# Microorganisms

## Very Short Q&A:

**Q1: Microorganisms are too small that they can be seen with the help of _____.**

**Ans:** microscope

**Q2: Microorganisms are classified into four major groups. Name them.**

**Ans:** bacteria, fungi, protozoa and some algae.

**Q3: Define virus**

**Ans:** Viruses are microscopic infectious agent that acts as non-living outside host cell and inside host cell becomes living and show reproduction. It can affect all kind of organism including animals, plants and bacteria.

**Q4: Name some diseases caused by protozoa.**

**Ans:** Dysentery and malaria

**Q5: Name some diseases caused by bacteria.**

**Ans:** Typhoid and tuberculosis.

**Q6: Bacteria are of spiral shape as well as _____.**

**Ans:** rod- shaped

**Q7: Name some viral diseases.**

**Ans:** Common cold, influenza(flu) and coughs

**Q8: Give example of single cellular and multicellular microorganisms.**

**Ans:** Single cellular: bacteria, protozoa and some algae like Chlamydomonas Multicellular organisms: fungi and algae like Phaeophyceae or brown algae

**Q9: Name some friendly microorganisms.**

**Ans:** Some friendly microorganisms: Lactobacillus bacteria, Rhizobium bacteria and yeast like : Saccharomyces cerevisiae

**Q10: Name some harmful microorganisms.**

**Ans:** Some harmful microorganisms: varicella zoster virus Xd, Mycobacterium tuberculosisetc

**Q11: Alcohol is produced with the help of _____.**

**Ans:** fermentation.

**Q12: Tick the correct answer**
**Which of the following is an antibiotic?**

- **Penicillin**
- **Alcohol**
- **Nitrate**
- **None of these**

**Ans:** Penicillin

**Q13: Define fermentation.**

**Ans:** Fermentation is the process of food processing in which sugar is converted into alcohol by the action of microorganisms. This process is used to produce alcoholic beverages such as wine, beer, and cider.

**Q14: Define antibiotics.**

**Ans:** Antibioticsare types of medications that destroy or slow down the growth of disease- causing microorganism. The source of these medicines is microorganism.

**Q15: What do you understand by antibodies?**

**Ans:** An antibody is a protein produced by the body's immune systemin response to the disease carrying microbe entering our body. Antibody fights against the disease causing microbe and protect our body from infectious diseases.

**Q16: Several diseases like tuberculosis, smallpox and hepatitis can be prevented by _____.**

**Ans:** Vaccination

**Q17: Name some biological nitrogen fixers.**

**Ans:** Some bacteria and blue green algae.

**Q18: Define pathogens.**

**Ans:** Disease causing microorganisms are called pathogens.

**Q19: What do you mean by communicable diseases?**

**Ans:** There are some microbial diseases that can spread from an infected person to a healthy person through air, water, food or physical contact. Such kind of diseases is called communicable disease.

**Q20: Name some communicable diseases.**

**Ans:** Cholera, common cold, chicken pox, tuberculosis.

**Q21: Name some organisms which act as carriers of disease causing microbes.**

**Ans:** Female Anopheles mosquito which carries parasites of malaria, female Aedes mosquito acts as carrier of dengue virus.

**Q22: Female Anopheles mosquito carries the parasite of _____.**

**Ans:** Malaria

**Q23: Female_____ mosquito acts as carrier of dengue virus.**

**Ans:** Aedes

**Q24: Why we should not let water collect anywhere in our neighbourhood?**

**Ans:** Because all mosquitoes breed in water

**Q25: Name some microorganisms that cause disease in animals.**

**Ans:** Foot and mouth disease of cattle caused by virus and anthrax disease of human and cattle caused by bacterium.

**Q26: Name some microorganisms that cause disease in plants.**

**Ans:** 2

**Q27: Why a person suffers from food poisoning?**

**Ans:** If a person consumes food spoiled by some microorganisms, then he suffers from food poisoning because of the release of harmful toxic substance by the microorganisms.

**Q28: What are preservatives?**

**Ans:** Preservatives are naturally occurring or synthetically produced substance that are generally used to check the growth of microorganisms. E.g. salt and sugar acts as preservatives in pickles to prevent the growth of microorganisms.Sodium benzoate and sodium metabisulphite are common preservatives.

