

# The Living World

## 1.1 What is Living?

1. Which one of the following aspects is an exclusive characteristic of living things?
  - (a) Isolated metabolic reactions occur *in vitro*
  - (b) Increase in mass from inside only
  - (c) Perception of events happening in the environment and their memory.
  - (d) Increase in mass by accumulation of material both on surface as well as internally.

(Mains 2011)
2. The living organisms can be unexceptionally distinguished from the non-living things on the basis of their ability for
  - (a) interaction with the environment and progressive evolution
  - (b) reproduction
  - (c) growth and movement
  - (d) responsiveness to touch.

(2007)
3. Biological organisation starts with
  - (a) cellular level
  - (b) organismic level
  - (c) atomic level
  - (d) submicroscopic molecular level.

(2007)

## 1.2 Diversity in the Living World

4. Select the correctly written scientific name of Mango which was first described by Carolus Linnaeus.
  - (a) *Mangifera Indica*
  - (b) *Mangifera indica* Car. Linn.
  - (c) *Mangifera indica* Linn.
  - (d) *Mangifera indica*

(NEET 2019)
5. Which of the following is against the rules of ICBN?
  - (a) Hand written 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 italicized.

- (d) Generic and specific names should be written starting with small letters.

(Odisha NEET 2019)

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

(NEET-I 2016)
7. ICBN stands for
  - (a) International Code of Botanical Nomenclature
  - (b) International Congress of Biological Names
  - (c) Indian Code of Botanical Nomenclature
  - (d) Indian Congress of Biological Names.

(2007)
8. Biosystematics aims at
  - (a) the classification of organisms based on broad morphological characters
  - (b) delimiting various taxa of organisms and establishing their relationships
  - (c) the classification of organisms based on their evolutionary history and establishing their phylogeny on the totality of various parameters from all fields of studies
  - (d) identification and arrangement of organisms on the basis of their cytological characteristics.

(2003)
9. The book '*Genera Plantarum*' was written by
  - (a) Engler and Prantl
  - (b) Bentham and Hooker
  - (c) Bessey
  - (d) Hutchinson.

(1999)

10. Linnaeus is credited with  
 (a) binomial nomenclature  
 (b) theory of biogenesis  
 (c) discovery of microscope  
 (d) discovery of blood circulation. (1993)
11. Linnaeus evolved a system of nomenclature called  
 (a) monomial (b) vernacular  
 (c) binomial (d) polynomial. (1990)
12. The term "New Systematics" was introduced by  
 (a) Bentham and Hooker  
 (b) Linnaeus  
 (c) Julian Huxley  
 (d) A.P. de Candolle. (1988)

### 1.3 Taxonomic Categories

13. Match column I with column II for housefly classification and select the correct option using the codes given below.

#### Column I

- A. Family  
 B. Order  
 C. Class  
 D. Phylum

#### Column II

- (i) Diptera  
 (ii) Arthropoda  
 (iii) Muscidae  
 (iv) Insecta

- (a) A-(iii), B-(i), C-(iv), D-(ii)  
 (b) A-(iii), B-(ii), C-(iv), D-(i)  
 (c) A-(iv), B-(iii), C-(ii), D-(i)  
 (d) A-(iv), B-(ii), C-(i), D-(iii) (NEET-II 2016)

14. The common characteristics between tomato and potato will be maximum at the level of their  
 (a) family (b) order  
 (c) division (d) genus. (Karnataka NEET 2013)

15. Which one of the following organisms is scientifically correctly named, correctly printed according to the International Rules of Nomenclature and correctly described?  
 (a) *Musca domestica* - the common house lizard, a reptile  
 (b) *Plasmodium falciparum* - a protozoan pathogen causing the most serious type of malaria.  
 (c) *Felis tigris* - the Indian tiger, well protected in Gir forests.  
 (d) *E.coli* - full name *Entamoeba coli*, a commonly occurring bacterium in human intestine. (Mains 2012)

16. Which one of the following animals is correctly matched with its particular taxonomic category?  
 (a) Tiger - *tigris*, species

- (b) Cuttlefish - mollusca, class  
 (c) Humans - primata, family  
 (d) Housefly - *Musca*, order (2011)

