



BIOLOGY

NEET CLASS - XI

MODULE - I

- REPRODUCTION IN ORGANISMS
- SEXUAL REPRODUCTION IN FLOWERING PLANTS
- HUMAN REPRODUCTION
- REPRODUCTIVE HEALTH

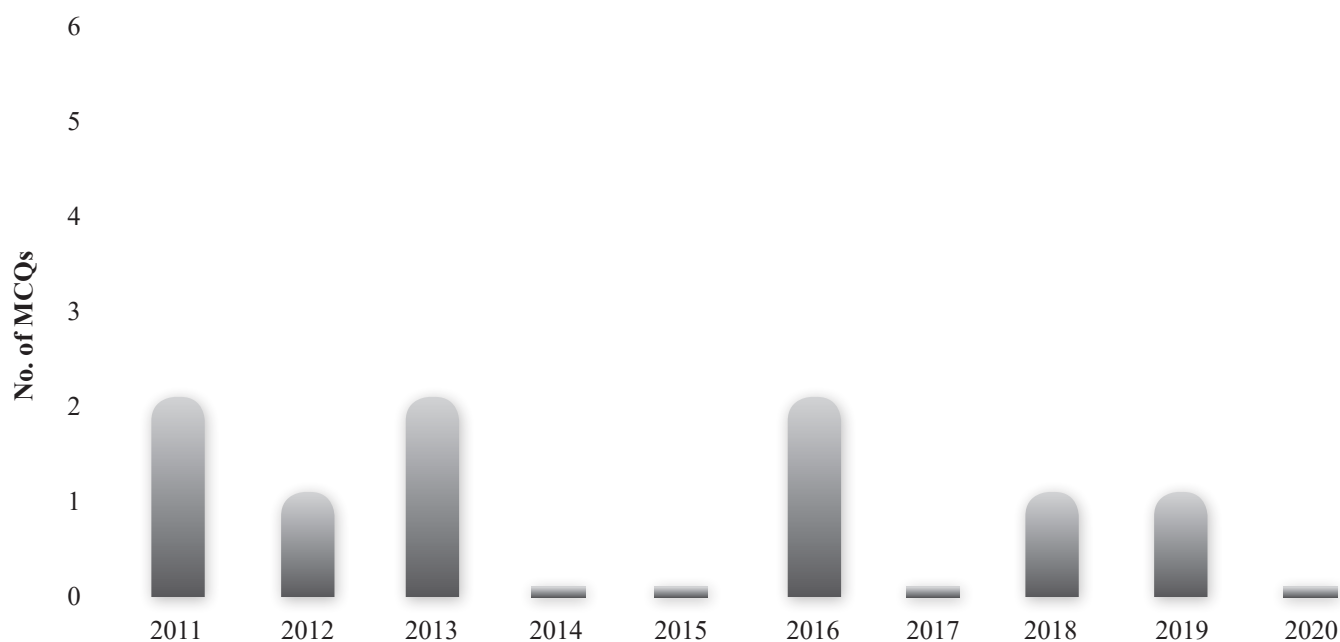


Physics Wallah

CHAPTER 1

The Living World

Past Year NEET Trend



Investigation Report

TARGET EXAM	PREDICTED NO. OF MCQs	CRITICAL CONCEPTS
NEET 2021	0-1	<ul style="list-style-type: none"> • Binomial nomenclature • Taxonomic category • Taxonomical aids

Perfect Practice Plan

TOPIC-WISE MCQs	NCERT BASED MCQs	MULTI-CONCEPT MCQs	NEET PAST 10 YEAR QUESTIONS	TOTAL MCQs
110	38	30	11	189

INTRODUCTION

- ☺ The **complex organisation of molecules** that have the tendency to express themselves through various chemical reactions are designated as living beings.
- ☺ The **basic purpose** of these reactions is to produce and utilise energy which lead to growth, development, responsiveness, reproduction and other characteristics of life.
- ☺ The living beings live in different types of habitats like forests, mountains, deserts, oceans, freshwater bodies, hot springs, polar regions, etc.

