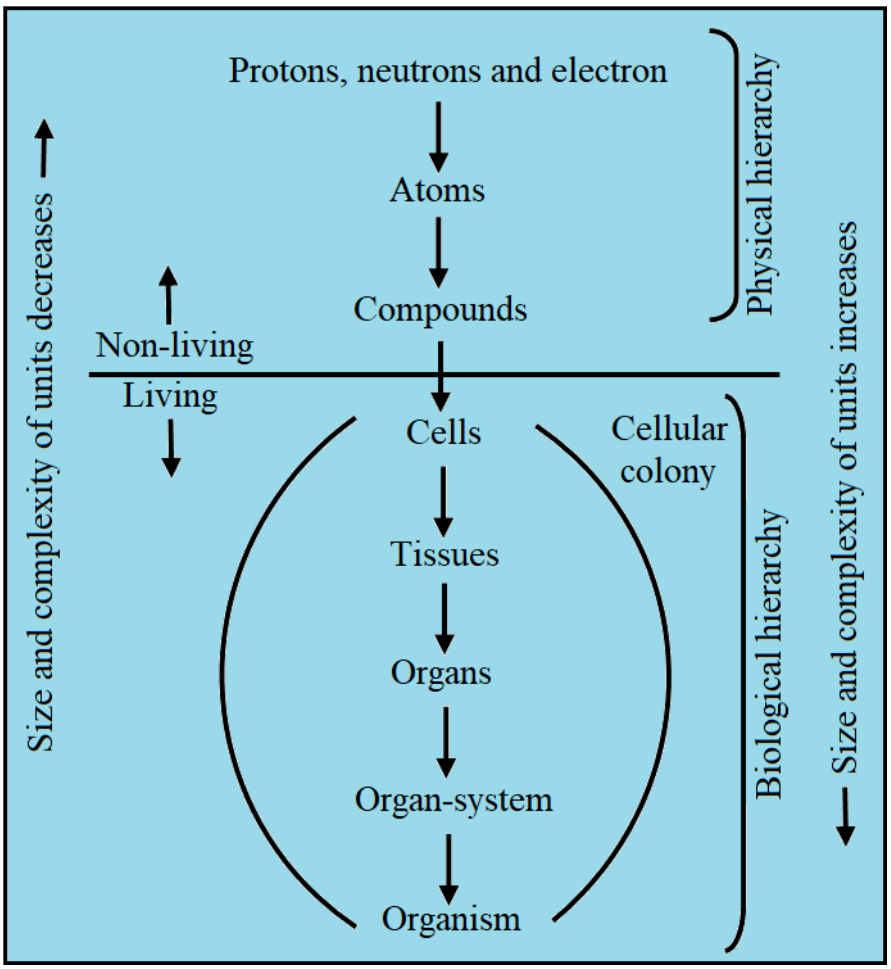
The various external factors to which living organisms respond are light, water, temperature, pollutants, other organisms, etc. Light duration or photo period affects many seasonal breeders, plants as well as animals. All living things respond to chemicals, entering their * bodies.

Humans are superior to all living things as they have an additional ability of self-consciousness. Therefore, consciousness can also said to be a defining property of living organisms.

However, in human beings, it is more difficult to define living state, e.g., Patients lying in coma supported by machines that replace heart and lungs, are brain-dead with no self-consciousness.

Body Organization

The body of living organisms is organized, i.e., several component and sub-components cooperate with each other for the functioning of whole body.



Physical and Biological Hierarchies

There is a physical (non-living) hierarchy and biological hierarchy in the organization of living body. In physical hierarchy, various non-living components aggregate to form compounds, which finally enter the living world in the form of cells. These cells organize to form tissues, that form organs and several organs combustive to form organ-systems. Finally, many organ systems organize and form a living organism.

The properties of tissues are not present in the constituent cells but arise as a result of interactions among the constituent cells. For example, bone is a hard tissue, which provides framework to the body. But the cells present inside it do not have this property. This phenomenon of interactions between various components of the body results in the hierarchy of organization.