17. Species are considered as  
 (a) real basic units of classification  
 (b) the lowest units of classification  
 (c) artificial concept of human mind which cannot be defined in absolute terms  
 (d) real units of classification devised by taxonomists. (2003)

18. Which of the following is less general in characters as compared to genus?  
 (a) Species (b) Division  
 (c) Class (d) Family (2001)

19. 'Taxon' is the unit of a group of  
 (a) order (b) taxonomy  
 (c) species (d) genes. (1996)

20. Sequence of taxonomic categories is  
 (a) class-phylum-tribe-order-family-genus-species  
 (b) division-class-family-tribe-order-genus-species  
 (c) division-class-order-family-tribe-genus-species.  
 (d) phylum-order-class-tribe-family-genus-species. (1992)

21. The term phylum was given by  
 (a) Cuvier (b) Haeckel  
 (c) Theophrastus (d) Linnaeus. (1992)

22. A group of plants or animals with similar traits of any rank is  
 (a) species (b) genus  
 (c) order (d) taxon. (1992, 1991)

23. A taxon is  
 (a) a group of related families  
 (b) a group of related species  
 (c) a type of living organisms  
 (d) a taxonomic group of any ranking. (1992, 1990)

24. Basic unit or smallest taxon of taxonomy/ classification is  
 (a) species (b) kingdom  
 (c) family (d) variety. (1990)

25. Static concept of species was put forward by  
 (a) de Candolle (b) Linnaeus  
 (c) Theophrastus (d) Darwin. (1988)

### 1.4 Taxonomical Aids

26. 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) 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	B	C	D
(a) (i)	(iv)	(iii)	(ii)
(b) (iii)	(ii)	(i)	(iv)
(c) (ii)	(iv)	(iii)	(i)
(d) (iii)	(iv)	(i)	(ii)

(NEET 2018)

27. The label of a herbarium sheet does not carry information on  
 (a) date of collection (b) name of collector  
 (c) local names (d) height of the plant.

(NEET-II 2016)

28. Which one of the following is not a correct statement?  
 (a) A museum has collection of photographs of plants and animals.  
 (b) Key is a taxonomic aid for identification of specimens.  
 (c) Herbarium houses dried, pressed and preserved plant specimens.  
 (d) Botanical gardens have collection of living plants for reference.

(NEET 2013)

29. One of the most important functions of botanical gardens is that  
 (a) they provide a beautiful area for recreation  
 (b) one can observe tropical plants there  
 (c) they allow *ex situ* conservation of germplasm  
 (d) they provide the natural habitat for wild life.

(2005)

### ANSWER KEY

1. (c) 2. (d) 3. (d) 4. (c) 5. (d) 6. (c) 7. (a) 8. (c) 9. (b) 10. (a)  
 11. (c) 12. (c) 13. (a) 14. (a) 15. (b) 16. (a) 17. (a) 18. (a) 19. (b) 20. (c)  
 21. (b) 22. (d) 23. (d) 24. (a) 25. (b) 26. (d) 27. (d) 28. (a) 29. (c)

## Hints & Explanations

1. (c) 2. (d)

3. (d): Molecular assemblies are large organised sets of molecular units that make up parts of organelles. For example, one common macromolecular assembly is the microtubule which is important in forming structure in the cell related to maintaining the cell structure or related to cell movement. The cell (plasma) membrane surrounds many organelles and the cell is a highly organised molecular assembly.

4. (c): According to binomial nomenclature, the first word denoting the genus starts with a capital letter while the specific epithet starts with a small letter. *E.g.*, scientific name of mango is *Mangifera indica*. Name of the author appears after the specific epithet, *i.e.*, at the

end of biological name and is written in an abbreviated form, *e.g.*, *Mangifera indica* Linn. It indicates that this species was first described by Linnaeus.

5. (d): According to International Code for Botanical Nomenclature (ICBN) the first word denoting the genus starts with a capital letter while the specific epithet starts with a small letter.

6. (c): Biological names are derived either from Latin language or are latinised. This is because Latin language is a dead language and therefore it will not change in form or spellings with the passage of time.

7. (a): The International Code of Botanical Nomenclature (ICBN) is a set of rules and recommendations dealing with the formal botanical

names given to plant. The foundations of ICBN are given in book written by C. Linnaeus named *Philosophia Botanica*. It is independent of zoological nomenclature.