**Q29: Define pasteurisation.**

**Ans:** Pasteurization is a process of heating a liquid to a specific temperature for a predefined length of time and then immediately cooling it after it is removed from the heat. This process slows spoilage due to microbial growth in the food.Eg: the milk is heated to about 70 °c for 15 to 30 seconds and then suddenly chilled and stored. This process was discovered by Louis Pasteur.

**Q30: Name the bacteria involved in nitrogen fixation and where does it lives?**

**Ans:** Rhizobium bacteria. It lives in root nodules of leguminous plants.

**Q31: Can we see microorganisms with the naked eye? If not, how can we see them?**

**Ans:** We can see microorganisms only with the help of microscope.

**Q32: Alcohol is produced with the help of_____.**

**Ans:** Fermentation.

**Q33: Which of the following is prepared by the action of microorganism?**

- **Manure**
- **Fertilizer**
- **Both of them**
- **None of these**

**Ans:** a. Manure

**Q34: Name the person who discovered fermentation and vaccine for small pox.**

**Ans:** Louis Pasteur discovered fermentation and Edward Jenner discovered vaccine for smallpox.

**Q35: Name some food preservatives.**

**Ans:** Sodium benzoate and sodium metabisulphite are common food preservatives.

---

## Short Q&A:

### Q1: Write short notes on

- **Bacteria**
- **Viruses**

**Ans:**

- Bacteria:Bacteria are single- celled microscopic organisms. They can survive under all types of environment, ranging from ice cold climate to hot springs and deserts to marshy lands. Bacteria always live in colonies. They are of spiral shape or rod shape. Bacteria play important role in our life; some bacteria are useful whereas some other are harmful and cause diseases. Bacteria are involved in making of cheese and pickles. Lactobacillus bacteria promote the formation of curd. Antibiotics are also made from bacteria. Apart from this diseases like tuberculosis and typhoid are caused due to bacteria.
- Viruses:Viruses are microscopic infectious agent that acts as non-living outside host cell and inside host cell becomes living and show reproduction. It can affect all kind of organism including animals, plants and bacteria. Common ailments like cold, coughs and influenza (flu) are caused by viruses; serious diseases like chicken pox and polio are also caused by viruses.

**Q2: Write short notes on**

- **Protozoa**
- **Algae**

**Ans:**

- Protozoa:Protozoa had been defined as unicellularprotists with animal-like behaviour like movement. The largest protozoa known are the deep-sea dwellingxenophyophores, which can grow up to 20 cm in diameter.They move around with whip-like tails called flagella, and hair-like structures called cilia,it is responsible for causing diseases like dysentery and malaria in human beings.
- Algae:Algae are a very large and diverse group of simple, typicallyautotrophic organisms, ranging from unicellular to multicellular forms. Most are photosynthetic like plants, and "simple" because their tissues are not organized into many distinct organs found in land plants. The largest and most complex marine forms are called seaweeds.Algae exhibit a wide range of reproductive strategies, from simple, asexual cell division to complex forms of sexual reproduction.Nearly all algae have photosynthetic machinery ultimately derived from cyanobacteria, and so produce oxygen as a by-product of photosynthesis.\

**Q3: What do you mean by friendly microbes?**

**Ans:** Microorganisms are beneficial to us in various ways; they not only prepare curd, bread, cake, wine and medicines for us but also used to increase soil fertility by fixing atmospheric nitrogen. Thus we called them as friendly.

**Q4: How curd is formed?**

**Ans:** Bacterium lactobacillus multiplies in milk and converts it into curd.

**Q5: Why yeast is used in the baking industry for making bread, cakes and pastries?**

**Ans:** Yeast reproduces rapidly and produces carbon dioxide during respiration. Bubbles of gas fill the dough (mixture of atta or maida and some sugar and water) and increase its volume. This is the basis of using yeast in baking industry.

**Q6: Define the process of fermentation and its application.**

**Ans:** Fermentation is the process of food processing in which sugar is converted into alcohol by the action of microorganisms. This process is used to produce alcoholic beverages such as wine, beer, and cider. For this purpose yeast is grown on natural sugars present in grains like barley, wheat, rice, crushed fruit juices etc.