The various life processes are the result of this interaction and coordination. The complexity in organization enables living organisms as to be self-replicating, evolving, self-regulating and responding to external stimuli. All living organisms along with their ancestors and descendants are linked to one another by sharing of common genetic material in the form of DNA in varying degrees. This DNA is responsible for the expression of specific traits in organisms. Thus, Biology is the story of life on earth. It is the story of evolution of living organisms on the earth.

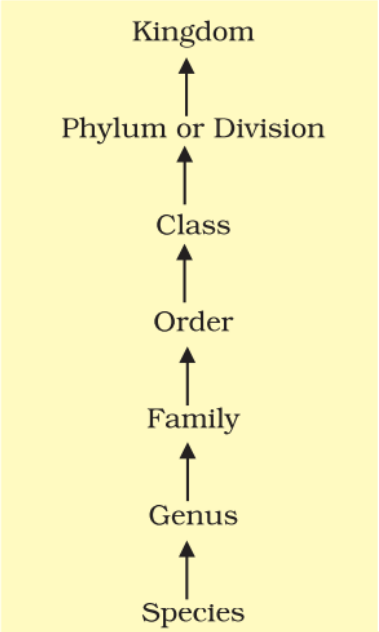
Taxonomic Categories

In 1956 the term Taxon was introduced and in 1964, Mayr defined taxon to be the various categories based on different characters of the organisms that consist of a taxonomic group of any rank.

Taxonomic Hierarchy

Various organisms in different categories depending upon their common characters to make classification easier. These groups together are called taxonomic hierarchies. The taxonomic hierarchy includes. Kingdom, division of the kingdom, phylum, class, order, family, genus, and species. Species are the lowest while the kingdom is the highest rank within the hierarchy. It is also called the Linnaean hierarchy as it was first proposed by Carolus Linnaeus, the Father of Systematic Botany. The hierarchy includes seven obligate categories.

They are as follows:



Taxonomic categories showing hierarchial arrangement in ascending order

Species: It is the lowest category of the taxonomic hierarchy. There are around 8.7 million species observed on earth till now while their rest are left undiscovered. It refers to a group of organisms that are similar in shape, form, generative options. Species may be more divided into subspecies. It was first defined by Ernst Mayr in 1964 that the species are the interbreeding populations that are reproductively

isolated from other such groups. The term species was first introduced by the biologist John Ray. E.g., sapiens.

Genus: A category that is placed above species as they consist of a group of related species. Genus are of various types based on the number of species present like monotypic (one genus present), and polytypic (several species present). For e.g., the genus Panthera constitutes both lion and tiger.

Family: This taxonomic category consists of related genera having similar characteristics. For e.g., the families Canidae, Felidae, Ursidae, etc. come under one order Carnivora.

Order or Cohort: This taxonomic category is more specific than the class as it consists of one or more similar families. The class Mammalia consists of around twenty-six orders that include primates, Carnivora, etc.

Class: It was the most general taxonomic category before the introduction of phyla. In the animal kingdom, there are around 108 classes that include Pisces, reptilia, aves, etc. The categories used in classification now are different from those of the Linnaeus taxonomy.

Phylum: This category is more specific than the kingdom. In the animal kingdom, there are around thirty-five phyla that include phylum Arthropoda, Chordata, etc.

Kingdom: The highest level of classification is the kingdom which is further divided into various subgroups. The total kingdoms of the living organisms are five in number that includes Monera, Protista, Fungi, Plantae, and Animalia.

Generic Name	Specific Epithet	Common Name
Mangifera	indica	Mango
Solanum	tuberosum	Potato
Solanum	nigrum	Nightshade
Panthera	leo	Lion
Panthera	tigris	Tiger
Homo	Sapiens	Man

Common Name	Biological Name	Genus	Family	Order	Class	Phylum/Division
Man	Homo sapiens	Homo	Hominidae	Primata	Mammalia	Chordata
Housefly	Musca domestica	Musca	Muscidae	Diptera	Insecta	Arthropoda
Mango	Mangifera indica	Mangifera	Anarcardiaceae	Sapindales	Dicotyledonae	Angiospermae

Wheat	Triticum aestivum	Triticum	Poaceae	Poales	Monocotyledonae	Angiospermae

Herbarium

A herbarium is a collection of preserved plant specimens that are dried and labelled. The plant species that are collected are first dried, pressed, mounted, and then labelled on the herbarium sheets.