WHAT IS 'LIVING'?

There are certain distinctive characteristics exhibited by living organisms which distinguish them from non-living.

Unique Characteristics of Living Organisms

The most distinctive features exhibited by living organisms includes:

1. Growth

- ☺ All living organisms have the capacity to grow.
- ☺ In plants, growth occurs continuously throughout their life span. In animals, this growth is seen only up to a certain age. However, cell division occurs in certain tissues to replace lost cells
- ☺ Growth of an individual organism has **two** characteristics (**twin characters**):
 - (i) Increase in body mass
 - (ii) Increase in number
- ☺ In majority of higher animals and plants, growth and reproduction are **mutually exclusive events**. One must remember that increase in body mass is considered as growth.
- ☺ Non-living objects also grow by accumulation of material on the surface. E.g., mountains, boulders and sand mounds. Growth, therefore, **cannot** be taken as a defining property of living organisms.

— KEY NOTE —

In living organisms, the growth is internal but in non-living organisms, the growth is external.

2. Reproduction

- ☺ Reproduction is a characteristic of living organisms.
- ☺ No non-living object is capable of reproducing or replicating by itself.
- ☺ In multicellular organisms, reproduction refers to the **production of progeny** possessing features more or less similar to those of parents.
- ☺ Organisms reproduce by both sexual and asexual means. For example, fungi multiply and spread easily due to the millions of asexual spores they produce.

- ☺ The lower organisms like yeast and *Hydra*, reproduce by budding. In *Planaria* (flat worms), the mode of reproduction is **true regeneration**, i.e., a fragmented organism regenerates the lost part of its body and becomes a new organism.
- ☺ The fungi, the filamentous algae, the protonema of mosses, all easily multiply by fragmentation.
- ☺ Unicellular organisms such as bacteria, unicellular algae or *Amoeba*, reproduction is synonymous with growth, i.e., increase in number of cells.

— KEY NOTE —

Many organisms such as mules, sterile worker bees, infertile human couples, etc., do not reproduce. Hence, reproduction also **cannot** be an all-inclusive defining characteristic of living organisms.

3. Metabolism and Cellular Organisation

- ☺ All living organisms are made up of chemicals. These chemicals, small and big, belonging to various classes, sizes, functions, etc., are constantly being made and changed into some other biomolecules. These conversions are **chemical reactions** or **metabolic reactions**.
- ☺ The sum total of all the chemical reactions occurring in our body is called **metabolism**.
- ☺ No non-living object exhibits metabolism.
- ☺ An isolated metabolic reaction(s) outside the body of an organism, performed in a test tube is neither living nor non-living. Hence, while metabolism is a **defining feature** of all living organisms **without exception**.
- ☺ Isolated metabolic reactions *in vitro* are not living things but surely living reactions. Hence, cellular organisation of the body is the **defining feature of life forms**.

4. Consciousness

- ☺ The most obvious and technically complicated feature of all living organisms is the ability to sense their surroundings or environment and respond to these environmental stimuli which could be physical, chemical or biological.
- ☺ All organisms, from the prokaryotes to the most complex eukaryotes can sense and respond to environmental cues. Plants respond to external factors like light, water, temperature, other organisms, pollutants, etc.
- ☺ Photoperiod affects reproduction in seasonal breeders, both plants and animals. All organisms handle chemicals entering their bodies.
- ☺ All organisms therefore are 'aware' of their surroundings.

— KEY NOTE —

Human being is the only organism who is aware of himself, i.e., has self-consciousness. Consciousness therefore becomes the defining property of living organisms.

- ☺ Living organisms are self-replicating, evolving and self-regulating interactive systems capable of responding to external stimuli.

Topic-wise Questions

What is Living?

