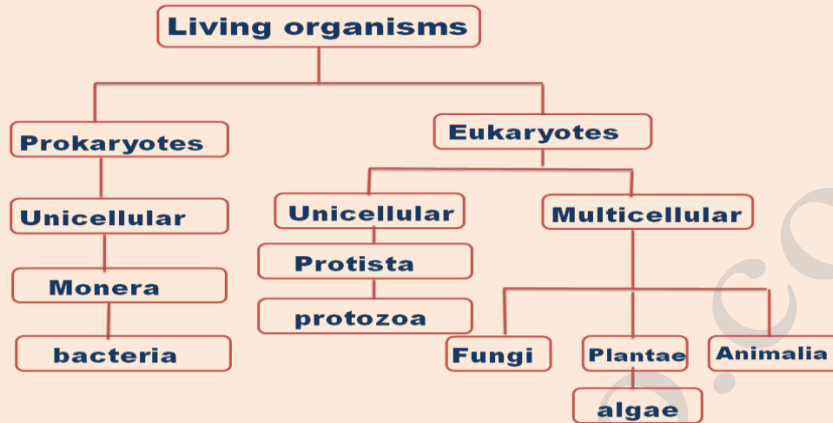


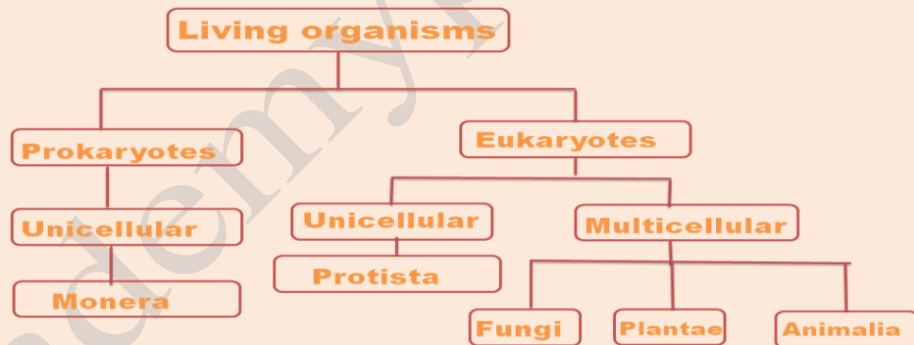
SSC Board: Std 8: Ch 1. Living World & Classification of Microbes Q Bank - Answers

Exercises

1. Use Whittaker's method to classify bacteria, protozoa, fungi, algae, prokaryotic and eukaryotic microbes.



2. Complete the five kingdom method of classification using- living organism, prokaryotes, eukaryotes, multicellular, unicellular, protista, animals, plants, fungi.



3. Find out my partner

A

- Fungi
- Protozoa
- Virus
- Algae
- Bacteria

B

- Chlorella
- Bacteriophage
- Candida
- Amoeba
- Prokaryotic

Ans: Fungi – Candida, Protozoa – Amoeba, Virus – Bacteriophage,
Algae – Chlorella, Bacteria - Prokaryotic

4. State whether the following statements are true or false.

Explain your statement.

a. Lactobacilli are harmful bacteria.

False. Lactobacilli are found in dairy products and the guts of humans and animals.

b. Cell wall of fungi is made up of chitin.

True

c. Organ of locomotion in amoeba is pseudopodia.

True

d. Tomato wilt is a viral disease.

True

5. Give answers.

a. State the merits of Whittaker's method of classification.

Merits of Whittaker's method of classification are:

- i) Prokaryotes have a separate place as kingdom Monera.
- ii) Unicellular and multi-cellular organisms are kept separately.
- iii) Fungi are kept in separate kingdom as their mode of nutrition is different.
- iv) Autotrophs and heterotrophs are placed in separate groups.
- v) Five kingdom classification is better than two kingdom classification.

b. Write the characteristics of viruses.