The steps involved in the herbarium technique are as follows:

- Collecting various specimens from different areas.
- Drying the particular specimen by placing them in between the various folds of newspapers or by iron drying them.
- By dipping the specimens in mercuric chloride poisoning is done.
- With the help of a cello tape or glue, mounting the dried specimens on the herbarium sheets.
- Certain specimen parts that are difficult to attach to the sheet, like stems, are stitched so that they stick to their position on the sheet.
- To keep them for a longer time, preserves must be sprayed.
- The labeling for identification of all the specimens must be done at the left side of the bottom corner. The name, date of collection, area of collection, habit, etc must be written.
- Lastly, these herbarium sheets are deposed under the herbarium covers where the rest of the herbarium sheets are covered and packed.
- These herbarium sheets are stored in the cupboards named under their category.

To avoid any confusion each herbarium sheet is to be labeled properly on the right-hand corner at the bottom of the herbarium sheet which includes the scientific name along with author's name, local name, name of family, locality, date of collection, name of the collector, etc.

The book flora consists of information about the collected specimens, this book gives the information regarding the number of plant species present in the various regions along with their brief description. is published in the form of a book called flora.

Some important floras of India are Flora of British India, Flora of Delhi, Flora of Madras, Flora of Travancore, etc.

In England, the Royal Botanical Garden at Kew is the largest Herbarium in the world. Central National Herbarium is the largest Herbarium in India located in the Indian Botanical Garden at Kolkata established in 1787.

NCERT LINE BY LINE QUESTIONS

What is living?

1. The characteristics of growth include
   A) increase in mass B) increase in number
   C) increase in length D) both A. and B.
2. Unicellular organisms grow by
   A) cell elongation B) cell division
   C) accumulation of material on the surface D) none of these
3. Mountains, boulders and sand mounds also grow, but they are not considered as living organisms because they grow by
   A) Accumulation of material on their inner surface
   B) the division of their particles.
   C) accumulation of material on their outer surface.
   D) both A. and B.
4. Choose the correct statement about growth in plants.
   A) Growth occurs continuously throughout their lifespan by cell division.
   B) The growth is seen only upto a certain age.
   C) Growth occurs by the accumulation of material on the upper surface of their cells.
   D) Growth occurs only in certain cells.
5. In yeast and Hydra, reproduction occurs by
   A) conjugation B) sporulation
   C) budding D) none of these
6. The organism(s) that can multiply by fragmentation is/are
   A) fungi B) filamentous algae
   C) protonema of moss D) all of these
7. In Amoeba, reproduction is synonymous with
   A) digestion B) growth
   C) locomotion D) none of these
8. Living organisms that do not reproduce are
   A) mule B) worker bees
   C) infertile human couples D) all of these
9. Match Column-I with Column-II and choose the correct option from the codes given below.

Column-I (Organism)	Column-II (Method of reproduction)
a Planaria	(1) Fragmentation
b Hydra	(2) Regeneration
c Fungi	(3) Binary fission
d Amoeba	(4) Budding

Codes

a b c d	a b c d
A) 2 4 1 3	B) 4 2 3 1
C) 3 1 4 2	D) 1 3 2 4

10. The sum total of all the chemical reactions occurring in our body is
    A) anabolism B) catabolism C) metabolism D) none of these
11. An isolated metabolic reaction outside the body of an organism, performed in a test tube is
    A) living B) non-living
    C) neither living nor non-living
    D) sometimes living and sometimes nonliving depending upon environmental factors
12. Choose the incorrect statement from the following:
    A) All living organisms exhibit metabolism.

B) Metabolism is the sum total of all chemical reactions occurring in our body.
C) Metabolism is a defining feature of all living organisms.
D) Metabolic reactions cannot be demonstrated outside the body in cellfree systems.