- Among the following which can be a common feature exhibited by both living and non-living?
 - Growth
 - Reproduction
 - Metabolism
 - Cellular organisation
- Among the following, increase in body mass can be taken as criterion for growth
 - In living organisms
 - In non-living objects
 - Both (a) and (b)
 - None of the above
- How many (in number) of the following properties are the defining characteristics of living organisms?
Growth, reproduction, metabolism, cellular organisation, consciousness
 - 2
 - 3
 - 4
 - 5
- Self-consciousness (the awareness of himself) is the property of
 - All living organisms
 - Prokaryotes only
 - Eukaryotes only
 - Human being only
- Two characteristics of growth are
 - Increase in length
 - Increase in width
 - Increase in mass and number
 - Both (a) and (b)
- Growth and reproduction are mutually exclusive events in
 - Lower plants
 - Lower animals
 - Higher animals and plants
 - Unicellular organisms
- Non-living objects also grow if we take increase in body mass as a criterion for growth. In mountains, boulders and sand mounds growth is from
 - Outside
 - Inside
 - Both
 - None of the above
- The most important feature of all living systems is to
 - Utilise oxygen to generate energy
 - Replicate the genetic information.
 - Produce gametes
 - Utilise solar energy for metabolic activities.
- The sum total of chemical reactions occurring in our body is called
 - Metabolism
 - Homeostasis
 - Irritability
 - Catabolism

- Which of the following biological processes does not operate within the life span of a given organism?
 - Birth and nutrition
 - Growth and maturation
 - Metabolism and excretion
 - Decomposition and mineralisation
- Growth, development and functioning of living body is due to
 - Order
 - Homeostasis
 - Metabolism
 - Adaptation
- Which is the most important criteria but generally not used for the identification of the species?
 - Interbreeding
 - Morphology
 - Genetic material
 - Anatomy
- Match the column I and II, and choose the correct combination from the options given.

Column - I	Column - II
A. Fungi	i. Asexual spores
B. <i>Amoeba</i>	ii. Binary fission
C. <i>Hydra</i> and Yeast	iii. True regeneration
D. <i>Planaria</i>	iv. Budding

- A-i, B-ii, C-iii, D-iv
 - A-i, B-ii, C-iv, D-iii
 - A-ii, B-i, C-iv, D-iii
 - A-iii, B-i, C-ii, D-iv
- Which of the following organisms are multiplied by fragmentation?
 - Fungi
 - All algae
 - Protonema of mosses
 - A and B
 - B and C
 - A, B and C
 - A and C

Diversity in Living World

- ICBN codes for
 - International code for Botanical Nomenclature
 - International code for Binomial Nomenclature
 - International code for Botanical Naming
 - International code for Binomial Naming
- In *Mangifera indica*, *indica* indicates
 - Name of the genus
 - Name of the species
 - Specific epithet
 - Both (b) and (c)
- ICZN codes for:
 - International code of zoological Nomenclature
 - International code of zoological Naming
 - International coding of zoological Nomenclature
 - Inbreeding code of zoological Nomenclature

NCERT Based Questions

- As we go from species to kingdom in a taxonomic hierarchy, the number of common characteristics:
 - Will decrease
 - Will increase
 - Remain same
 - May increase or decrease
- The term 'systematics' refers to:
 - Identification and study of organ systems
 - Identification and preservation of plants and animals
 - Diversity of kinds of organisms and their relationship
 - Study of habitats of organisms and their classification
- Among the following, select the correct statements.
 - In majority of higher plants and animals, growth and reproduction are mutually exclusive events.
 - In non-living objects growth is by accumulation of material on the surface.
 - An isolated metabolic reaction outside the body of an organism, performed in a test tube is neither living nor non-living.
 - All organisms, from the prokaryotes to the most complex eukaryotes can sense and respond to environmental cues.
 - B, C and D
 - A, B and C
 - A, D and C
 - All of these
- The process by which anything grouped into convenient categories based on some easily observable characters is called
 - Systematics
 - New Systematics
 - Nomenclature
 - Classification
- Recognise the following flow diagram and find the correct options according to taxonomic hierarchy.


