Grade VIII:
Lesson 2. Micro-Organisms: Friend and Foe

MICROORGANISMS

Living organisms that cannot be seen with our necked eyes are known as Micoorganisms

Friendly Microorganisms

Marking of Cured and Bread

- The bacterium, Lactobacillus promotes the formation of curd. It multiplies in milk and converts it into curd.
- Yeast reproduces rapidly and produces carbon dioxide during respiration. Bubbles of he gas fill the dough and increases its volume so yeast is used in the banking industry for making breads, pastries and cakes.

Medicinal Use

- Medicines kill or stop the growth of the disease – causing microorganisms.
- Such medicines are called antibiotics.
- Antibiotics are being produced from bacteria and fungi.

Increasing Soil Fertility

Bacteria and blue green algae are able to fix nitrogen from the atomosphere to enrich soil with nitrogen and increase its fertility.

Commercial Use

- Used for the large scale production of alcohol, wine and acetic acid (vinegar).
- Yeast is used for commercial production of alcohol and wine.

Vaccine

- Vaccines are made on a large scale from microorganism to project humans and other animals from .microorganism to protect humans and other animals from several diseases.
- Several diseases, including cholera, tuberculosis, smallpox and hepatitis can be prevented by vaccination.

Cleaning of Environment

- The microorganisms decomposes dead organic waste of plants and animals converting them into simple substances.
- These substances are again used by other plants and animals.
- Microorgansms can be used to degrade the harmful and smelly substances and thereby clean up the environment.smelly substaunces and thereby clean up the environment

Harmful Microorganisms

Some of the microorganisms causes diseases in human beings, plants and animals. Such disease causing microorganisms are called pathogens.

Disease – causing Microorganisms in Humans

- Diseases that can be spread from an infected person to a healthy person are called communicable diseases.
- They are caused by pathogens that can enter the body through the air we breathe, water we drink and food we eat.

Disease – causing Microorganisms in Animals

Anthrax: it is a fatal disease of humans and cattle caused by a bacterium
Food and Mouth Diseases : it is a diseases that affects cattle and is caused by a virus.

Disease – causing Microorganisms in Plants

Citrus Canker: Caused by bacteria and is spread by air
Rust of Wheat: Caused by fungi and spreads through air and seeds.
Yellow Vein Mosaic of Okra (bhindi) : Caused by virus and spread by insects.

Food Poisoning

Foods are spoilt by microorganisms when they get favourable conditions of air, warmth and moisture. Increases in number and produce toxic substances that are harmful and poisonous.

Name of the Disease	Pathogen	Mode of Transmission
Tuberculosis	Bacteria	Air/Personal contact
Cholera	Bacteria	Water
Typhoid	Bacteria	Water
Measles	Virus	Air/Personal Contact
Hepatitis B	Virus	Water
Malaria	Protozoa	Mosquito
Chickenpox	Virus	Air/Personal contact
Polio	Virus	Air/Personal Contact

Food Preservation

Chemical method

Preservatives like sodium benzoate and sodium metabisulphite are used in jams and squashes.

By common salt

- The presence of high concentration of salts (15% to 18%) drains out the water from food materials through a process called osmosis and prevents bacterial growth which spoils the food.
- The vegetable and fruits such as tamarind, beans, raw mango, amla, and non-vegetable items like fish and meat are often preserved by using salt.

By Sugar

Sugar syrup containing more than 68% sugar also stops bacterial growth as very less free moisture is available for, it Microorganisms that are already present in the food materials, therefore,

By Oil and Vinegar

Oil and vinegar is used in the preparation of pikles, chutney, ketchups and squashes. These preservatives do not allow the growth of microorganisms and thus help in preserving the food.

Heat and Cold Treatments

- Heating is used for killing germs in milk at home. Thus, Milk, is prevented from spoilage by boiling.
- Milk is made germ free by pasteurization. In this process milk is heated at 70° C for 15 seconds and is then suddenly chilled and stored, this prevents the growth of microbes, this process was discovered by Louis Pasteur.

Storage and packing

These days dry fruits and even vegetables are sold in airtight packets to prevent the attack of microbes.

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Objective Type Questions

(1 Mark each)