13. Isolated metabolic reactions occurring invitro are not living things, but surely living reactions. It proves that 'A' of the body is the defining feature of life forms. Here 'A' is
A) reproduction B) cellular organization
C) metabolic reactions D) growth

14. Identify the defining characteristics of living organisms from the following.
A) Growth B) Ability to make sound
C) Reproduction D) Response to external stimuli

15. Photoperiod affects
A) reproduction B) metabolism
C) growth D) cellular organization

16. Living organisms respond to environmental stimuli which could be
A) physical B) chemical C) biological D) all of these

17. Match Column-I with Column-II and choose the correct option from the codes given below:

Column-I	Column-II
a Growth	(1) Production of progeny
b Reproduction	(2) Sum of all chemical reactions occurring in body
c Metabolism	(3) Sense and respond to environmental stimuli
d Consciousness	(4) Increase in mass and number

Codes

a b c d	a b c d
A) 3 2 4 1	B) 4 1 2 3
C) 1 3 2 4	D) 2 4 3 1

18. All living organisms are linked to each other because
A) they show a common cellular organization.
B) they possess common genetic material of the same type.
C) they share common genetic material but to varying degrees.
D) all of these.

19. Assertion: Non-living objects also grow.
Reason: They grow by accumulation of material on the surface.
A) Both assertion and reason are true and reason is the correct explanation of assertion.
B) Both assertion and reason are true but reason is not the correct explanation of assertion.
C) Assertion is true but reason is false.
D) Both assertion and reason are false.

20. Assertion: Reproduction is not a defining property of living organisms.
Reason: Mules do not reproduce.
A) Both assertion and reason are true and reason is the correct explanation of assertion.
B) Both assertion and reason are true but reason is not the correct explanation of assertion.
C) Assertion is true but reason is false.
D) Both assertion and reason are false.

21. Assertion: Non-living objects also exhibit metabolism.
Reason: Isolated metabolic reactions occurring, invitro are living things.
A) Both assertion and reason are true and reason is the correct explanation of assertion.
B) Both assertion and reason are true but reason is not the correct explanation of assertion.
C) Assertion is true but reason is false.
D) Both assertion and reason are false.

Diversity in the living World

22. The process of naming of living organisms is called
A) systematics B) taxonomy C) nomenclature D) none of these

23. Identification of an organism means

A) its correct description B) its correct classification
C) its correct nomenclature D) all of these

24. ICBN stands for
A) International Code for Biological Naming
B) International Centre for Botanical Nomenclature
C) Indian Code for Biological Nomenclature
D) International Code for Botanical Nomenclature

25. Choose the correct statement about scientific names.
A) They ensure that each organism has only one name.
B) Description of any organism should enable the people to arrive at the same name.
C) They ensure that such a name has not been used for any other organism.
D) All of these.

26. The system of providing a name with two components is calle
A) trinomial nomenclature B) binomial nomenclature
C) uninominal nomenclature D) none of these

27. The naming system, which is practised by biologists all over the world, was given by

A) Carolus Linnaeus B) Whittaker
C) Haeckel D) Woese

28. Match the Column-I with Column-II and choose the correct option from the codes given below.

Column-I	Column-II
a Biodiversity	(1) Correct description of an organism
b Nomenclature	(2) The variety of living organisms
c Identification	(3) A system of providing a name with two components
d Binomial nomenclature	(4) Naming of living organisms

Codes -

a b c d	a b c d
A) 2 4 1 3	B) 4 3 2 1
C) 1 2 4 3	D) 3 1 4 2

29. Select correctly written scientific name of mango which was first described by Carolus Linnaeus.

A) Mangifera indica Car Linn. B) Mangifera indica Linn.
C) Mangifera indica D) Mangifera Indica

30. In *Mangifera indica* Linn., the specific epithet is
A) Mangifera B) indica C) Linn. D) Both A. and B.

31. Choose the incorrect statement about rules of nomenclature.
A) Biological names are generally given in Latin.
B) The first word in biological name represents the genus while the second component denotes the specific epithet.
C) When hand written, both words of biological names are separately underlined.
D) Both the words of biological name start with capital letter.

32. Which of the following is against the rules of ICBN?
A) Handwritten scientific names should be underlined.
B) Every species should have a generic name and a specific epithet.
C) Scientific names are in latin and should be italized.
D) Generic and specific names should be written starting with small letters.