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graph BT
    Mangifera[Mangifera] --> A[A]
    A --> B[B]
    B --> C[C]
    C --> Angiospermae[Angiospermae]
          
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 - 'A' is comparable to muscidae while 'B' is at the same level as that of primata.
 - 'C' includes all the angiosperms having two cotyledons in their seeds.
 - For wheat 'A' is poaceae, 'B' is poales and 'C' is monocotyledonae.
 - All of the above statements are correct.
- Genus represents:
 - An individual plant or animal
 - A collection of plants or animals
 - Group of closely related species of plants or animals
 - A group of plants in a given area.
- The taxonomic unit 'Phylum' in the classification of animals is equivalent to which hierarchical level in classification of plants:
 - Class
 - Order
 - Division
 - Family
- Which of the following are true with reference to taxonomical aids?
 - Separate taxonomic keys are required for each taxonomic category.
 - Herbarium is a store house of collected plant and animal specimens.
 - Each statement in the key is called couplet.
 - Keys are used for identification purpose.
 - A and B
 - A and D
 - A and C
 - C and D
- Select the wrong statements.
 - Lower the taxon, more are the characteristics that the members within the taxon share.
 - Order is the assemblage of genera which exhibit a few similar characters.
 - Cat and dog are included in the same family Felidae.
 - Binomial nomenclature was introduced by Carolus Linnaeus.
 - A, B and C
 - B, C and D
 - A and D
 - B and C
- All living organisms are linked to one another because
 - They show common genetic material but to varying degree
 - They have common genetic material of the same type
 - All have common cellular organisation
 - All of the above
- Botanical gardens and Zoological parks have:
 - Collection of endemic living species only
 - Collection of exotic living species only
 - Collection of endemic and exotic living species
 - Collection of only local plants and animals
- Two animals belong to the same kingdom but different classes. They may belong to the same
 - Phylum
 - Order
 - Division
 - Family

Multi-Concept Questions

- Herbarium is:
 - A garden where medicinal plants are grown
 - Garden where herbaceous plants are grown
 - Dry garden
 - Chemical to kill plants
- Incorrect statement are:
 - Animals, mammals, dogs, alsatians represent taxa at different levels.
 - Phenotypic plasticity is the ability of an organism to change its phenotype in response to environment.
 - Nomenclature is only possible when the organism is described correctly.
 - In animals, growth is seen only up to a certain age.
 - Non-living objects also grow if we take increase in body mass as a criteria of growth.
 - Human being is the only organism who is aware of himself.
 - C only
 - B only
 - A only
 - All are correct
- Which one of the following branch is applicable to both plants and animals?
 - Herpetology
 - Saurology
 - Taxonomy
 - Ichthyology
- Read the following and choose the correct combinations:

Scientist	Coined the term
A. A.P. de Candolle	1. Biology
B. Herbert Spencer	2. Genetics
C. Lamarck	3. Taxonomy
D. Ernst Haeckel	4. Ecology
E. Bateson	5. Organic evolution

 - A-3 B-5 C-2 D-4 E-1
 - A-3 B-5 C-1 D-4 E-2
 - A-1 B-3 C-5 D-2 E-4
 - A-4 B-2 C-5 D-1 E-4
- Read the following and choose the correct combinations:

A. Species	1. A group of similar individuals
B. Family	2. Includes related orders
C. Division	3. A group of related genera
D. Class	4. Occur below kingdom and above class