**8. (c) :** Biosystematics is the study of identification, nomenclature, classification and relationships amongst living beings. In other words, it is the study of diversity of organisms, their comparative and evolutionary relationships based on comparative anatomy, ecology, physiology, biochemistry and other fields.

**9. (b) :** Bentham and Hooker in their monumental work *Genera Plantarum* (1862-1883) have provided elaborate keys for the easy identification of 202 natural orders and genera.

**10. (a) :** Binomial nomenclature was first given by C. Linnaeus (1735) in his book "*Systema Naturae*" and later in "*Species Plantarum*" (1753). He used two latin words for any organism, the first being generic name and the second is specific name. The generic name begins with capital letter and the species name with small letter.

**11. (c) :** Refer to answer 10.

**12. (c) :** The term "New Systematics" was given by Julian Huxley (1940). This classification takes into account the cytological, morphological, genetical, anatomical, palynological and physiological characters.

**13. (a)**

**14. (a) :** Potato (*Solanum tuberosum*) and tomato (*Lycopersicum esculentum*) both belong to Family Solanaceae, which is commonly called as the "potato family". Many plants belonging to this family are sources of vegetables, fruits, etc.

**15. (b) :** *Plasmodium falciparum* is a protozoan parasite, one of the species of *Plasmodium* that causes malaria in humans. Being digenetic, its life cycle is complete in two hosts — man and mosquito.

**16. (a)**

**17. (a) :** Species is a natural population or group of natural populations of individuals which are genetically distinct and reproductively isolated with similar essential morphological traits. Species is also a genetically closed system because its members do not interbreed with members of other species.

**18. (a) :** A taxonomic hierarchy is the sequence of arrangement of taxonomic categories in a descending order during the classification of an organism. There are seven obligate categories - kingdom, division, class, order, family, genus and species. Species is the lowest category while kingdom is the highest category. The number of common characters is maximum in case of organisms placed in the lowest category. Number of common characters decreases with the rise in category. Species are the smallest group of individuals which can be recognized by ordinary methods as groups and which

are consistently and persistently different from other groups because their characters are less general.

**19. (b) :** Taxon refers to all the categories in the taxonomic hierarchy. It may be a kingdom, class, order, family, genus or species. It is any level of grouping of organisms. Each of these categories has been divided further into intermediate categories like subkingdom, subdivision, superclass, subgenus, subspecies, etc.

**20. (c)**

**21. (b)**

**22. (d) :** A taxon (plural taxa) or taxonomic unit, is a name designating an organism or group of organisms. A taxon is assigned a rank and can be placed at a particular level in a systematic hierarchy reflecting evolutionary relationships.

**23. (d) :** Refer to answer 22.

**24. (a) :** Basic unit or smallest taxon of taxonomy/classification is species. Species is a group of individuals that resemble one another in all essential morphological and reproductive characters so that they are able to interbreed freely and produce fertile offspring.

**25. (b)**

**26. (d)**

**27. (d) :** A herbarium is a collection of plants, which have been dried, pressed, mounted on herbarium sheets, identified and classified according to some approved system of classification. The storage of herbarium sheets forms a repository for future use. A printed label (7 × 12 cm) giving the following information is fixed on the lower, right corner of herbarium sheet:

(i) Scientific name of plant (ii) Common/vernacular name (iii) Family (iv) Locality (v) Date of collection (vi) Collection number (vii) Name of collector (viii) Plant characteristics (optional) (ix) Name of institution (optional).

**28. (a) :** Museums have collections of preserved plant and animal specimens for study and reference. Specimens are preserved in the containers or jars in preservative solutions. Plant and animal specimens may also be preserved as dry specimens. Insects are preserved in insect boxes after collecting, killing and pinning. Larger animals like birds and mammals are usually stuffed and preserved. Museums often have collections of skeletons of animals too.

**29. (c) :** *Ex situ* conservation means "offsite conservation". It is the process of protecting endangered species of plants and animals by removing it from an unsafe or threatened habitat and placing it or part of it under the care of humans. Botanical garden serve as *ex situ* conservation of germplasm of different plants, to maintain rare and endemic plant species and also to provide recreation and knowledge about plants to a common man.

