TEACHERS FORUM ®

QUESTION BANK

(solved)

Class XI

BIOLOGY

SUBJECT EXPERTS

CONTENTS

1 THE LIVING WORLD

NCERT SOLUTIONS

1. Why are living organisms classified?

Ans. Classification helps in systematic study of the living beings. Systematic study of living beings not only helps the scientists but also the common people because new scientific discoveries finally benefit the humankind.

2. Why are the classification systems changing every now and then?

Ans. Any scientific theory evolves over a period of time. When a new theory disproves an existing theory, it takes the place of the existing theory. Classification system has also evolved through various stages. When scientists could identify some new attributes; they incorporated in the classification system and thus system could be changed.

3. What different criteria would you choose to classify people that you meet often?

Ans. We can classify people on the basis of their education, profession, hobbies, native place, gender, etc.

4. What do we learn from identification of individuals and populations?

Ans. Through identification of individuals and populations; we can learn about the native place, mother tongue, costumes, food habit, religion, caste, etc.

5. Given below is the scientific name of Mango. Identify the correctly written name.

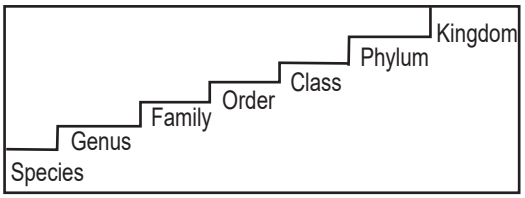
   • Mangifera Indica

   • Mangifera indica

Ans. Mangifera indica

6. Define a taxon. Give some examples of taxa at different hierarchical levels.

Ans. A particular level of hierarchy in the classification of living beings is called a taxon. Following is the representation of taxa at different levels:



7. Can you specify the correct sequence of taxonomic categories?

   (a) Species, Order, Phylum, Kingdom

(b) Genus, Species, Order, Kingdom

(c) Species, Genus, Order, Phylum

Ans. (a) and (c) show the correct order.

8. Define the following terms:

(a) Phylum (b) Class (c) Family (d) Order (e) Genus

Ans. (a) A group of closely related classes is called phylum. In the Plant Kingdom the term phylum has been replaced with division. For example; pisces, amphibia, reptilia, aves and mammalia belong to the Phylum Chordata.

(b) The group of closely related orders is called class. For example; orders Primata and Carnivora belong to the class Mammalia.

(c) A group of closely related genera is called a family. For example; potato and chili belong the family Solanaceae. Similarly, the genus Panthera and the genus Felis belong to the family Felidae.

(d) A group of closely related families is called order. For example; Convolvulaceae and Solanaceae are plant families which belong to the order Polymoniales. Similarly, Felidae and Concidae belong the order Carnivora.

(e) A group of closely related species is called genus. Example; Lion (Panthera leo), leopard (Panthera pardus) and tiger (Panthera tigris) are members of the genus Panthera. Similarly, potato, tomato and brinjal belong to the genus Solanum.

9. How is a key helpful in the identification and classification of an organism?

Ans. A pair of two contrasting characters is called key. While identifying a particular species or any other taxon; we need to select one of the characters and reject another. For example; presence or absence of notochord indicates if the animal belongs to chordata or not.

10. Illustrate the taxonomical hierarchy with suitable examples of a plant and an animal.

Ans. **Classification of Human**

- Phylum : Chordata
- Class : Mammalia
- Order : Primata
- Family : Hominidae
- Genus : Homo
- Species : Homo sapiens

Classification of Mango

- Phylum : Angiosperm
- Class : Dicotyledons

- Order : Sapindales
- Family : Anacardiaceae
- Genus : Mangifera
- Species : Mangifera indica

Additional Questions and Answers

1. Name the three fields of systematics.

Ans. Nomenclature, classification and taxonomy.

2. Give the two name system of organisms?

Ans. Binomial Nomenclature.

3. Write the correct order of sequence of taxonomical categories?

Ans. Species → genus → family → order → class → Phylum → kingdom.

4. Give the unit of classification?

Ans. Rank / category

5. Who gave binomial name of classification?

Ans. Carolus Linnaeus

6. What is meant by identification of a species?

Ans. The identification is aimed at finding correct name and proper position of a species in established scheme of classification.

7. Name the highest categories of classification?

Ans. Kingdom.

8. What are the three codes of nomenclatures?

Ans. International code of botanical, zoological and bacteriological nomenclature.

9. What do you mean by “chemotaxonomy”?

Ans. Understanding taxonomic relationships based on the distribution of certain characteristic chemical constituents is called chemotaxonomy.

10. What are the advantages of giving scientific names of the organisms?

Ans. Scientific names are universally accepted in the world because they are based on same principles that are universal.

11. Give the role of botanical gardens?

Ans. i) Botanical gardens provide plant materials for taxonomic studies.

ii) Plant species are grown for identification.

iii) Plants are grown for research.

iv) To maintain records of local flora.

12. Why are classification systems changing every now and then?

Ans. The organisms are classified on the basis of characteristics. Earliest classification were based on the uses of various organisms but now the humans are interested in knowing more about different kinds of organisms and their diversities and their relationship also.