The characteristics of viruses are:

1. Viruses are extremely minute i.e. they are 10 to 100 times smaller than bacteria and can be seen only with electron microscope.
2. They are found in the form of independent particles . Virus is a long molecule of DNA (Deoxyribo Nucleic Acid) or RNA (Ribo Nucleic Acid) covered by a protein coat.
3. Viruses survive only in living plant or animal cells and produce their own proteins with help of host cell and create their numerous replica. Then they destroy the host cell and become free. These free viruses again infect new cells.
4. Viruses cause many diseases to plants and animals.

c. Explain the nutrition in fungi.

Fungii are saprotrophic, so they absorb their food from decaying organic matter.

d. Which living organisms are included in the kingdom monera?

1. All the organisms that are unicellular.
2. They may be autotrophic or heterotrophic.
3. These are prokaryotic cells without distinct nucleus or cell organelles
4. All type of bacteria and blue green algae are included in the kingdom Monera.

6. Who am I ?

a. I don't have true nucleus, cell organelles or plasma membrane.

Monera

b. I have nucleus and membrane bound cell organelles.

Protozoa

c. I live on decaying organic matter.

Fungi

d. I reproduce mainly by cell division.

Bacteria

e. I can produce my replica.

Virus

f. I am green, but don't have organs.

Algae

7. Draw neat and labelled diagrams.

- Different types of bacteria.
- Paramecium
- Bacteriophage.

8. Arrange the following in ascending order of size Bacteria, Fungi, Viruses, Algae.

Viruses, Bacteria, Fungi, Algae

Project :

- Prepare a chart showing infectious bacteria and the diseases caused by them.

A. Infectious Diseases: Diseases spread through contaminated air, water, food or vectors (insects and other animals) are called as infectious diseases.

Name of disease	Pathogen	Mode of infection	Symptoms	Prevention and treatment
Tuberculosis	<i>Mycobacterium tuberculosis</i>	Spitting by patient, through air, prolonged contact with and sharing of materials of patient	Chronic cough, bloody spitting, emaciation, difficult breathing	BCG vaccine, isolation of patient, regular medication like DOT
Hepatitis (Jaundice)	Hepatitis virus- A, B, C, D, E	Contaminated water, sharing of needles, blood transfusion	Anorexia, yellow urine, general weakness, nausea, vomiting, grey stool	Drinking boiled water, proper cleaning of hands
Dysentery	<i>Bacteria, virus, Shigella, bacilli, Entamoeba histolytica</i>	Contaminated food and water	Watery stool, pains in abdomen	Drinking of boiled water, proper storage of food, ORS consumption
Cholera	<i>Vibrio cholerae</i> (bacterium)	Contaminated food and water	Vomiting, severe diarrhea, cramps in legs	Following hygienic practices, avoiding open place food, drinking boiled water, vaccination against cholera
Typhoid	<i>Salmonella typhi</i> (bacterium)	Contaminated food and water	Anorexia, headache, rash on abdomen, dysentery, fever up to 104 °F.	Drinking clean water, vaccination, proper disposal of sewage

- Visit a nearby pathology lab. Get the information about pathogenic microbes, methods to observe them, different microscopes from the technicians there.

Can you recall?

1. What is the hierarchy for classification of living organisms?

Different scientists have used different criteria and independently classified plants and animals. A hierarchy is formed in the classification that starts with Kingdom Animalia or Kingdom Plantae; further groups and sub-groups are formed depending upon basic similarities and differences. This is called the 'hierarchy of classification'.

2. Who invented 'binomial system' of nomenclature?

Carl Linnaeus invented the 'binomial system' of nomenclature/

3. Which levels of hierarchy are considered while writing the name in binomial nomenclature?

Binomial nomenclature consists of two parts – the first part is 'genus' and second, 'species'

4. Use your brain power: Explain merits and demerits of Whittaker's classification.

Merits:

- i) Prokaryotes have a separate place as kingdom Monera.
- ii) Unicellular and multi-cellular organisms are kept separately.
- iii) Fungi are kept in separate kingdom as their mode of nutrition is different.
- iv) Autotrophs and heterotrophs are placed in separate groups.
- v) Five kingdom classification is better than two kingdom classification.