 - A-3 B-1 C-4 D-2
 - A-2 B-1 C-4 D-3
 - A-3 B-1 C-2 D-4
 - A-1 B-3 C-4 D-2
- For higher plants, flowers are chiefly used as a basis of classification, because:
 - These show a great variety in colour
 - It can be preserved easily
 - Reproductive parts are more conservative than vegetative parts
 - They have strong fragrance
- Which of the following species are restricted to a given area?
 - Sympatric species
 - Allopatric species
 - Sibling species
 - Endemic species
- The most obvious & complicated feature of all living organisms is:
 - The ability to sense their surroundings or environment and respond to these environmental stimuli.
 - Reproduction - sexual or asexual - for production of progeny of own kind.
 - The ability to growth in size due to cell division.
 - Presence of complex organs systems such as digestive and nervous system.
- Match the columns and find out the correct combination:

Common name	Biological name
A. Tobacco	1. <i>Mangifera indica</i>
B. Potato	2. <i>Triticum vulgare</i>
C. Brinjal	3. <i>Nicotiana tabacum</i>
D. Wheat	4. <i>Solanum tuberosum</i>
	5. <i>Solanum melongena</i>

 - A-4 B-3 C-1 D-2
 - A-3 B-4 C-5 D-2
 - A-1 B-2 C-3 D-4
 - A-2 B-1 C-4 D-3
- The most convenient way for easy identification of plants and animals by applying diagnostic feature is use of
 - Herbarium
 - Botanical gardens
 - Museum
 - Taxonomic keys
- Classification systems have many advantages. Which of the following is not a goal of biological classification?
 - To depict convergent evolution
 - To clarify relationships among organisms
 - To help us remember organisms and their traits
 - To identify and name organisms

NEET Past 10 Year Questions

- Select the correctly written scientific name of Mango which was first described by Carolus Linnaeus (2019)
 - Mangifera indica* Car. Linn.
 - Mangifera indica* Linn.
 - Mangifera indica*
 - Mangifera Indica
- Match the items given in Column I with those in Column II and select the correct option given below (2018)

	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.	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-i B-iv C-iii D-ii
 - A-iii B-ii C-i D-iv
 - A-ii B-iv C-iii D-i
 - A-iii B-iv C-i D-ii
- Given below are the various taxonomic aids used in taxonomy which facilitate identification and classification of organisms. Which one of the following is wrong? (2017-Gujarat)
 - Keys, floras, manuals, monographs and catalogues are useful aids for identification of plants and animals
 - Herbarium is created to house live specimens of plant material
 - Museums are established to keep preserved specimens of animals and plants
 - Botanical gardens and Zoological parks are established to conserve and preserve live plants and animals respectively
 - Study the four statements (A–D) given below and select the two correct ones out of them: (2016 -II)
 - Definition of biological species was given by Ernst Mayr.
 - Photoperiod does not affect reproduction in plants.
 - Binomial nomenclature system was given by R.H. Whittaker.
 - In unicellular organisms, reproduction is synonymous with growth.

The two correct statements are

- A and D
 - A and B
 - B and C
 - C and D
- The label of a herbarium sheet does not carry information on: (2016 - II)
 - Local names
 - Height of the plant
 - Date of collection
 - Name of collector
 - Match Column–I with Column–II for housefly classification and select the correct option using the codes given below: (2016 - II)

	Column - I		Column - II
A.	Family	(i)	Diptera
B.	Order	(ii)	Arthropoda
C.	Class	(iii)	Muscidae
D.	Phylum	(iv)	Insecta

Codes:

- A-iv B-iii C-ii D-i
 - A-iv B-ii C-i D-iii
 - A-iii B-i C-iv D-ii
 - A-iii B-ii C-iv D-i
- Which one of the following is not a correct statement? (2013)
 - Key is a taxonomic aid for identification of specimens.
 - Herbarium houses dried, pressed and preserved plant specimens.
 - Botanical gardens have collection of living plants for reference.
 - A museum has collection of photographs of plants and animals.
 - Which of the following organisms is scientifically correctly named, correctly printed according to International Rules of Nomenclature and correctly described? (2012 Mains)
 - Musca domestica*-The common house lizard, a reptile
 - Plasmodium falciparum*-A protozoan pathogen causing the most serious type of malaria
 - Felis tigris*-The Indian tiger, well protected in Gir Forests.
 - E.coli*-Full name *Entamoeba coli*, a commonly occurring bacterium in human intestine.
 - Which one of the following aspects is an exclusive characteristic of living things? (2011 Mains)
 - Perception of events happening in the environment and their memory
 - Increase in mass by accumulation of material both on surface as well as internally
 - Isolated metabolic reactions occur *in vitro*
 - Increase in mass from inside only