13. Describe the role of museum in studying systematic?

Ans. i) Museums have collections of plants and animals

ii) These are used to deposit type specimens.

iii) Important centres for taxonomic studies.

iv) Provide information about local flora and fauna as well as of other areas.

14. "Botanical gardens are living herbaria". Comment ?

Ans. Botanical gardens are repositories of information useful for taxonomic studies. Herbaria are most permanent records of plant specimens. Living plants are maintained in botanical gardens. They play key roles in conservation, research, ecology, library and herbaria etc.

15. Why are living organisms classified?

Ans. There are various kinds of life that differ in shape, size and colour etc. The biological diversity is the range of life occurring in biological world. The diversity develops due to the evolution and development of adaptations to overcome competitions among life forms due to limited resources.

16. What is Taxonomic key? How is it helpful in the identification and classification of an organism?

Ans. Key is a taxonomic aid for identification of unknown organisms based on similarities and dissimilarities. It is a taxonomic literature based on couplet. These are analytical in nature and separate keys are needed for every taxonomic category eg. genus, order, family etc and species for identification of organisms.

17. What is a taxon? Illustrate the taxonomical hierarchy with a suitable example?

Ans. Taxon is "a unit of classification of organisms which can be recognized and assigned a definite category at any level of classification" eg. order primates and carnivores are included in mammala. Various classes eg. Pisces, animals, reptilia aves and mammalia form phylum- chordata. All phyla are included in kingdom animalia .

18. Differentiate between species and taxon?

Ans.

SPECIES	TAXON
i) It is the basic taxonomic category	i) It is a level of taxonomic category
ii) It is a rank	ii) It is a group of concrete biological aspects
iii) It is monophylectic	iii) It may be mono or polyphylectic.

19. Differentiate between taxonomy and systematic.

Ans.

TAXONOMY	SYSTEMATICS
i) The science of identification, nomenclature and classification is called taxonomy.	i) It refers to the science of identification description, nomenclature and classification.
ii) It deals with the rules and the principles of classification.	ii) It deals with unique characteristics at every level of classification.

20. Name the guidelines for naming of organisms?

Ans. i) A scientific name generally has two words in Latin or derived from latin irrespective of their origin.

ii) First word denotes the genus whereas second word for species.

iii) Names are printed in italics or are separately underlined to indicate the Latin origin.

iv) Each taxonomic group has only one correct name.

v) The name must be short, precise and easy to pronounce.

vi) Generic name begins with a capital letter and the specific name with small letter eg. Homo sapiens.

vii) The name of author is written in abbreviated form after species name and it is printed in Roman.

21. What is Biological classification? What is the need of classification?

Ans. Biological classification is the naming of organisms by two words.

One is generic name and other is specific name. For eg. Man is called Home sapiens

Classification becomes essential for the following reasons :-

(i) It is very essential for the systematic study of living beings.

(ii) It is impossible to study each and every organism.

(iii) All the types of organisms do not occur in a given locality.

(iv) Without a proper system of classification, it is impossible to recognize or identify different types of organism.

(v) Classification helps in knowing the relationships among different groups of animals and plants.

(vi) Classification makes the study of organisms easier andgives a comparative account of them.

22. What is Binomial system of nomenclature? Who proposed this system? Why is binomial nomenclature the most acceptable mode of naming organism?

Ans. Naming of plants and animals with two words one generic and other specific name is called binomial system of nomenclature.

Carolus Linnaeus introduced this scientific system to name a species. He gave two names to a species eg. Mangifere is generic name and indica is the specific name.

Binomial nomenclature is universally accepted all over the world because it is written according to universal rules of nomenclature framed by ICBN, ICZN, and ICNPC etc. It has two parts generic name and specific name followed by name of scientist who discovered it at last in abbreviated form. It must be in Latin or derived from Latin. It must be binomial. The genus starts with capital letter while species by small letter. Handwritten name is underlined and it indicates relationship with other species present in same genus.

23. State any five objectives of classification.

Ans. Objectives of classification:-

i) Development of a system for easily identifying a species if known or unknown

ii) The description of various species.

iii) Recognition of different species.

iv) To bring circulated characteristics at various levels in hierarchy.

v) The grouping of species in taxonomic classification.

vi) To establish natural relationship board on phylogeny on the basis of resemblances of the organisms.

24. Explain the utility of systematic and mention the characterstics of new.

Ans. Systematics is defined as “the study of classification of organisms based on evolutionary relationships”.

i) It provides useful information about organism, its evolution and adaptation name and classification etc.

ii) Systematics helps us in the identification of useful and harmful animals or plants in applied field of biology.

iii) It plays economical role.

New systematics has the following features:-

a) Species are regarded as dynamic unit and not as static unit of classical systematic.

b) The importance of species as such is reduced since most of the work is done with sub-divisions of species.

c) The morphological species definition has been replaced by a biological one which takes ecology, genetics, geography, cytology and behaviour into consideration.