**Q7: How antibiotics are related to microorganisms.**

**Ans:** Antibiotics are medicines that kill or stop the growth of disease causing microorganisms and they are prepared from microorganisms. For e.g. streptomycin, tetracycline and penicillin are some of the antibiotics prepared from microorganisms like fungi and bacteria.

**Q8: Why vaccines are important?**

**Ans:** Vaccines produces antibody in our body to fight against disease causing microbes entering our body. Diseases like cholera, tuberculosis, smallpox and hepatitis can be prevented by vaccination; polio drop given to children is also a vaccine.

**Q9: What is the main motto of pulse polio program?**

**Ans:** The main motto of pulse polio program is to protect children from polio, by providing them with polio drops.

**Q10: Write short notes on medicinal use of microorganisms.**

**Ans:** Antibiotics are medicines that kill or stop the growth of disease causing microorganisms and they are prepared from microorganisms. For e.g. streptomycin, tetracycline and penicillin are some of the antibiotics prepared from microorganisms like fungi and bacteria.

**Q11: Write short notes on increasing soil fertility by the action of microorganisms.**

**Ans:** Some bacteria and blue green algae are able to fix atmospheric nitrogen into nitrates and nitrates are an important constituent to increase soil fertility. These microbes are generally called biological nitrogen fixers.

**Q12: How do microbes clean our environment?**

**Ans:** Microbes decompose the dead organic wastes of plants and animals converting them into simple substances. These substances are again used by other plants and animals. Thus microbes degrade the harmful and smelly substances and clean up the environment.

**Q13: Why some microorganisms are considered as harmful?**

**Ans:** Some microorganisms cause diseases in human beings, plants and animals, like somespecies of bacteria causes tuberculosis and typhoid, some species of virus causes common cold and influenza. Some microorganisms also cause spoilage of food, clothing and leather items. Thus we consider some microorganisms are harmful.

**Q14: List all possible ways by which pathogens can enter our body.**

**Ans:** Diseases causing microorganisms can enter our body through the air we breathe, water we drink and the food we eat. They can also get transmitted by direct contact through an infected person or

carried through an animal.

**Q15: Define communicable diseases with examples.**

**Ans:** There are some microbial diseases that can spread from an infected person to a healthy person through air, water, food or physical contact. Such kind of diseases is called communicable disease. For e.g. cholera, chicken pox, tuberculosis.

**Q16: Why we should keep a handkerchief on the nose and mouth while sneezing?**

**Ans:** When a person suffering from common cold sneezes, the fine droplets of moisture containing thousands of viruses are spread in the air, these viruses may enter the body of healthy person while breathing, thus we should keep handkerchief on the mouth and nose while sneezing so that viruses may not spread In the air and enter into healthy person's body to make him sick.

**Q17: How does housefly spread diseases?**

**Ans:** Houseflies sit on the garbage and animal excreta where pathogens stick to their bodies and these pathogens get transferred to uncovered food when these flies sit on uncovered food items and the person consuming these food fall sick.

**Q18: Why should we avoid consuming uncovered food items?**

**Ans:** Houseflies sit on the garbage and animal excreta where pathogens stick to their bodies and these pathogens get transferred to uncovered food when these flies sit on uncovered food items and the person consuming these food fall sick.

**Q19: Write short notes on diseases causing microorganisms in animals.**

**Ans:** There are some microorganisms that cause disease in animals also like anthrax is a very dangerous human and cattle disease caused by a bacterium. Foot and mouth disease of cattle is caused by a virus.

**Q20: Write short notes on diseases causing microorganisms in plants.**

**Ans:** There are some microorganisms that cause disease in plants like wheat, sugarcane, rice, potato, orange, and apple. Like citrus canker disease caused by bacteria in plant, rust of wheat disease in wheat plant caused by fungi. These diseases reduce the yield of crops and can be controlled by using certain chemicals that kill microbes.

**Q21: Neha went to a party n she ate a variety of foodstuff there, on reaching home she started vomiting and had stomach ache. What do you think why it is so?**

**Ans:** It is because of food poisoning. Food poisoning could be due to the consumption of food spoilt by some microorganisms.