I. Multiple choice questions

1. Which is not classified as major group of the micro-organisms?

a. Bacteria b. Fungi c. Protozoa d. Plants

2. Viruses reproduce only inside the cells of

a. Host organism b. Only surface of microbes

c. Plants d. Animals

3. Typhoid is a _____ disease.

a. Protozoan b. Viral c. Bacterial d. Fungi

4. This bacterium promotes the formation of milk into curd.

a. Rhizobium b. Lactobacillus c. Aedes d. All

5. This micro-organism is used for the large scale production of alcohol, wine and acetic acid.

a. Ameoba b. Paramecium c. Chlamydomonas d. Yeast

6. Edward Jenner discovered.

a. Fermentation b. Antibiotics c. Vaccine d. None of these

7. The process of conversion of sugar into alcohol in the absence of oxygen is called.

a. Pasteurization b. Vaccination c. Fermentation d. Decomposition

8. Nitrogen fixation is brought about by.

a. blue-green algae b. bacteria c. both (a) and (b) d. None of these

9. Which is not a communicable disease?

a. Diabetes b. Chicken pox c. Tuberculosis d. Cholera

10. Which is the plant disease caused by micro-organisms?

a. Measles b. Small pox c. Citrus Canker d. Polio

1. d	2. a	3. c	4. b	5. d	6. c	7. c	8. c	9. a	10. c

II. Multiple choice questions

1. Penicillium is a

a. Algae b. Fungus c. Bacteria d. Yeast

2. Malaria is caused by

a. Protozoa b. Virus c. Algae d. Bacteria

3. Mushrooms belong to

a. Algae b. Virus c. Fungi d. None of these

4. Rhizobium bacteria

a. Help in digestion b. Help in nitrogen fixation

c. Cause various diseases d. All of above

5. Coci are _____ shaped bacteria.

a. Rod-shaped b. Round-shaped c. Spiral d. Comma

6. Amoeba belongs to

a. Algae b. Fungi c. Protozoa d. Virus

7. Microorganisms are

a. Unicellular only b. Multicellular only

c. Both unicellular and multicellular d. None of these

8. Spirogyra is

a. An algae b. A fungi c. A protozoa d. A bacteria

9. Scientist who discovered the fermentation

a. Alexander Fleming b. Louis Pasteur c. John Mendal d. Charles Darwin

10. Amount of nitrogen in atmosphere is

a. 58% b. 68% c. 78% d. 88%

11. Vaccine for small pox is discovered by

a. Louis Pasteur b. Alexandar Fleming c. Edward Jenner d. John Mendal

1. b	2. a	3. c	4. b	5. b	6. c	7. c	8. a	9. b	10. c	11. c

I. Fill in the blanks

1. Some _____ and _____ present in the soil fix nitrogen from the atmosphere.
2. Protozone cause serious diseases such as _____ and _____.
3. Milk can be pasteurized by the _____ treatment.
4. _____ and _____ are the common chemical preservatives.
5. Bread left unused under moist conditions is attacked by _____.
6. _____ is a dangerous human and cattle disease caused by a bacterium.

7. By keeping the surroundings clean and dry, we can prevent _____ from breeding.
8. Disease that can spread from an infected person to a healthy person is called _____ disease.
9. A worldwide campaign against _____ has finally led to its eradication from most parts of the world.
10. Medicines that kill or stop the growth of disease causing micro-organisms are called _____.

1. bacteria, blue-green algae	2. typhoid and Tuberculosis	3. hot and cold
4. salts and edible oils	5. fungus	6. anthrax
7. mosquitoes	8. communicable	9. small pox
10. antibiotics		

II. Fill in the blanks

1. The pathogens are _____ causing organisms.
2. An edible fungus is _____.
3. All microorganisms are _____ harmful.
4. The antibiotics, first discovered by Alexander Fleming is called _____.
5. Rhizobium is found in the root nodules of _____ plants.
6. Vaccine for small pox was discovered by _____.
7. Disease causing microorganisms are called _____.
8. A disease common in human and other animals is _____.
9. Foot and mouth disease is a _____ disease in cattles.
10. _____ bacteria is a nitrogen fixing bacteria.

1. Disease	2. Mushroom	3. Not	4. Penicillin	5. Legume
6. Edward Jenner	7. Pathogens	8. Anthrax	9. Viral	10. Rhizobium

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I. Match the following

1. Match the items given in Column A with those in Column B suitably.

Column A		Column B	
(i)	Polio	(a)	Legumes
(ii)	Malaria	(b)	Antibiotics
(iii)	Rhizobium	(c)	Yeast
(iv)	Alexander Fleming	(d)	Viral disease
(v)	Bread making	(e)	Mosquito

(i). (d)	(ii). (e)	(iii) . (a)	(iv) . (b)	(v) . (c)

2. Match the items given in Column A with those in Column B suitably.

Column A		Column B	
(i)	Fermentation	(a)	Viral disease
(ii)	Alexander Fleming	(b)	Antibiotics
(iii)	Foot and mouth disease	(c)	Edward Jenner
(iv)	Vaccine for small pox	(d)	Anthrax
(v)	Human and animal disease	(e)	Louis Pasteur

(i). (e)	(ii). (d)	(iii) . (a)	(iv) . (c)	(v) . (d)

II. Match the following

Column I	Column II
1. Louis Pasteur	i. Pasteurization
2. Lactobacillus	ii. Increases soil fertility
3. Penicillin	iii. Aedes
4. Alexander Fleming	iv. Mould
5. Biological nitrogen fixers	v. Virus fixers
6. Malaria	vi. Vaccine
7. Edward Jenner	vii. Fungi (Plants)

8. Dengue	viii. Fermentation
9. Hepatitis A	ix. Curd
10. Rust of Wheat	x. Pencillin
11. Hot and cold treatment	xi. Female Anopheles