Demerits:

- i) Unicellular algae are kept in kingdom Protista, but multicellular algae are kept in kingdom Plantae.
- ii) There is improper grouping of kingdom Protista as diverse organisms have been included.
- iii) Viruses have not been given a proper place in the five kingdom classification.
- iv) Slime moulds have been included in kingdom Protista, even though they are different from the rest of the organisms that are part of Protista.
- v) Some organisms under kingdom Protista are not Eukaryotic.

Fill in the blanks:

1. According to 2011 census, around 87 million species of living organisms are found on the earth- including land and sea.
2. The process of dividing living organism into groups and subgroups is called Biological classification.
3. Carl Linnaeus in 1735 divided living world in 2 kingdoms - Vegetabilia and Animalia.
4. Haeckel in 1866 considered 3 kingdoms- Protista, Plants and Animals.
5. In 1925 - Chatton created two groups Prokaryotes and Eukaryotes.
6. In 1938 Kopland divided living organisms into 4 kingdoms Monera, Protista, Plants and Animals.
7. Robert Harding Whittaker, an American Ecologist, in 1969 he divided living organisms into 5 groups.
8. Moving, small rod-like microbes are lactobacilli bacteria.
9. All type of bacteria and blue green algae are included in the kingdom Monera.
10. National Institute of Virology, Pune is involved in research on viruses
11. Among the living organisms, microorganisms are largest in number.
12. With reference to size of microbes, 1 meter = 10⁶ micrometer (mm) 1 meter = 10⁹ nanometer (nm)

Answer the following questions

1. Why is classification of living organisms important?

There are about 87 million species of living organisms found on the earth- including land and sea. To study such a vast number, it was essential to divide them into groups. Therefore classification of living organism is important.

2. What is Biological classification?

The process of dividing living organism into groups and subgroups is called Biological classification.

3. Explain Whittaker's classification.

For this classification Whittaker considered following criteria

1. Complexity of cell structure : Prokaryotic and Eukaryotic.
2. Complexity of organisms : Unicellular or Multicellular.
3. Mode of nutrition : Plants - Autotrophic Photosynthetic Fungi- Saprophytic- Absorption from dead organisms. Animals- Heterotrophic and ingestive.
4. Life style : Plants - Producers Animals - Consumers Fungi - Decomposers
5. Phylogenetic relationship : Prokaryotic to Eukaryotic, unicellular to multicellular.

4. Give the characteristics of the following:

a. Monera

All type of bacteria and blue green algae are included in the kingdom Monera.

Characteristics :

- (1) All the organisms are unicellular.
- (2) They may be autotrophic or heterotrophic.
- (3) These are prokaryotic cells without distinct nucleus or cell organelles

b. Protista

Characteristic :

- (1) Protista are single celled organisms with well defined nucleus enclosed in a nuclear membrane.
- (2) They have pseudopodia or hair like cilia or whip like flagella for locomotion.
- (3) Autotrophs- eg. Euglena, Volvox contain chloroplast. Heterotrophs- eg. Amoeba, Paramecium