33. Biological names are generally written in
A) Greek language B) Latin language
C) English language D) Hindi language

34. The process by which organisms are grouped into convenient categories based on some easily observable characters, is called
A) taxonomy B) identification
C) classification D) nomenclature

35. The scientific term used for the categories of organisms to study them is
A) taxa B) biological name C) systematics D) none of these
36. The process of classification is called
A) systematics B) taxonomy C) nomenclature D) identification
37. The modern taxonomic studies are based on
A) cell structures B) external and internal structure
C) development process D) all of these
38. Among the following process which one is not the basic to taxonomy?
A) Identification B) Classification
C) Collection of specimen D) Nomenclature
39. Systematics refers to
A) diversities of different kinds of organisms and their relationship.
B) identification and study of organ systems of organisms.
C) identification and preservation of organisms.
D) study of habitat of organisms and their classification.
40. Match Column-I with Column-II and choose the correct option from the codes given below.

Column-I	Column-II
a Mammalia	(1) Specific epithet
b *Mangifera*	(2) Branch of study
c *indica*	(3) Taxa
d Systematics	(4) Generic name

Codes -

a b c d	a b c d
A) 3 4 1 2	B) 2 1 3 4
C) 1 2 4 3	D) 4 3 2 1

41. Assertion: Binomial nomenclature given by Linnaeus is being practiced by biologists all over the world.
Reason: Each name of this system has two components, the generic name and the specific epithet.

A) Both Assertion and Reason are true and Reason is correct explanation of Assertion.
B) Both Assertion and Reason are true, but Reason is not the correct explanation of Assertion.
C) Assertion is true, but Reason is false. D) Assertion is false, but Reason is true.
42. Assertion: The process of classification of organisms is taxonomy.
Reason: It is merely based on the external features of organisms.
A) Both Assertion and Reason are true and Reason is correct explanation of Assertion.
B) Both Assertion and Reason are true, but Reason is not the correct explanation of Assertion.
C) Assertion is true, but Reason is false. D) Assertion is false, but Reason is true.
43. Assertion: Systematics is the study of organisms, their diversities but not the relationships among them.

Reason: Systematics is derived from a English word 'systema'.
A) Both Assertion and Reason are true and Reason is correct explanation of Assertion.
B) Both Assertion and Reason are true, but Reason is not the correct explanation of Assertion.
C) Assertion is true, but Reason is false. D) Assertion is false, but Reason is true.

Taxonomic Categories

44. All the taxonomic categories together constitute the
A) taxon B) family C) kingdom D) hierarchy
45. The lowest taxonomic category is
A) agenus B) species C) class D) family
46. The basic requirement for placing an organism in various categories is the knowledge of

A) characters of an individual B) characters of group of organisms
C) binomial nomenclature D) both A and B
47. *Solanum* includes species
A) nigrum B) melongena C) tuberosum D) all of these

48. The taxonomic category, genus represents
A) an individual organism B) a collection of organisms
C) a group of closely related species of organisms
D) none of these

49. Match Column-I and Column-II and choose the correct option from the codes given below.

Column-I (Organism name)	Column-II (Scientific name)
a Lion	(1) *Panthera tigris*
b Leopard	(2) *Panthera leo*
c Tiger	(3) *Solanum nigrum*
d Potato	(4) *Panthera pardus*

Codes -

a b c d		a b c d	
A) 2 4 1 3		B) 4 2 1 3	
C) 1 2 4 3		D) 3 4 2 1	

50. 'Suffix' used for a unit of classification in plants to indicate 'family' taxonomic category is

A) -ales B) –onae C) -aceae D) ae

51. The taxonomic category 'order' lies between
A) Genus and species B) Genus and family
C) Family and class D) Class and phylum

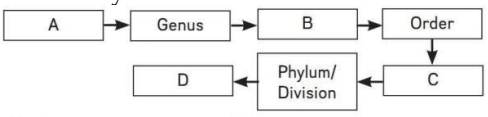
52. Choose the incorrect statement from the following
A) Each genus may have one or more than one specific epithets representing different organisms.
B) Potato and brinjal are two different species but both belong to the genus Solanum.
C) 'Families' are characterized on the basis of merely reproductive features of plant species.
D) 'Order' is a higher taxonomic category and is identified on the basis of aggregates of characteristics.