1. viii	2. ix	3. iv	4. x	5. ii	6. xi	7. vi	8. iii	9. v	10. vii	11. i

III. Match the following.

I. Column A	Column B
a. Louis Pasteur	i. Penicillin
b. Robert Koch	ii. Anthrax bacterium
c. Edward jenner	iii. Fermentation
d. Alexander Fleming	iv. Small pox vaccine
	v. Typhoid

a. iii	b. ii	c. iv	d. i

II. Column A	Column B
a. Lactobacillus	i. Algae
b. Aspergillus	ii. Protozoa
c. Spirogyra	iii. Fungi
d. Paramecium	iv. Bacteria

a. iv	b. iii	c. i	d. ii

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True or False

1. Microorganisms can be seen with naked eyes.
2. Viruses can only multiply in a living cell.
3. Louis Pasteur was the first scientist who discovered the Penicillin.
4. Rhizobium is a bacteria which can fix the atmospheric nitrogen.
5. Mushroom is a fungi.
6. Disease-causing microorganisms are called pathogens.
7. Anthrax is the common disease in human and other animals.
8. Oxygen and nitrogen make 78% of air.
9. Edward Jenner discovered the process of fermentation.
10. Foot and mouth disease is bacterial disease in animals.

1. False	2. True	3. False	4. True	5. True	6. True	7. True	8. False	9. False	10.False

Quiz Time

1. **Name a multicellular microorganism.**
2. **What are the substances that are used to kill microorganisms?**
3. **Who is the inventor of first antibiotics?**
4. **Louis Pasteur discovered a process in 1857. What is that?**
5. **Who discovered the vaccine for small pox?**
6. **Who is the carrier of dengue virus?**
7. **Name the pathogen of anthrax?**
8. **Name any two common preservatives.**
9. **Name the microorganism, which is used in baking industry?**
10. **Name the viral disease most common in cattles.**
11. **Which microorganisms reproduce only inside the host organism?**
12. **I saw that my mother added a little cured to warm milk to set curd for the next day. Why does she do so?**
13. **Why should we not take antibiotics unnecessarily?**

14. Are antibiotics effective against viruses, which cause cold and flu?

15. Who discovered the bacterium (Bacillus anthracis) which causes anthrax disease?

Answers:

1. Bread mould
2. Antibiotics
3. Alexander Fleming
4. Fermentation
5. Edward Jenner
6. Female Aedes Mosquito
7. Bacillus anthracis
8. (i) Sugar (ii) Vinegar
9. Yeast
10. Foot and mouth disease
11. Virus
12. Curd contains bacterium called Lactobacillus which promotes fermentation of curd.
13. Antibiotics may kill the beneficial bacteria in our body.
14. No, antibiotics are ineffective in case of diseases caused by viruses.
15. Robert Koch (1876)

NCERT Corner

Intext Question

1. Boojho wants to know why certain living organisms are called micro-organisms or microbes.

The micro-organisms are so small in size that they cannot be seen with the naked eye and some of these can be seen only by microscope. That is why these are called micro-organisms.

2. Paheli saw that her mother added a little curd to warm milk to set curd for the next day. She is wondering. Why?

Curd contains several micro-organisms, mainly the bacterium, Lactobacillus, which promote the formation of curd. They start growing in milk and convert milk into curd.

3. Paheli wants to know why children /infants are given vaccination.

By vaccination, disease carrying microbes enters our body, the body produces antibodies to fight the invader. The body also remembers how to fight the microbes are introduced in a healthy body, the body fights and kills them by producing suitable antibodies. The antibodies remain in the body and we are protected from the disease-causing microbes. This is how a vaccine works.

4. How do you prevent the spread of communicable diseases?

We should keep a handkerchief on the nose while sneezing. It is better to keep distance from infected persons.

5. Paheli is wondering why teacher keeps telling them not to let water stagnate anywhere in the neighbourhood.

All mosquitoes breed in water. Hence by keeping the surroundings clean and dry, we can prevent mosquitoes from breeding. One should not let water collect anywhere viz., in coolers, tyres, flower-pot etc.

6. Paheli wonders how food can become poisonous.

Food poisoning could be due to the consumption of food spoilt by some microorganisms. Micro-organisms that grow on our food sometimes produce toxic substances. These make the food poisonous causing serious illness and even death.

7. Boojho wants to know what is pasteurization.

The milk is heated to 700C for 15 seconds and then suddenly children and stored. By doing so, it prevents the growth of microbes. This process was discovered by Louis Pasteur. It is called Pasteurization.

Textbook Question

1. Fill in the blanks.

i. Micro-organisms can be seen with the help of a _____.

ii. Blue green algae fix _____ directly from air to enhance fertility of soil.

iii. Alcohol is produced with the help of _____.

iv. Cholera is caused by _____.

i. Microscope	ii. Nitrogen	iii. Yeast	iv. Bacteria

2. Tick the correct answer.

i. Yeast is used in the production of

a. Sugar **b. Alcohol** **c. Hydrochloric acid** **d. Oxygen**

ii. The following is an antibiotic.

a. Sodium bicarbonate **b. Streptomycin**

c. Alcohol **d. Yeast**

iii. Carrier of malaria-causing protozoan is

a. Female anopheles mosquito **b. Cockroach**

c. Housefly **d. Butterfly**

iv. The most common carrier of communicable diseases is

a. Ant **b. Housefly** **c. Dragonfly** **d. Spider**

v. The bread or idli dough rises because of

a. Heat **b. Grinding** **c. Growth of yeast cells** **d. Kneading**

vi. The process of conversion of sugar into alcohol is called.

a. Nitrogen Fixation **b. Moulding** **c. Fermentation** **d. Infection**

i. b. Alcohol is produced by the action of yeast. ii. b. Streptomycin is an antibiotic effective against tuberculosis
iii. a. female Anopheles mosquito is the carrier of malaria
iv. b. The most common carrier of communicable diseases is Housefly.
v. c. Idli dough rises due to growth of yeast cells.
vi. c. Fermentation.