**Q22: How do we preserve cooked food at home?**

**Ans:** We preserve cooked food at home by using preservatives like salt, sugar and edible oil. Common salt has been used to preserve meat and fish.it is also used to preserve amla, raw mangoes, tamarind, etc. Jams, jellies and squashes are preserved by using sugar. Vegetables, fruits, pickles are often preserved by oil and vinegar.

**Q23: Why a mango gets spoilt and rotten after few days but a mango pickle does not spoil for a long period of time?**

**Ans:** A mango gets spoilt and rotten after few days but a mango pickle does not spoil for a long period of time because mango pickles contains salt which acts as preservatives and prevent the growth of microorganisms in it.

**Q24: What are preservatives and their importance?**

**Ans:** Preservatives are naturally occurring or synthetically produced substance that are generally used to check the growth of microorganisms. E.g. salt and sugar acts as preservatives in pickles to prevent the growth of microorganisms. Sodium benzoate and sodium metabisulphite are common preservatives,

**Q25: What kind of food stuffs can be preserved by using common salt?**

**Ans:** We preserve cooked food at home by using preservatives like salt, sugar and edible oil. Common salt has been used to preserve meat and fish.it is also used to preserve amla, raw mangoes, tamarind, etc. Jams, jellies and squashes are preserved by using sugar. Vegetables, fruits, pickles are often preserved by oil and vinegar.

**Q26: What kind of food stuffs can be preserved by using sugar?**

**Ans:** We preserve cooked food at home by using preservatives like salt, sugar and edible oil. Common salt has been used to preserve meat and fish.it is also used to preserve amla, raw mangoes, tamarind, etc. Jams, jellies and squashes are preserved by using sugar. Vegetables, fruits, pickles are often preserved by oil and vinegar.

**Q27: What kind of food stuffs can be preserved by using oil and vinegar?**

**Ans:** We preserve cooked food at home by using preservatives like salt, sugar and edible oil. Common salt has been used to preserve meat and fish.it is also used to preserve amla, raw mangoes, tamarind, etc. Jams, jellies and squashes are preserved by using sugar. Vegetables, fruits, pickles are often preserved by oil and vinegar.

**Q28: Why milk is boiled before storage or consuming?**

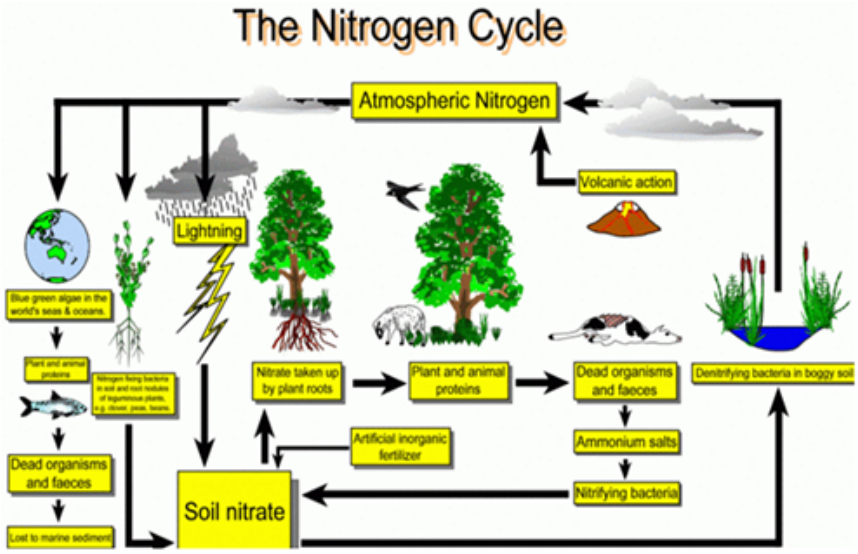
**Ans:** Boiling kills many microorganisms, thus milk is boiled before storing or consuming. Boiling of milk at about 70°c for 15 to 30 second and then suddenly chilling and its storage destroy all of its microorganisms, and prevent further growth of the microorganisms.