25. What are the major divisions of classification, classify man.

Ans. i) Kingdom:- It is the highest category of classification. There are 2 kingdom – Animal and plant kingdom.

ii) Phylum:- A group of closely related classes having certain common characters.

iii) Class:- A group of closely related orders having certain common characters.

iv) Order:- A group of closely related families having certain common characters.

v) Family:- A group of closely related genera having certain common characters.

vi) Genus:- A group of closely related species having certain common characters.

vii) Species:- Individuals having certain common characters.

Classification of man:-

Kingdom	Animalia
Phylum	Chordate
Class	Mammalia
Order	Primates
Family	Hominidae
Genus	Homo
Species	Sapiens

26. What are taxonomic aids? Mention some of the taxonomic aids for identification

Ans. Taxonomic aids are devices used to study, Identification and classify organism

Some of these are:-

i) Herbarium :- collections of present /preserved or mounted plant specimens. arranged systematically to provide information on sheets

ii) Botanical gardens :- specialized gardens for collection of living plants, it is maintained for references and identification purposes in which each plant is labelled showing its biological name.

iii) Zoological parks:- places with live animals are called zoos or zoological parks. The animal live in their natural habitat. There are separate places for birds, tigers, lions, reptiles etc.

iv) Museums :- These are mostly set up in institutions where collection of preserved plants and animals for reference and taxonomic studies are placed in preservatives

27. How would you set up a herbarium?

Ans. Setting up of a herbarium involves the following steps:-

i) Visit to a specific area to get intact part of plant, seeds or flowers.

ii) Information about habitat, season and time of collection as well topography etc.

iii) For collection, some tools are needed, like notebook, digger, scissor, knife polyethene, newspaper etc.

iv) Spreading of specimens and drying, change the paper sheets after 3-4 days, plant press may be used for it. The dried specimens are pasted on herbarium sheets.

v) Put label on specimen and mention its place of collection, time of collection, common name scientific name etc.

28. Differentiate between classical taxonomy and Modern taxonomy.

Ans.

CLASSICAL TAXONOMY	MODERN TAXONOMY
i) It is called old taxonomy or systematic	i) It is called Neo- systematic or Bio-systematic.
ii) The species was considered a basic, concreteand separate unit that was fixed or static entity.	ii) The species is considered related to one another, mutable as well as dynamic and ever- changing.
iii) In it, classification was based on the morphological features only	iii) In it, classification was based on phylogenetic relationships of the organisms
iv) Few individuals were studied.	iv) large number of individuals are studied
v) The species was delimited on morphological characters.	v) Emphasis in population instead of species. Morphological delimitation was replaced by biological delimitation.

ENTRANCE CORNER

1. Which one of the following scientist's name is correctly matched with the theory put forth by him? **(2008)**

   (a) Weismann - Theory of continuity of germplasm

   (b) Pasteur - Inheritance of acquired characters

   (c) De Vries - Natural selection

   (d) Mendel - Theory of pangenesis

2. The living organisms can be un-exceptionally distinguished from the non-living things on the basis of their ability for **(2007)**

   (a) responsiveness to touch

   (b) interaction with the environment and progressive evolution

   (c) reproduction

(d) growth and movement

3. Praying mantis is a good example of **(2006)**

(a) warning colouration (b) social insects

(c) camouflage (d) mullerian mimicry

4. Carbohydrates the most abundant biomolecles on earth, are produced by **(2005)**

(a) all bacteria, fungi and algae

(b) fungi, algae and green plant cells.

(c) some bacteria , algae green plant cells

(d) viruses, fungi and bacteria

5. More than 70% of world's fresh water is contained in **(2005)**

(a) Antarctica (b) greenland

(c) glaciers and mountains (d) polar ice

6. Which one of the following is catergorised under living fossils? **(2003,04)**

(a) Selaginella (b) Pinus (c) Cycas (d) Metasequoia

7. Reason of diversity in living being is **(2001)**

(a) mutation (b) gradual change

(c) long term evolutionary change (d) Short term evolutionary change

8. Most abundant organic compound on earth is **(2005)**

(a) protein (b) cellulose (c) lipids (d) steroids

9. The most important feature of all living systems is to **(2000)**

(a) utlilise oxygen to generate energy

(b) replicate the genetic information

(c) produce gamete

(d) utilise solar energy for metabolic activities

10. Warn ocean surge of the Peru Current recurring every 5-8 year or so, in the East Pacific of South America is widely known as **(2000)**

(a) Gulf Stream (b) El Nino (c) Aye Aye (d) Magnox

11. Which one of the following is a living fossil? **(2000)**

(a) Pinus longifolia (b) Dalbergia sissoo

(c) Mirabilis jalapa (d) Ginkgo biloba

12. Pedology is science of **(1991)**

(a) earth (b) soil (c) diseases (d) pollution

13. Phenomenon when organisms resembling others for escaping from enemies is **(1988)**

(a) adaptation (b) mimicry (c) homology (d) analogy

ANSWERS

1. (a)	2. (c)	3. (b)	4. (c)	5. (d)
6. (c)	7.(c)	8. (b)	9. (b)	10. (b)
11. (d)	12. (b)	13. (b)		

✧✧✧✧✧