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

Column I	Column II
(i) Bacteria	(a) Fixing nitrogen
(ii) Rhizobium	(b) Setting of curd
(iii) Lactobacillus	(c) Baking of bread
(iv) Yeast	(d) Causing malaria
(v) A protozoan	(e) Causing cholera
(vi) A virus	(f) Causing AIDS
	(g) Producing antibodies

(i) (e)	(ii) (a)	(iii) (b)	(iv) (c)	(v) (d)	(vi) (f)

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

Micro-organisms cannot be seen with the naked eyes. They can be seen with the help of a microscope.

5. What are the major groups of micro-organisms?

Micro-organisms are divided into four major groups which are as follows :

(i) Bacteria : These are single celled organisms which are harmful, as they cause disease and some of them may be useful as in vaccines.

(ii) Fungi : These are non-green plants which consume their food from the dead organic matter.

(iii) Protozoan : These are unicellular animals which cause diseases like malaria and dysentery.

(iv) Algae : These are photoautotrophic organisms that may be unicellular or multicellular. They play important role in medicines, agriculture, industry and as food. Viruses are also considered to be micro-organisms but are actually the connecting links between non-living and living organisms.

6. Name the micro-organisms which can fix atmospheric nitrogen in the soil.

Bacteria, like Rhizobium and blue green algae can fix atmospheric nitrogen in the soil.

7. Write ten lines on the usefulness of micro-organisms in our lives.

Uses of micro-organisms :

(i) Micro-organisms are used in making of curd and bread.

(ii) Bacteria are also involved in the making of cheese, pickles and many other food items.

(iii) Acetobacter aceti bacteria is used for production of acetic acid from alcohol.

(iv) Yeast is used for commercial production of alcohol and wine.

(v) The antibiotics manufactured by growing specific micro-organisms are used to cure a variety of diseases.

(vi) Micro-organisms fix the nitrogen of atmosphere into soil giving rise to fertility of soil.

(vii) Micro-organisms decompose waste into simple materials and clean-up the atmosphere.

(viii) Micro-organisms decompose the dead organic varieties of plants and animals.

(ix) Vaccines are made by dead or weakened microbes.

(x) Certain microbes are also used in the biological treatment of sewage and industrial effluents.

8. Write a short paragraph on the diseases caused by micro-organisms.

Micro-organisms are also very harmful to us. They cause a number of diseases in humans as well as in other animals. Common cold, Tuberculosis, Measles, chicken pox, polio, cholera, typhoid, hepatitis-B, malaria are some common human diseases caused by micro-organisms. Anthrax is a serious disease in animals caused by microbes. They also make food items unfit for use by food poisoning. They also spoil clothes and leather products. They also cause diseases in plants like blights in potatoes, sugarcanes, oranges, etc. They also reduce the crop production.

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

Antibiotics are tablets, capsules or injections which are used to kill or stop the growth of pathogens, i.e. disease causing microbes. Penicillin, tetracycline are the examples of antibiotics.

Precautions:

(i) It should be taken in proper dose only on the advice of qualified doctors.

(ii) Complete course prescribed by the doctor.

(iii) It should not be taken without any reason, or requirement.

(iv) Antibiotics taken unnecessarily may kill the beneficial bacteria in the body.

I. Very Short Answer Type Questions.

1. What are microorganisms or microbes?

The organisms which are not visible to our naked eyes are called microorganisms or microbes.

2. Give two examples of microorganisms.

Bacterial and Fungi

3. What are the four major groups of microorganisms?

(i) Bacteria (ii) Fungi

(iii) Protozoa (iv) Algae

4. Name two habitats of microorganisms.

(i) Soil (ii) Water

5. What are viruses?

Very tiny microscopic organisms which reproduce only inside the cells of host organisms are called viruses.

6. Write the names of some diseases caused by virus.

Influenza (Flu) , Polio and Chicken Pox are some diseases caused by viruses.

7. Name some diseases caused by Protozoa.

Dysentery and Malaria

8. Mention any two diseases caused by bacteria.

Typhoid and Tuberculosis (TB) are bacterial diseases.

9. Name two single-celled microorganisms.

(i) Bacteria (ii) Some algae

10. Name two multicellular microorganisms.

(i) Fungi (ii) Algae

11. Mention two groups of microorganisms which live in colonies.

(i) Bacteria (ii) Fungi

12. What are the two types of microorganisms on the basis of their functions?

(i) Useful microorganisms (ii) Harmful microorganisms

13. Name the microorganisms which promote the formation of curd.

Bacterium Lactobascillus promotes the formation of curd.

14. What is fermentation?

The process of conversion of sugar into alcohol is known as fermentation.

15. Name the scientist who discovered fermentation.

Louis Pasteur discovered fermentation in 1857.

