

MICROORGANISMS: FRIEND AND FOE

1. Fill in the blanks.

- a. Microorganisms can be seen with the help of a microscope.
- b. Blue green algae fix nitrogen directly from air to enhance fertility of soil.
- c. Alcohol is produced with the help of yeast.
- d. Cholera is caused by bacteria.

2. Tick the correct answer.

a. Yeast is used in the production of-

Sugar Alcohol✓ Hydrochloric acid Oxygen

b. The following is an antibiotic-

Sodium bicarbonate Streptomycin✓ Alcohol Yeast

c. Carrier of malaria causing protozoan is-

Female *Anopheles* mosquito✓ Cockroach Housefly Butterfly

d. The most common carrier of communicable diseases is-

Ant Housefly✓ Dragonfly Spider

e. The bread or idli dough rises because of-

Heat Grinding Growth of yeast cells✓ Kneading

f. The process of conversion of sugar into alcohol is called-

Nitrogen fixation Moulding Fermentation✓ Infection

3. Match the organisms in Column I with their action in Column II.

Column I

i. Bacteria

ii. *Rhizobium*

iii. *Lactobacillus*

iv. Yeast

v. A protozoan

vi. A Virus

Column II

a. Fixing Nitrogen

b. Setting of curd

c. Baking of bread

d. Causing Malaria

e. Causing Cholera

f. Causing AIDS

g. Producing antibodies

4. Can microorganisms be seen with the naked eye? If not, how can they be seen?

Microorganisms are too small. So they cannot be seen with naked eye. To see the microorganisms like bacteria and protozoa we use a microscope. Fungus that grows on the bread can be seen with a magnifying glass.

5. What are the major groups of microorganisms?

The major groups of microorganisms are:

- a. **Bacteria**- *Lactobacillus* and *Rhizobium*.
- b. **Fungi**- *Penicillium* and *Aspergillus*.
- c. **Protozoa**- *Amoeba* and *Paramecium*.
- d. **Algae**- *Chlamydomonas* and *Spirogyra*.
- e. **Viruses**- HIV AIDS virus.

6. Name the microorganisms which can fix nitrogen in the soil.

Nitrogen is needed by the plants for their growth. They cannot absorb nitrogen directly from the air. There are microorganisms like some bacteria and blue green algae in the soil that take nitrogen from the air and make nitrogenous compounds. Thus they enrich the soil with

nitrogenous compounds and make it fertile. These bacteria and blue green algae are called biological nitrogen fixers.

7. Write ten lines on the usefulness of microorganisms in our lives.

Microorganisms are so small that we cannot see them with naked eyes. Still they are very useful for us.

- a. Lactobacillus is used to form curd from milk.
- b. Rhizobium bacteria present in the roots of pulse plants fix nitrogen from the air and supply nitrogen compounds to the pulse plants.
- c. The antibiotic Penicillin is prepared from the fungus Penicillium. This antibiotic is used to cure many diseases.
- d. Some bacteria and blue green algae in the soil take nitrogen from the air and make nitrogenous compounds. Thus they make the soil fertile.
- e. Bacteria present in the soil decompose the organic matter and release the nutrients in the soil making it fertile. These nutrients are absorbed by the plants.
- f. Yeast is used for the production of alcohol and wine.
- g. Yeast is also used for making bread, pastries and cakes.
- h. Yeast is also used in making of idlis and bhaturas.
- i. Bacteria present in our intestine help in proper digestion and release vitamin B. This vitamin is absorbed by our intestine.
- j. Many vaccines are prepared from microorganisms. These vaccines are given to children to protect them from diseases like tuberculosis, polio etc.

8. Write a short paragraph on the harms caused by the microorganisms.

Microorganisms are harmful in the following ways:

- a. Microorganisms cause diseases like typhoid, cholera and tuberculosis in human beings.
- b. Microorganisms also cause plant diseases like rust of wheat and citrus canker.
- c. Microorganisms like bacteria and fungi cause food poisoning by producing toxic substances in the food.
- d. Microorganisms like bacteria and fungi cause spoilage of the food, paper, leather goods and clothes.
- e. Microorganisms like bacteria and protozoa cause pollution of water and make it unfit for drinking.

9. What are antibiotics? What precautions must be taken while taking antibiotics?

Antibiotics are the medicines (drugs) that kill or stop the growth of disease causing microorganisms in our body. Thus they help in curing the disease. They are produced from bacteria and fungi. Penicillin, Streptomycin, Tetracycline and Erythromycin are some of the antibiotics. While taking antibiotics following precautions must be taken-

- a. Antibiotics should be taken only on the advice of a qualified doctor.
- b. The course prescribed by the doctor should be finished in proper doses.
- c. Antibiotics should not be taken unnecessarily as it may kill the beneficial bacteria in the body.

10. Write a note on viruses.

Viruses are microorganisms. They do not have a cellular structure. They reproduce only inside the cells of other organisms. The viruses cause many diseases like common cold, flu, polio and chicken pox. Antibiotics do not kill the viruses.

11. What is vaccination? How does it help in protecting children from diseases?

The process of introducing weakened disease causing microorganisms in the body is called vaccination.

The body kills the weakened microorganisms by producing antibodies. These antibodies remain in the body and kill the microorganisms if they enter again. In this way vaccination helps in protecting the children from diseases.

12. What are communicable diseases? How are they caused?

Those diseases which spread from an infected person to a healthy person through air, water, food or physical contact are called communicable diseases. These diseases are caused by microorganisms.

13. Explain the role of mosquitoes in spreading the diseases? How can we control them?

Mosquitoes act as carriers of many disease causing microorganisms. *Anopheles* mosquito carries the parasite of malaria. Female *Aedes* mosquito carries the dengue virus from infected to the healthy person.

The spread of diseases can be controlled by killing the mosquitoes. The breeding places of mosquitoes like water in the coolers, tyres, flowerpots etc should be drained out. Mosquito nets should be used at night.

14. What is food poisoning? What is its effect?

Microorganisms like bacteria and fungi grow in the food and produce poisonous (toxic) substances in the food. This is called food poisoning. If such food is eaten it may cause serious illness or even death.

15. How is food preserved from the attack of microorganisms?

Food is preserved from the attack of microorganisms by the following methods:

a. Chemical Method: Food preservatives like Sodium Benzoate are added to pickles, jams and squashes to prevent the growth of microorganisms.

b. Preservation by Common Salt: Meat and fish are preserved by covering with dry salt. Salting is also used to preserve amla, raw mangoes and pickles.

c. Preservation by Sugar: Jams, Jellies and squashes are preserved by sugar. Sweet pickles like murabba are also preserved by using sugar. Sugar prevents the growth of microorganisms.

d. Preservation by Oil and Vinegar: Oil and vinegar are used to prevent growth of microorganisms in pickles. Mustard oil is popularly used for the preservation of pickles.

e. Heat and Cold Treatment: Milk is boiled to kill the bacteria. After it cools down it is stored in a refrigerator. Low temperature also slows down the growth of bacteria.

16. What is fermentation? How is it useful?

The process of production of alcohol from sugar by the yeast is called fermentation. It is useful in production of wine, baking of bread, making idlis and dosas.