**Q29: What are the advantages of sealed air tight packing for storage of food items?**

**Ans:** Sealed air tight packets prevent the attack of microbes and protect the food items inside it from getting spoiled and toxic.

**Q30: What is nitrogen cycle?**

**Ans:** The nitrogen cycle is the process by which nitrogen is converted between its various chemical forms.Nitrogen is present in the environment in a wide variety of chemical forms including organic nitrogen, ammonium ($NH_4^+$), nitrite ($NO_2^-$), nitrate ($NO_3^-$), nitrous oxide ($N_2O$), nitric oxide (NO) or inorganic nitrogen gas ($N_2$), atmospheric nitrogen needs to be processed to be used by plants and animals. Some bacteria and blue green algae present In soil fix atmospheric nitrogen into nitrates which is used by plants from the soil through their root systemnitrogen is then used for synthesis of plant proteins and other compounds,when plants and animals die bacteria and fungi present in soil convert the nitrogenous waste into nitrogen compounds to be used by plants again, some bacteria converts some part of them into nitrogen gas which goes back into the atmosphere, thus percentage of nitrogen in atmosphere remains more or less constant.

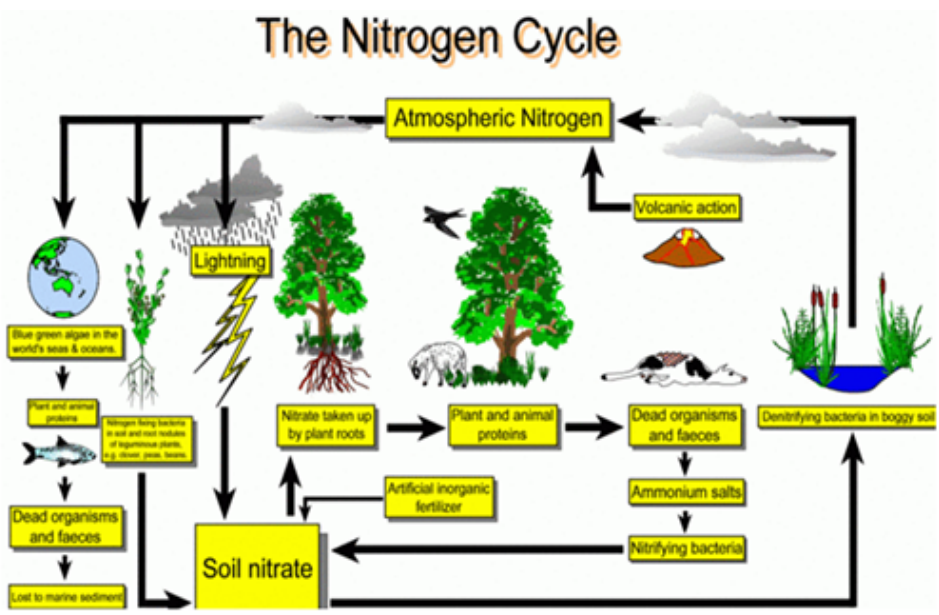



---

## Long Q&A:

**Q1: Explain nitrogen cycle with a diagram.**

**Ans:** The nitrogen cycle is the process by which nitrogen is converted between its various chemical forms.Nitrogen is present in the environment in a wide variety of chemical forms including organic nitrogen, ammonium (NH4+), nitrite (NO2-), nitrate (NO3-), nitrous oxide (N2O), nitric oxide (NO) or inorganic nitrogen gas (N2), atmospheric nitrogen needs to be processed to be used by plants and animals. Some bacteria and blue green algae present In soil fix atmospheric nitrogen into nitrates which is used by plants from the soil through their root systemnitrogen is then used for synthesis of plant proteins and other compounds,when plants and animals die bacteria and fungi present in soil convert the nitrogenous waste into nitrogen compounds to be used by plants again, some bacteria converts some part of them into nitrogen gas which goes back into the atmosphere, thus percentage of nitrogen in atmosphere remains more or less constant.




**Q2: Explain how microbes are useful to us in our day to day life.**

**Ans:** Microorganisms are beneficial to us in various ways; they not only prepare curd, bread, cake, wine and medicines for us but also used to increase soil fertility by fixing atmospheric nitrogen. Thus

we called them as friendly.