16. What are antibiotics?

The medicines which kill or stop the growth of the disease-causing microorganisms are called antibiotics.

17. Who discovered antibiotics?

Alexander Fleming in 1929.

18. Name some antibiotics.

Streptomycin, tetracycline and Erythromycin are some antibiotics.

19. What do you mean by the antibodies?

When a disease carrying microbe enter the body, the body produces a substance to fight the invader, these are called antibodies.

20. What is vaccine?

The medicine used to protect the children from several diseases is called vaccine.

21. What do you mean by vaccination?

The process of providing vaccine is called vaccination.

22. Name a popular vaccination programme.

Pulse Polio Programme

23. Who discovered the vaccine for small Pox?

Edward Jenner in 1798.

24. What do you mean by nitrogen fixation?

The process by which atmospheric nitrogen is converted into nitrates by the action of microorganisms is called nitrogen fixation.

25. What are pathogens?

The disease-causing microorganisms are called pathogens.

26. How do pathogens enter in our body?

The pathogens enter our body through air, water and food.

27. Name two communicable diseases.

Cholera and Chicken Pox

28. What are carriers of disease-causing microbes?

The insects and animals which help in the transmission of the pathogens from source to the persons are called carriers of disease-causing microbes.

29. Which is the carrier of dengue virus?

Female Aedes mosquito.

30. Why should we not let water collect anywhere?

All mosquitoes breed in water. Hence we should not let water collect anywhere.

31. Name a disease which is common in human and other animals.

Anthrax

32. Name the pathogen of anthrax.

Bacillus anthracis.

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33. Write the name of one viral disease in cattle.

Foot and Mouth disease.

34. What do you mean by food preservation?

The process of preserving food items, to prevent the spoilage from microorganisms is called food preservation.

35. What are preservatives?

The chemicals which are used to check the growth of microorganisms in food for preserving food are called preservatives.

36. Name some preservatives.

Sugar, salt , oil and vinegar are some common preservatives.

37. Which microorganisms are called nitrogen fixing bacteria?

Rhizobium bacteria

38. Where do Rhizobium bacterial commonly live?

Rhizobium bacteria live in the root nodules of leguminous plants.

39. What do you mean by symbiotic relationship?

The relationship between two organisms in which both the organisms are benefitted is called symbiotic relationship.

40. Mention the amount of nitrogen gas in atmosphere.

78%

41. Name the causative micro-organism of common cold.

Virus

42. Name the bacterium causes anthrax disease.

Bacillus anthracis

43. Is spoilage of food, a chemical reaction?

Yes, spoilage of food is a chemical reaction.

44. What is yeast?

Yeast is a single celled organism which helps in fermentation.

II. Very Short Answer Type Questions.

1. What is fermentation ?

The process of conversion of sugar into alcohol is known as fermentation.

2. Identify the organism given below. Where does it reproduce ?

Virus. It reproduces in the host cell.

3. Name two commonly known antibiotics.

Streptomycin, tetracycline.

4. Which micro-organisms are able to fix nitrogen from the atmosphere ?

Some bacteria and blue-green algae are able to fix nitrogen from the atmosphere.

5. Name two algae which help in nitrogen fixation.

Anabaena and Nostoc are two blue-green algae which help in nitrogen fixation.

6. Name the carrier insect that carries the parasite of malaria.

Female Anopheles mosquito carries the parasite of malaria.

7. How can we prevent mosquitoes from breeding ?

All mosquitoes breed in water. Hence, one should not let water collect anywhere, in coolers, tyres, flowerpots etc. By keeping the surroundings clean and dry we can prevent mosquitoes from breeding.

8. How does sugar preserve the food substance ?

Sugar reduces the moisture content in food which inhibits the growth of bacteria to spoil food.

9. Why are dry fruits and vegetables sold in sealed air packets these days ?

These days dry fruits and even vegetables are sold in sealed air tight packets to prevent the attack of microbes.

10. How do animals get proteins and other nitrogen compounds ?

Animals feeding on plants get proteins and other nitrogen compounds.

11. Yeast is used for commercial use. Write one commercial use of yeast.

(NCERT Exemplar)

Baking bread, manufacturing of alcoholic drinks is the commercial use of yeast.

12. Name the process in which yeast converts sugars into alcohol. **(NCERT Exemplar)**

Fermentation is the process by which yeast converts sugars into alcohol.

13. In the soil, which nutrient is enriched by blue-green algae (cyanobacteria)?

(NCERT Exemplar)

Nitrogen is enriched by cyanobacteria.

14. Name the vaccine which is used against tuberculosis.

BCG vaccine.

III. Very Short Answer Type Questions.

1. Suggest a suitable word for each of the following statement.

a. Chemicals added to food to prevent growth of microorganisms.

b. Nitrogen –Fixing microorganism present in the root nodules of legumes.

c. Agent which spreads pathogens from one place to another.

d. Chemicals which kill or stop the growth of pathogens.

a. Preservatives b. Rhizobium

c. Carrier/ vector d. Antibiotics

2. Name one commercial use of yeast.

Baking bread/ manufacture of alcoholic drinks.