53. Fishes, amphibians, reptiles and birds represent which taxonomic category?
A) Class B) Phylum C) Order D) Kingdom

54. The 'phylum' taxon of animal classification is equivalent to which taxon of plant classification?

A) Class B) Division C) Order D) Family

55. Refer to the given figure showing hierarchical arrangement of taxonomic categories in the ascending order. In the figure some taxa are labeled as A, B, C and D. Which taxon will show maximum similar characters among its members? Identify it.



(a) B (b) A
(c) C (d) D

A) B B) A C) C D) D

56. The kingdom that comprises all plants from various divisions is
A) Plantae B) Animalia C) Chordata D) Mammal

57. Match the Column-I with Column-II and choose the correct option from the codes given below:

Column-I	Column-II
a Order	(1) *Solanum*
b Kingdom	(2) Solanaceae
c Family	(3) Plantae
d Genus	(4) *tuberosum*
e Species	(5) Polymoniales

Codes

a b c d e		a b c d e	
A) 5 3 2 1 4		B) 4 2 5 3 1	
C) 1 5 3 4 2		D) 3 4 1 5 2	

58. In a taxonomic hierarchy, on moving from species to kingdom, the number of common characteristics

A) will increase B) remain same C) will decrease D) may increase or decrease

59. Choose the correct statements from the following:
I. In case of plants, classes with a few similar characters are aligned to a higher category called phylum.
II. Sub-categories have also been developed in the taxonomic hierarchy to facilitate more sound and scientific placement of various taxa.
III. Class includes related orders.
IV. Convolvulaceae family is included in polymoniales order on the basis of its floral characters.
Select the correct option.
A) I and IV B) II and III C) II, III and IV D) All of these

60. Match Column-I with Column-II for housefly classification and select the correct option using the codes given below.

Column-I	Column-II
a Family	(1) Diptera
b Order	(2) Arthropoda
c Class	(3) Muscidae
d Phylum	(4) Insecta

Codes

a b c d	a b c d
A) 4 3 2 1	B) 4 2 1 3
C) 3 1 4 2	D) 3 2 4 1

61. Assertion: Genus may have one or more than one species epithets.
Reason: Genus comprises a group of related species.
A) Both Assertion and Reason are true and Reason is correct explanation of Assertion.
B) Both Assertion and Reason are true, but Reason is not the correct explanation of Assertion.
C) Assertion is true, but Reason is false.
D) Assertion is false, but Reason is true.

62. Assertion: Order is the assemblage of families which exhibit a few similar characters.
Reason: Plant family polymoniales is included in the order solanaceae based on the floral characters.

A) Both Assertion and Reason are true and Reason is correct explanation of Assertion.
B) Both Assertion and Reason are true, but Reason is not the correct explanation of Assertion.
C) Assertion is true, but Reason is false. D) Assertion is false, but Reason is true.

63. Assertion: Wheat belongs to the family poaceae.
Reason: Wheat is a member of order poales.
A) Both Assertion and Reason are true and Reason is correct explanation of Assertion.
B) Both Assertion and Reason are true, but Reason is not the correct explanation of Assertion.
C) Assertion is true, but Reason is false. D) Assertion is false, but Reason is true.

64. Which of the following options represents the correct classification for the given animal?

	Phylum	Class	Order	Family	Genus	Species
A)	Chordata	Vertebrata	Chiroptera	Felidae	Canis	Tigris
B)	Chordata	Mammalia	Carnivora	Felidae	Panthera	Tigris
C)	Vertebrata	Mammalia	Carnivora	Felidae	Panthera	Tigris

D) Mammalia Felidae Carnivora Feliaceae Panthera Leo

Taxonomical Aids

65. Taxonomic studies of various organisms are useful in
A) agriculture B) forestry C) industry D) all of these

66. Taxonomic studies require
A) correct classification
B) correct identification of organisms
C) intensive laboratory and field studies
D) all of these

67. A store house of collected plant specimens that are dried, pressed and preserved on sheets is a

A) herbarium B) botanical garden
C) zoological park D) catalogue

68. Among the following, which information is not provided by the herbarium sheet about a plant?

A) Collector's name B) Place of collection
C) Economic importance of plant species D) Botanical name of the plant