Yeast reproduces rapidly and produces carbon dioxide during respiration. Bubbles of gas fill the dough (mixture of atta or maida and some sugar and water) and increase its volume. This is the basis of using yeast in baking industry.

Fermentation is the process of food processing in which sugar is converted into alcohol by the action of microorganisms. This process is used to produce alcoholic beverages such as wine, beer, and cider. For this purpose yeast is grown on natural sugars present in grains like barley, wheat, rice, crushed fruit juices etc.

Antibiotics are medicines that kill or stop the growth of disease causing microorganisms and they are prepared from microorganisms. For e.g. streptomycin, tetracycline and penicillin are some of the antibiotics prepared from microorganisms like fungi and bacteria.

**Q3: Explain how microbes are harmful to us.**

**Ans:** Some microorganisms cause diseases in human beings, plants and animals, like somespecies of bacteria causes tuberculosis and typhoid, some species of virus causes common cold and influenza. Some microorganisms also cause spoilage of food, clothing and leather items. Thus we consider some microorganisms are harmful.

Diseases causing microorganisms can enter our body through the air we breathe, water we drink and the food we eat. They can also get transmitted by direct contact through an infected person or carried through an animal.

There are some microorganisms that cause disease in animals also like anthrax is a very dangerous human and cattle disease caused by a bacterium. Foot and mouth disease of cattle is caused by a virus.

There are some microorganisms that cause disease in plants like wheat, sugarcane, rice, potato, orange, and apple. Like citrus canker disease caused by bacteria in plant, rust of wheat disease in wheat plant caused by fungi. These diseases reduce the yield of crops and can be controlled by using certain chemicals that kill microbes.

It is because of food poisoning. Food poisoning could be due to the consumption of food spoilt by some microorganisms.

**Q4: What are the major precautions one should follow while taking antibiotics?**

**Ans:** Antibiotics should be taken only on the advice of an expert and qualified doctor. One should must complete the course prescribed by the doctor. Taking antibiotics in wrong dose or taking it when it is not needed makes it less effective when it is required in future. Also unnecessarily uptake of antibiotics may kill the useful bacteria inside the body.one should keep in mind that antibiotics are not effective against cold and flu as these are caused by viruses.

**Q5: What are the major group of microorganisms explain each group with their harmful and useful effects in our life**

**Ans:** Microorganisms are broadly divided into four major groups namely: Bacteria, virus, fungi and virus.

Bacteria are single- celled microscopic organisms. They can survive under all types of environment, ranging from ice cold climate to hot springs and deserts to marshy lands. Bacteria always live in colonies. They are of spiral shape or rod shape. Bacteria play important role in our life; some bacteria are useful whereas some other are harmful and cause diseases. Bacteria are involved in making of cheese and pickles. Lactobacillus bacteria promote the formation of curd. Antibiotics are also made from bacteria. Apart from this diseases like tuberculosis and typhoid are caused due to bacteria. Viruses are microscopic infectious agent that acts as non-living outside host cell and inside host cell becomes living and show reproduction. It can affect all kind of organism including animals, plants and

bacteria. Common ailments like cold, coughs and influenza (flu) are caused by viruses; serious diseases like chicken pox and polio are also caused by viruses.

Protozoa had been defined as unicellularprotists with animal-like behaviour like movement. The largest protozoa known are the deep-sea dwellingxenophyophores, which can grow up to 20 cm in diameter.They move around with whip-like tails called flagella, and hair-like structures called cilia,it is responsible for causing diseases like dysentery and malaria in human beings.
Algae are a very large and diverse group of simple, typicallyautotrophic organisms, ranging from unicellular to multicellular forms. Most are photosynthetic like plants, and "simple" because their tissues are not organized into many distinct organs found in land plants. The largest and most complex marine forms are called seaweeds.Algae exhibit a wide range of reproductive strategies, from simple, asexual cell division to complex forms of sexual reproduction.Nearly all algae have photosynthetic machinery ultimately derived from cyanobacteria, and so produce oxygen as a by-product of photosynthesis.