3. Name the Process in yeast that converts sugars into alcohol.

Fermentation

4. In the soil, which nutrient is enriched by blue-green algae (cyano bacteria)?

Nitorgen

5. Why should we avoid standing close to a tuberculosis patient while he/she is coughing?

Tuberculosis is an air-borne disease which easily spreads when the infected person coughs.

6. Polio drops are not given to children suffering from diarrhea. Why?

If the child is suffering from diarrhea, the orally given vaccine may be excreted out because of frequent motions.

I. Short Answer Type Questions.

1. Classify the following into friendly and harmful microorganisms.

Yeast, malarial parasite, lactobacillus, bread mould, Rhizobium, Bacillus anthracis

Friendly	**harmful**
Yeast	Malarial Parasite
Lactobacillus	Bread mould
Rhizobium	Bacillus anthrocis

2. While returning form the school, Boojho ate chat from a street hawker, when he reached home, he felt ill and complained of stomach ache. What could be the reason?

The probable reason is that the chat was contaminated by pathogenic microbes due to unhygienic conditions near the shop or the utensil used for serving could have contaminated.

3. What will happen to 'pooris' and 'unsed kneaded flour' if they are left in the open for a day or two?

The 'unused kneaded flour', if left in warm conditions, gets infected by microbes which cause fermentation and spoils the flour. The pooris would remain in regulatively good condition because they were deep fried in heated oil that kills microbes.

4. a. Name two diseases that are caused by virus.

b. Write one important characteristic of virus.

a. Polio/chickenpox/influence

b. Virus can reproduce only inside the cells of host.

5. Why we have to add a little curd to warm milk to set curd for next day?

Curd contains several microorganisms, of these the bacterium, lactobacillus promotes the formation of curd. It multiples in milk and converts it into curd.

6. What do you mean by communicable disease ?

The microbial diseases that can spread from an infected person to a healthy person by some agents like air, water, food or physical contact are called communicable diseases.

7. How should we prevent spread of communicable disease?

We should keep a handkerchief on the nose and mouth while sneezing. It is better to keep a distance from infected person.

8. How do vaccines work?

Vaccines contain dead or weakened microbes of a particular disease. When a vaccine is introduced into a healthy body. The body fights and kills them by producing suitable antibodies. These antibodies remain in the body and protect it when the microbe enters the body again.

II. Short Answer Type Questions.

1. What are viruses? Name some common diseases in humans caused by virus.

Viruses are microscopic organisms but are not considered as micro-organisms. They however, reproduce only inside the cells of host organism, which may be a bacterium, plant or animal. Some diseases like cold, influenza (Flu), polio and chicken pox are caused by viruses.

2. How do microorganisms survive under adverse conditions?

Under unfavourable conditions of temperature and water, they generally form a hard and tough covering called cyst. This protects them. When favourable conditions come, they emerge from their shell, multiply and go through their life cycle.

3. How do microorganisms act as a cleaning agent of nature?

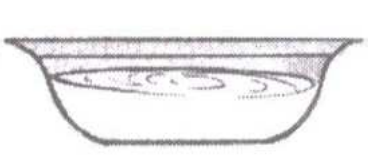
Microorganisms are also used in cleaning up of the environment. The organic wastes like vegetable peels and remains of animals are broken down into harmless and usable substances by the action of microorganisms. In agriculture, they are used to increase soil fertility by fixing nitrogen and by making manure.

4. Explain the formation of curd from the milk.

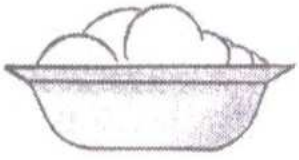
Curd contains several microorganisms. Of these, the Lactobacillus bacterium causes the formation of curd. It multiplies in milk and converts it into the curd.

5. What is the role of yeast in baking industry?

Yeast plays an important role n the baking industry. Yeast reproduce rapidly and produce carbon dioxide during respiration. Bubbles of the gas fill the dough and increase its volume. This is the basis of use of yeast in the baking industry for making breads, pastries and cakes.



Wheat flour (maida) with yeast powder



Dough formation of wheat flour

6. Explain the commercial use of microorganisms.

Microorganisms are used for large scale production of alcohol, wine and acetic acid (vinegar). Yeast is used for commercial production of alcohol and wine. For this purpose , yeast is grown on natural sugar present in grains. Yeast converts sugar into alcohol. This process is called fermentation. Microorganisms are also used to prepare medicines like antibiotics.

7. Mention some beneficial effects of bacteria.

(i) They help in nitrogen-fixation to increase soil fertility.

(ii) They are used to make vinegar, curd etc.

(iii) They help in the cleaning of environment by the decomposition of organic wastes.

(iv) They are also used in making medicines like antibiotics.

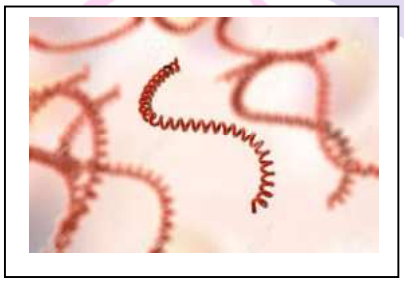
8. Explain the various types of bacteria.

The bacteria are classified into three types on the basis of their shape.