1. The Living World

Topic-wise Questions

1. (a) Growth is a common characteristic exhibited by both living and non-living.
2. (c) In living organisms and in non-living objects increase in body mass can be taken as criterion for growth.
3. (a) Metabolism, and consciousness are the defining property of living organism without exception. Growth and reproduction are not the defining property as they have certain exceptions.
4. (d) Self-consciousness is found in human beings only while consciousness is present in all organism, from the prokaryotes to the most complex eukaryotes.
5. (c) Increase in mass and increase in number of individuals are twin characteristics of growth.
6. (c) In majority of higher animals and plants, growth and reproduction are mutually exclusive events.
7. (a) In non-living objects growth is by accumulation of material on the surface.
8. (b) Replication of the genetic information is most important feature of living organisms which causes transfer of genetic information from one generation to the next. It is very important feature of all living organisms.
9. (a) The sum total of chemical reactions occurring in our body is called metabolism.
10. (d) The biological processes operate within the life span of a given organism includes giving birth to new ones, take and provide food for nutrition, growth and maturation, metabolic reactions and excretion of waste substances.
11. (c) Metabolism enables a living body to grow, develop and function according to the need and environments.
12. (a)
13. (b)
- | Column I | Column II |
|---------------------------|------------------------|
| A. Fungi | i. Asexual spore |
| B. <i>Amoeba</i> | ii. Binary fission |
| C. <i>Hydra</i> and Yeast | iv. Budding |
| D. <i>Planaria</i> | iii. True regeneration |
14. (d) The fungi, the filamentous algae (not all algae), the protonema of mosses, all easily multiply by fragmentation.
15. (a)
16. (d) In *Mangifera indica*, *indica* indicates specific epithet or name of species.
17. (a)
18. (a)
19. (b) In binomial nomenclature, the name of an organism consists of name of genus and species.
20. (d) One scientific name cannot be used for two related species.
21. (b) Animal taxonomists have evolved International Code of Zoological Nomenclature (ICZN).
22. (a)
23. (c)
24. (b) Modern day classification includes all the characteristics of organisms gathered from the study of different fields like physiology, ecology, anatomy, biochemistry, cytology, etc.
25. (c) Phenetic classification is based upon easily observable characteristics of an organism.
26. (d) Carl Linnaeus published a book *Philosophia Botanica* in which he introduced binomial nomenclature for the first time.
27. (d)
28. (a) The concept of new systematics was developed by Julian Huxley.
29. (d) In biological name, the first word starts with a capital letter and the second word (specific epithet) starts with a small letter. Both the words, when printed, are in italics to indicate their Latin origin.
30. (b) Trinomial nomenclature of gorilla is *Gorilla gorilla gorilla*.
31. (a) John Ray described species as a unit of classification.
32. (a)
33. (b) Human being were since long, not only interested in knowing more about different kinds of organisms and their diversities, but also the relationship among them. This branch of study is referred to as systematics.
34. (c) Characterisation, identification, classification and nomenclature are the processes that are basic to taxonomy.
35. (c) Nomenclature or naming is only possible when the organism is described correctly and we know to what organism the name is attached to. This is known as identification.
36. (b) The naming of living organisms such that a particular organism is known by the same name all over the world. This process is called nomenclature.
37. (d)
38. (b)
39. (a) Scientific name ensures that each organism has only one name all over the world.
40. (a) Binomial system is practised by biologist all over the world.
41. (a) The word systematics is derived from systema which is a Latin word.