Chapter 1

The Living World

1. 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)

2. 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	(i) Diptera
B. Order	(ii) Arthropoda
C. Class	(iii) Muscidae
D. Phylum	(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)

3. Study the four statements (A-D) given below and select the two correct ones out of them.
A. Definition of biological species was given by Ernst Mayr.
B. Photoperiod does not affect reproduction in plants.
C. Binomial nomenclature system was given by R.H. Whittaker.
D. In unicellular organisms, reproduction is synonymous with growth.
The two correct statements are
(a) B and C (b) C and D
(c) A and D (d) A and B.
(NEET-II 2016)

4. 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)

5. 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)

6. 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)

7. 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)

8. 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)*

9. 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)

10. 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)

11. 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)*

12. 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)*

13. 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)*

14. 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)*

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

16. The book '*Genera Plantarum*' was written by
(a) Engler and Prantl
(b) Bentham and Hooker
(c) Bessey (d) Hutchinson.
(1999)

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

18. Linnaeus is credited with
(a) binomial nomenclature
(b) theory of biogenesis
(c) discovery of microscope
(d) discovery of blood circulation. *(1993)*

19. 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)*

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

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

22. 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)

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

24. Linnaeus evolved a system of nomenclature called
(a) mononomial (b) vernacular
(c) binomial (d) polynomial.
(1990)

25. The term "New Systematics" was introduced by
(a) Bentham and Hooker
(b) Linnaeus
(c) Julian Huxley
(d) A.P. de Candolle. *(1988)*

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

Answer Key

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

EXPLANATIONS

1. (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).

2. (a)

3. (c) : Photoperiod affects flowering and reproduction in plants. Binomial nomenclature system was given by Carolus Linnaeus.

4. (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.

5. (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.

6. (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.

7. (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. Its sexual cycle is completed in female *Anopheles* mosquito and infective individuals called sporozoites are formed. Which are transmitted to humans with the bite of infected female *Anopheles*. Asexual cycle is passed in man in two phases. Malaria caused by *P. falciparum* (also known as aestivo-autumnal, malignant tertian or pernicious malaria) is the most dangerous form of malaria, with the highest rate of complication and mortality. In this case fever cycle is of 48 hours and is often fatal to patient as it affects the brain.
Scientific name of common house lizard is *Hemidactylus* whereas *Musca domestica* is the scientific name of common housefly. Scientific name of Indian tiger is *Panthera tigris*. Full name of *E.coli* is *Escherichia coli*.

8. (a) : Binomial nomenclature system of naming organisms using a two-part Latinized (or scientific) name that was devised by the Swedish botanist Linnaeus (Carl Linne); it is also known as the Linnaean system. The first part is the generic name, the second is the specific name. Zoological name of tiger is *Panthera tigris*. So, *tigris* is species name of Tiger.

9. (c)

10. (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. The rank of species is basic and relative order of the ranks of taxa are as : species, genus, tribe, family, order, series, class, division and kingdom.
The different ranks or categories have following specific endings of their names as division – phyla, class-ae, family-aceae.

11. (d)

12. (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.

13. (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. Species

is lowest or basic taxonomic category, *e.g.*, mango (*Mangifera indica*), potato (*Solanum tuberosum*), lion (*Panthera leo*). Here *indica*, *tuberosum*, *leo* are species of genera *Mangifera*, *Solanum* and *Pantera* respectively. All other taxonomic categories are defined and described in relation to species. For example, a genus is a group of species and a subspecies or a variety is a part of species. New species originate from already existing species. Species is considered basic unit of taxonomy since in the greater majority of cases we do not have intraspecific names.

14. (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.

15. (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.

16. (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. Engler and Prantl wrote *Die naturlichen pflanzen familien*. Huchinson wrote a book titled "The Families of Flowering Plants."

17. (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. This term was coined by ICBN in 1956.

18. (a) : Binomial nomenclature of scientific naming 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.

19. (c) : To construct the hierarchy of classification, one or more species are grouped into a genus, one or more of genera into a family, families are clubbed into order, orders into class, classes into phylum and various phyla into kingdom.

20. (a) : The term phylum was given by Cuvier.

21. (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.

22. (d) : The word taxon signifies a taxonomic group of any rank which represents the real biological organisms included in a category. The term taxon was coined by Adolf Meyer (1926) for animals and H.J Lam (1948) used this term in plant science.

23. (a) : Basic unit or smallest taxon of taxonomy/ classification is species. Species is a group of individuals that remain relatively constant in their characteristics; can be distinguished from other species and do not normally interbreed.

24. (c) : *Refer to answer 18.*

25. (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.

26. (c).