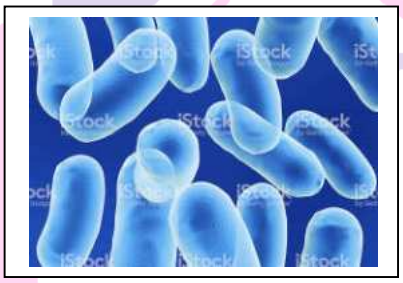
(i) Rod shaped (Bacillus) : These are long and rod shaped bacteria, e.g., lactobacillus

(ii) Round shaped (Coccous): They are round shaped , e.g., streptococcus.

(iii) Spiral : These are comma shaped bacteria, e.g., Triponema.



Spiral bacteria



Rod shaped bacteria

9. What are antibiotics? Explain with the help of examples.

The medicines which are used to kill or stop the growth of the disease-causing microorganisms are called antibiotics. The first antibiotic is Penicillin. It was discovered by Alexander Fleming in 1929. Now a days, large number of antibiotics are being produced from bacteria and fungi. For example : Streptomycin, Tetracycline and Erythromycin.

10. Explain the discovery of Penicillin.

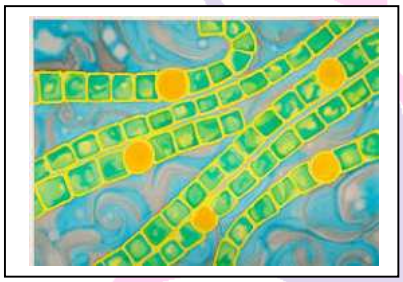
In 1929, Alexander Fleming was working on a culture of disease-causing bacteria. Suddenly, he found the spores of a little green mould in one of his culture plates. He observed that the presence of mould killed and retarded the growth or bacteria. From this, the mould penicillin was prepared.

11. Explain , how does a vaccine work.

When a disease carrying microbe enters our body, the body produces antibodies to fight the invader. The body also remember how to fight the microbe, if it enters again. So, if dead or weakened microbes are introduced into the healthy body, the body fights and kills the microbes by producing suitable antibodies. The antibodies remain in the body and we are protected from disease-causing microbes. This is how, a vaccine works.

12. Describe the role of bacteria in fertility of soil.

Some bacteria are able to fix the atmospheric nitrogen, to enrich soil with nitrogen and increases its fertility. These microbes are commonly called biological nitrogen fixers. In this way, bacteria and blue green algae increases fertility of soil.



13. Explain the cleaning action of micro-organisms.

Microorganisms are called the cleaning agents of nature. Collect waste of plants, vegetables and fruits from your nearby surroundings. Put them in a pit meant for waste disposal. After some time, it decomposed and get converted to manure by the action of microorganisms. In this way, the waste products are converted into useful manure by the action of microbes. This is how, microorganisms acts as cleaning agents of nature.

14. How do microorganisms spoil food?

Microorganisms grow on the food materials and multiply rapidly. They release toxins in the food and make them unfit to consume. They breakdown the food molecules into amines and change the taste, texture and appearance of food.

15. What are communicable diseases? Explain with examples.

The microbial diseases that can spread from an infected person to a healthy persons through air, water, food or physical contact are called communicable diseases. Examples of such diseases include cholera , common cold, chicken pox and tuberculosis.

16. What do you mean by food poisoning?

Some microorganisms get settled on the food stuff. They release the toxic substances in the food stuff. This makes the food contaminated and unfit for use. This is called food

poisoning. If anyone consumes this food, it can produce fatal results. Serious illness is caused and patient get frequent vomiting and loos motion. This physical condition can even lead to death. So it is very important that, we preserve food from spoilage.

17. What is pasteurisation of milk?

Pasteurised milk can be consumed without boiling as it is free from harmful microbes. The milk as heated to about 70°C for 15 to 30 seconds and then suddenly chilled and stored. By doing so, milk is protected from the growth of microbes. This process was discovered by Louis Pasteur, so it is called pasteurisation.

III. Short Answer Type Questions-I

1. How do some micro-organisms clean up the environment ?

Some micro-organisms decompose the organic waste and dead plants and animals into simple substance and clean up the environment.

2. What is the basis of the use of yeast in the baking industry ?

Yeast reproduces rapidly and produces carbon dioxide during respiration. Bubbles of gas fill the dough and increase its volume. This is the basis of the use of yeast in baking industry.

3. What are communicable diseases ?

Microbial diseases that can spread from an infected person to a healthy person through air, water food or physical contact, are called communicable diseases. e.g. cholera, common cold, etc.

4. What are general preventive measures to protect ourselves from cholera ?

To prevent ourselves from cholera we should maintain personal hygiene and good sanitary habits.

5. How are micro-organisms useful for commercial productions ?

Micro-organisms are commercially used for the large scale production of alcohol, wine and acetic acid. Yeast is commonly used for commercial production of wine and alcohol.

6. Who discovered the first antibiotic ? Name any two antibiotics.

Alexander Fleming discovered first antibiotic penicillin. Two other common antibiotics are streptomycin and tetracycline.

7. Why are vaccines so important for children ?

By introducing vaccine in body, the body fights and kills the bacteria by producing suitable antibodies. The antibodies remain in the body and the child is protected from the disease causing microbes.