69. The specialized gardens having collections of living plants for reference are
A) Herbarium B) Botanical gardens
C) Zoological parks D) Museum

70. Match the Column-I and Column-II and choose the correct option from the codes given below:

Column-I	Column-II
a Kew Botanical Garden	(1) Dehradun
B Indian Botanical Garden	(2) Lucknow
c National Botanical Research Institute	(3) England
d Forest Research Institute	(4) Howrah

Codes -

a b c d	a b c d
A) 3 4 2 1	B) 4 2 3 1
C) 1 3 4 2	D) 2 1 3 4

71. National Botanical Research Institute is situated at
A) Howrah B) Lucknow C) Dehradun D) Delhi

72. Choose the incorrect statement from the following:
A) Herbarium is a storehouse of collected plant specimens that are dried, pressed and preserved on sheets.
B) Herbaria serve as quick referral systems in taxonomical studies.
C) Botanical gardens have collection of preserved plant materials also.
D) Indian Botanical Garden is situated at Howrah, India.

73. Biological museums have collection of
A) preserved plant specimens B) preserved animal specimens
C) live plants and animals D) both A and B

74. Insects are preserved in insect boxe
A) in preservative solutions B) after stuffing
C) after collecting, killing and pinning D) as skeletons

75. Match Column-I with Column-II and choose the correct option from the codes given below:

Column-I(Organism)	Column-II (Method of preservation)
a Birds	(1) Skeleton
b Human	(2) Preservative solution
c Insects	(3) Stuffing
d Small animals	(4) In boxes after killing and pinning

Codes -

a b c d	a b c d
A) 3 1 4 2	B) 4 3 2 1

C) 1 2 3 4 D) 2 4 1 3

76. The place where wild animals are kept in protected environment is
A) botanical garden B) zoological park
C) museum D) herbarium

77. Zoological parks are commonly known as
A) museum B) garden C) zoo D) none of these

78. Zoological parks and botanical gardens have a collection of
A) exotic living species only B) endemic living species only
C) both A and B D) only local plants and animals

79. Plants and animals are identified by key on the basis of their
A) morphology B) anatomy
C) similarities and dissimilarities D) all of these

80. The keys are based on contrasting characters generally in a pair called
A) couplet B) doublet C) triplet D) all of these

81. The contrasting characteristics generally in a pair used for identification of animals in Taxonomic key are referred to as
A) Lead B) Couplet C) Doublet D) Alternate

82. Taxonomic key is used in the preparation of the
A) monographs B) flora C) both A and B D) none of these

83. Each statement of the key is called a
A) couplet B) lead C) monograph D) none of these

84. Match items given in Column-I with those in Column-II and select the correct option given below.

Column-I	**Column-II**
a Herbarium	(1) It is a place having a collection of preserved plants and animals.
b Key	(2) A list that enumerates methodically all the species found in an area with brief description aiding identification.
c Museum	(3) It is a place where dried and pressed plant specimens mounted on sheets are kept.
d Catalogue	(4) A booklet containing a list of characters and their alternates which are helpful in identification of various taxa.

Codes –

a b c d a b c d
A) 1 4 3 2 B) 3 2 1 4
C) 2 4 3 1 D) 3 4 1 2

85. Choose the correct statements about taxonomic keys.
I. It is used for the identification of only plants.
II. Each statement in the key is called a lead.
III. No separate taxonomic keys are required for different taxonomic categories.
A) II and III B) I and II C) III and I D) II only

86. Among the following which one is not a taxonomic aid?
A) Flora B) Manual C) Taxon D) Key

87. Among the following which one contains information on any one taxon?
A) Flora B) Monograph C) Manual D) Catalogue

88. Assertion: Herbarium is a storehouse of collected plant specimens that are dried, pressed and preserved on sheets.
Reason: Herbaria serve as quick referral systems in taxonomical studies.
A) Both Assertion and Reason are true and Reason is correct explanation of Assertion.
B) Both Assertion and Reason are true, but Reason is not the correct explanation of Assertion.
C) Assertion is true, but Reason is false. D) Assertion is false, but Reason is true.

