Biodiversity:

Biodiversity refers to organisms found within the living world. It is also define as total varieties of organisms found in any particular area at particular time. It describes the richness and variety of life on earth. It is the most complex and important feature of our planet.

It is the abbreviation of Biological Diverstiy.

Biodiversity holds ecological and economic significance. It provides us with nourishment, housing, fuel, clothing and several other resources.

It is treated in terms of genes, species and ecosystems in correspondence with the three fundamental hierarchical levels of biological organization.

a) **Ecosystem diversity:** It deals with the different ecosystems in a certain location and their overall effects on human and the environment. There are large numbers of ecological niches, trophic levels that sustain energy flow, obtain food and recycle the nutrients.
b) **Species diversity:** It is defined as the number of different species present in an ecosystem and relative abundance of each of those species. Species are the important unit of diversity that alters the whole ecosystem when it loses. Hence, it plays very significant role in an ecosystem.
c) **Genetic diversity:** It is defined as the total number of genetic characteristics in the individual of a species. It occurs due to the recombination of genetic material in the process of inheritance. It changes with time and space.

Scope of Biodiversity: Biodiversity has a wide scope. It also describes the differences between living beings and the variation of life forms in the world. It plays a significant role in the lives of human providing direct and indirect benefits. Some of the scopes are discussed below.

a) **Medicinal field:** It plays very important role as medicines. It helps to know the various diseases are derived from variety of plants and animals. It also provides information about their occurrences as well as use to cure the various types of diseases.
b) **Industry:** It provides the raw materials to the different industries in the form of animals and plants.
c) **Agriculture:** It is another scope of biodiversity which gives different agricultural products that are the products from different animals and plants.
d) **Research and study:** It provides the unlimited resources for research and study.
e) **Job opportunity:** It gives opportunity for the people by programs and project that have been launched for biodiversity conservation.
f) **Environment conservation:** different living organisms respond with environment factors. Different living organism like plant and animals are respond with the environmental component. So, they have also to use and have

more important for them. Hence, they play vital role in environment conservation.

Importance of Biodiversity: Biodiversity are very important for sustaining life on earth. Some of the importance of biodiversity is discussed here.

a) **Food value:** Biodiversity is the source of food. All living organisms are depending upon biodiversity for food in various forms. Biodiversity show the inter-relationship between animals and plants in the form of food.
b) **Ecological stability:** The organism has specific role in an ecosystem. They capture and store energy and also produce nutrient by decompose the organic matter. A diverse ecosystem can withstand environmental stress.
c) **Economic importance:** Biodiversity is a reservoir of various resources. It provides food, medicine, raw material for industries. Various cosmetic products and pharmaceuticals are manufacture by using biodiversity. Not only this, national parks and sanctuaries are the source of tourism.
d) **Medicinal uses:** There are various types of diseases found around us by various microbes. Various types of medicinal plants and animal products are used to cure such diseases. The materials used are the forms of biodiversity.
e) **Ethical importance:** All organisms have a right to exist. Humans should not cause their voluntary extinction. Biodiversity preserves different cultures and spiritual heritage. Therefore, it is very important to conserve biodiversity.

Taxonomy:

It is a branch of biology which deals with identification, nomenclature, classification and description of living organisms.

The word 'taxonomy' is derived from two Greek words taxis and nomos where taxis means arrangement and nomos means on name or rules.

Nomenclature:

It is defined as the system of giving the proper name to the organism. There are two major system of nomenclature.

1. **Common naming system:** The system of nomenclature where organisms are known by different common words in different part of the world. The common names differ in different parts and quite confusing. It is not based on any scientific methodology.
2. **Scientific naming system (Binomial nomenclature):** It is the system of giving name of any organism by scientific methods. In this system, two Latin words are given for any particular organism.

   The credit of giving binomial nomenclature goes to Swedish naturalist, Carolus Linnaeus. Hence, he is known as ‘Father of Binomial Nomenclature’.

Rules of Binomial Nomenclature:

1. Each living organism has a single scientific name in two words i.e. generic name and specific name (epithet).
2. The names are always taken from either Latin or Greek languages.
3. Generic name begins with capital letter followed by small letters and specific name in small letters.
4. Generic name is single word but species name may be single or compound word.
5. Scientific name of the organism should not repeat.
6. Scientific name of organism is underlined in hand written form and italics in printed form.

Advantages of Binomial Nomenclature:

1. There is no confusion on recognizing the organism as there is only one name for a species.
2. It is universally accepted.
3. There is no possibility of changing the scientific name of organism without any scientific evidences.
4. Scientific name provides the detailed characteristics of organisms.
5. The name of organism can be easily revised with scientific evidences.
6. Unknown organism can be easily identified.
7. It helps to develop the phylogenetic and evolutionary trend in organisms.
8. A newly discovered organism can be easily provided with a new scientific name.

Classification:

It is the system or arrangement of organisms into different levels of categories in a sequential manner on the basis of their origin, relationship and structural similarities.

On the basis of characteristics studied, there are different types of classification. They are

1. **Artificial classification system:** It is a classification system where organisms are grouped by choosing only one or more simple superficial characteristics. The characters are selected randomly for the classification.
2. **Natural classification system:** It is the classification system where organisms are grouped on all available similar and dissimilar characteristics. Here the characteristics are well studied and select for the classification.
3. **Phylogenetic classification system:** It is the natural classification system where ascendant and descendant are also discussed.

4. **Modern classification system:** It is the classification where Linnaeus classification terms are replaced by new terms.

On the basis of kingdom, the living organisms are broadly categorize under two headings. They are

1. **Two kingdom classification:** It is the classification system, where all the organisms are grouped under two headings. They are plantae and animalia. This classification system was first proposed by Carolus Linnaeus. It is based on simple superficial characteristics. It is simple and easiest type of classification. It is commonly used in field survey and study.
2. **Five kingdom classification:** It is the classification system, where all the organisms are grouped under five headings. They are monera, protista, mycota, plantae and animalia. This classification system was first proposed by Robert Harding Whittaker to solve the problem arise in two kingdom classification. It is based on cell structure, complexity of body structure, mode of nutrition and evolutionary trend. It is commonly used in theory rather than practical.

   Advantages of five kingdom classification

   a) It is better and more natural than two kingdom classification.
   b) It places the unicellular and multicellular organisms separately.
   c) It places the autotrophs and heterotrophs separately.
   d) It places the fungi in the separate group as it has a different mode of nutrition.
   e) It places the prokaryotes in a separate group.

   Disadvantages of five kingdom classification

   a) It puts unicellular algae in kingdom Protista but multicellular algae in kingdom Plantae.
   b) The organisms showing similarities are placed quite apart.
   c) Many organisms with dissimilarities have been put together in kingdom Protista.
   d) Viruses are entirely excluded from the five kingdom classification system.

Taxonomic hierarchy:

The arrangement of taxonomic groups in definite order, from higher to lower categories, depending upon their relative dimensions is known as taxonomic hierarchy.

Species: It is the smallest rank of classification. The first letter of the species is denoted with small letter. It is written by underlined and printed in italics.

Genus: A group of species having some common character is known as genus. The first letter of genus is denoted with capital letter. It is written by underlined and printed in italics.

Family: A group of genus is known as family. Its suffix is …….aceae.
Order: A group of family is known as order. Its suffix is ……ales.
Class: A group of order is known as class. Its suffix is ……..ae.
Division: A group of class is known as division. Its suffix is ……phyta.
Kingdom: A group of division is known as kingdom. It is the highest categories of classification.