c. Fungi

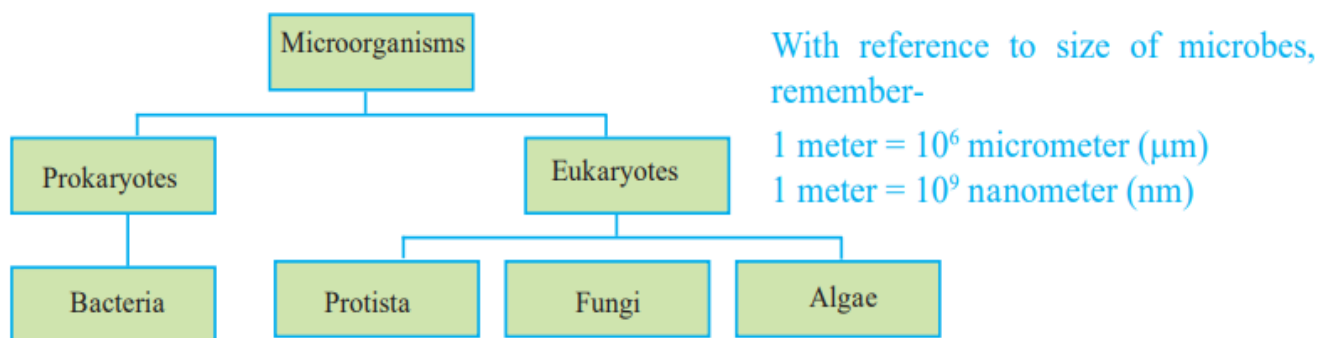
Characteristics :

- (1) These are non-green, eukaryotic, heterotrophic organisms.
- (2) Most of them are saprotrophs. They feed upon decaying organic matter.
- (3) Their cell wall is made up of tough and complex sugar called 'Chitin'.
- (4) Some fungi are thread like and many nuclei are present in the cytoplasm.
- (5) Examples- Baker's yeast, Aspergillus (Fungus on corn), Penicillium, Mushrooms.

5. How are micro-organisms classified? List the characteristics of each type.

Classification of Microbes

Among the living organisms, microorganisms are largest in number. Hence they are classified as follows.



1.6 Classification of Microorganisms

1. Bacteria (size – 1 mm to 10 mm)

1. Unicellular, independent / parasitic organisms. Sometimes many bacteria together form colonies.
2. Bacterial cell is prokaryotic with cell wall, but distinct nucleus or cell organelles are absent.
3. They reproduce by simple binary fission.
4. In favourable conditions, bacteria grow vigorously and can double their number in 20 minutes.

2. Protozoa (size - approximately 200 mm)

1. Protozoans are found in soil, fresh water and sea water. Some are found in the body of other organisms and are pathogenic.
2. These are unicellular organisms with eukaryotic cell.
3. There is great variation in cell structure, organs of locomotion and modes of nutrition among protozoans.
4. These organisms reproduce by simple cell division. Eg.- Amoeba, Paramecium - Free living in dirty water. Entamoeba histolytica - causes amoebiasis. Plasmodium vivax- causes malaria Euglena – autotrophic

3. Fungi- (size- approximately 10 mm to 100 mm)

1. These are found on decaying organic matter and dead bodies of plants and animals.
2. These are eukaryotic organisms. Some are unicellular and others are visible with naked eyes.
3. Saprotrophic, absorb their food from decaying organic matter.
4. They reproduce sexually and asexually by cell division or by budding. Eg. Baker's yeast, Candida, Mushroom.

4. Algae- (size- approximately 10 mm to 100 mm)

1. They are aquatic.
2. Eukaryotic, unicellular, autotrophic organisms.
3. Photosynthesis is carried out with the help of chloroplast present in the cell. Eg. Chlorella, Chlamydomonas very few species of algae are unicellular. Most of them are multicellular and visible with naked eyes.

5. Viruses- (size- approximately 10 nm to 100 nm) Generally, viruses are not considered as living organisms or they are said to be “Organisms at the edge of living and nonliving.” They are studied under microbiology.

1. Viruses are extremely minute i.e. they are 10 to 100 times smaller than bacteria and can be seen only with electron microscope.
2. They are found in the form of independent particles . Virus is a long molecule of DNA (Deoxyribo Nucleic Acid) or RNA (Ribo Nucleic Acid) covered by a protein coat.
3. Viruses survive only in living plant or animal cells and produce their own proteins with help of host cell and create their numerous replica. Then they destroy the host cell and become free. These free viruses again infect new cells.
4. Viruses cause many diseases to plants and animals.