89. Assertion: Museums have collection of live plants and animals.
Reason: In museums, as far as possible, conditions similar to their natural habitat are provided.

A) Both Assertion and Reason are true and Reason is correct explanation of Assertion.
B) Both Assertion and Reason are true, but Reason is not the correct explanation of Assertion.
C) Assertion is true, but Reason is false. D) Assertion is false, but Reason is true.

90. Assertion: The taxonomical keys are based on the contrasting characters.
Reason: Each statement in the key is called a couplet.
A) Both Assertion and Reason are true and Reason is correct explanation of Assertion.
B) Both Assertion and Reason are true, but Reason is not the correct explanation of Assertion.
C) Assertion is true, but Reason is false.
D) Assertion is false, but Reason is true.

NEET PREVIOUS YEARS QUESTIONS

1. Match the items given in column I with those in column II and select the correct option given below:

Column I	**Column II**
A. Herbarium	I. It is a place having a collection of preserved plants and animals.
B. Key	II. A list that enumerates methodically all the species found in an area with brief description aiding identification.
C. Museum	III. It is a place where dried and pressed plant specimens mounted on sheets are kept.
D. Catalogue	IV. A booklet containing a list of characters and their alternates which are helpful in identification of various taxa.

(a) A – I; B – IV; C – III; D – II(b) A – III; B – II; C – I; D – IV
(c) A – III; B – IV; C – I; D – II(d) A – II; B – IV; C – III; D – I

2. Nomenclature is governed by certain universal rules. Which one of the following is contrary to the rules of nomenclature?
(a) Biological names can be written in any language.
(b) The first word in a biological name represents the genus name, and the second is a specific epithet.
(c) The names are written in Latin and are italicised.
(d) When written by hand, the names are to be underlined.

3. It is much easier for a small animal to run uphill than for a large animal, because
(a) it is easier to carry a small body weight.
(b) smaller animals have a higher metabolic rate.
(c) small animals have a lower O2 requirement.
(d) the efficiency of muscles in large animals is less than in the small animals.

4. Select correctly written scientific name of Mango which was first described by Carolus Linnaeus

(a) Mangifera indica Car. Linn. (b) Mangifera indica Linn.
(c) Mangifera indica (d) Mangifera Indica

5. The contrasting characteristics generally in a pair used for identification of animals in Taxonomic Key are referred to as :
(a) Lead (b) Couplet (c) Doublet (d) Alternate

NCERT LINE BY LINE QUESTIONS – ANSWERS

1) D	2) B	3) C	4) A	5) C	6) D	7) B	8) D	9) A	10) C
11) C	12) D	13) B	14) D	15) A	16) D	17) B	18) C	19) A	20) A
21) D	22) C	23) D	24) D	25) D	26) B	27) A	28) A	29) B	30) B
31) D	32) D	33) B	34) C	35) A	36) B	37) D	38) C	39) A	40) A
41) A	42) C	43) D	44) D	45) B	46) D	47) D	48) C	49) A	50) C
51) C	52) C	53) B	54) B	55) B	56) A	57) A	58) C	59) B	60) C
61) A	62) C	63) B	64) B	65) D	66) D	67) A	68) C	69) B	70) A
71) B	72) C	73) D	74) C	75) C	76) B	77) C	78) C	79) C	80) A
81) B	82) C	83) B	84) B	85) D	86) C	87) B	88) D	89) C	90) C

NEET PREVIOUS YEARS QUESTIONS-ANSWERS

1 (c) **2** (a) **3** (b) 4(2) 5(2)

NEET PREVIOUS YEARS QUESTIONS-EXPLANATIONS

1. (c) Herbarium is a place where dried and pressed plant specimen mounted on sheets are kept systematically.

Key is the Identification of various taxa. Museum is an institution where plant and animal specimen are exhibited to public. A collection may include scientific specimen works of arts etc. Catalogue is an alphabetical listing of species.

2. (a) Binomial nomenclature is a formal system of naming species of living things by giving each a name composed of two parts, both of which use Latin grammatical forms, although they can be based on words from other languages.

3. (b) Basal metabolic rate is inversely proportional to body size. So, smaller animals have a higher metabolic rate. Hence, production of energy is more.