8. How does common cold spread from infected person to a healthy person ?

When a person suffering from common cold sneezes, fine droplets of moisture carrying thousands of viruses are spread in the air. The virus may enter the body of a healthy person while breathing.

9. Polio drops are not given to children suffering from diarrhoea. Why?

(NCERT Exemplar)

If the child is suffering from diarrhoea, the polio drops that are orally given vaccine may be excreted out because of frequent motions and thus become ineffective.

10. Why should we avoid standing close to a tuberculosis patient while he/she is coughing?

(NCERT Exemplar)

Tuberculosis is an air-borne diseases which easily spreads when the infected person coughs as coughing spreads germs in the air. This is why, we should avoid standing close to a TB patient.

III. Short Answer Type Questions-II

1. How does housefly make us sick ?

Housefly is a carrier of disease-causing microbes. The flies sit on the garbage and animal excreta. Pathogens stick to their bodies. When these flies sit on uncovered food they may transfer these pathogens. Whoever eats this contaminated food is likely to get sick.

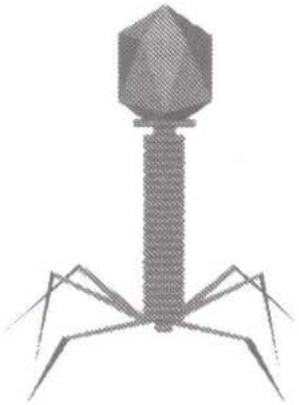
2. Who discovered the bacterium Bacillus anthracis? Which disease can be caused by it ? Is it harmful?

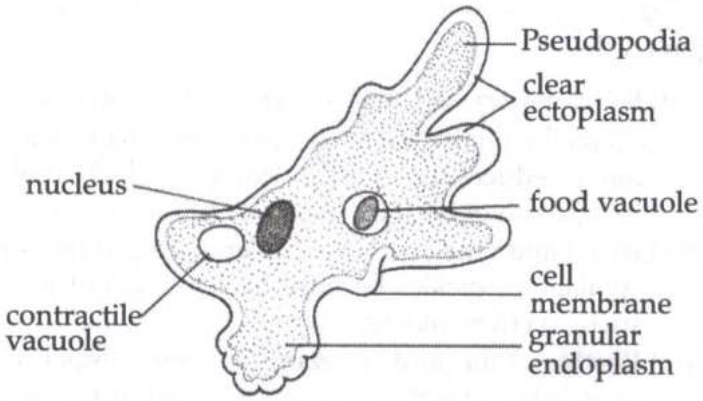
Robert Koch (1876) discovered the bacterium Bacillus anthracis, which causes anthrax disease. It is dangerous for humans and cattle both.

3. Why are salt and edible -oils also called preservatives ? Name two chemicals that are used as common preservatives.

Salt and edible oils are the common chemicals generally used to check the growth of micro-organism. Sodium benzoate and metabisulphate are common preservatives.

4. Draw structure of virus amoeba and label them.





5. We often see large amount of dead organic matter in the form of decaying matter. Where does it disappear after sometime ?

The dead organic matter disappears after sometime because the microorganisms decompose dead organic waste of plants and animals into simple substances. They are again used by other plants and animals.

6. Give preventive measures for Tuberculosis.

Tuberculosis is a bacterial disease. For prevention from this diseases we should :

(i) keep the patient in complete isolation.

(ii) keep the personal belongings of the patient away from those of the others.

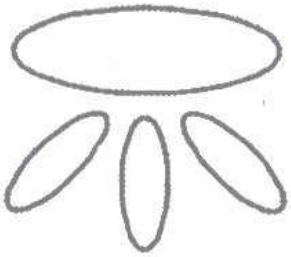
(iii) Vaccination should be given at suitable age.

7. Explain the various shapes of bacteria.

The bacteria are classified into three types on the basis of their shape :

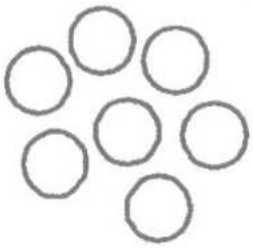
a. Road shaped (Bacillus):

Example: Lactobacillus



b. Round shaped (Coccus) :

Example : Streptococcus



c. Spiral shaped

Example : Treponema

8. Classify the following into friendly and harmful micro-organisms :

Yeast, malaria parasite, Lactobacillus, bread mould, Rhizobium, Bacillus anthracis.

(NCERT Exemplar)

Friendly	Harmful
(i) Yeast	(i) Malarial Parasite
(ii) Lactobacillus	(ii) Bread mould
(iii) Rhizobium	(iii) Bacillus anthracis

9. How do vaccines work? **(NCERT Exemplar)**

The body produce antibodies when a disease carrying microbe enters in it. The body also retains memory of this encounter to fight the microbe if it enters again. A vaccine consists of dead or weakened microbes which when introduced in a healthy body, produce suitable antibodies to fight and kill themselves. These antibodies remain in the body to protect it from disease causing microbes thus develop immunity.

10. How can we prevent the following diseases?

(i) Cholera (ii) Typhoid (iii) Hepatitis-A (NCERT Exemplar)

(i) Cholera : By maintaining personal hygiene and good sanitation practices.

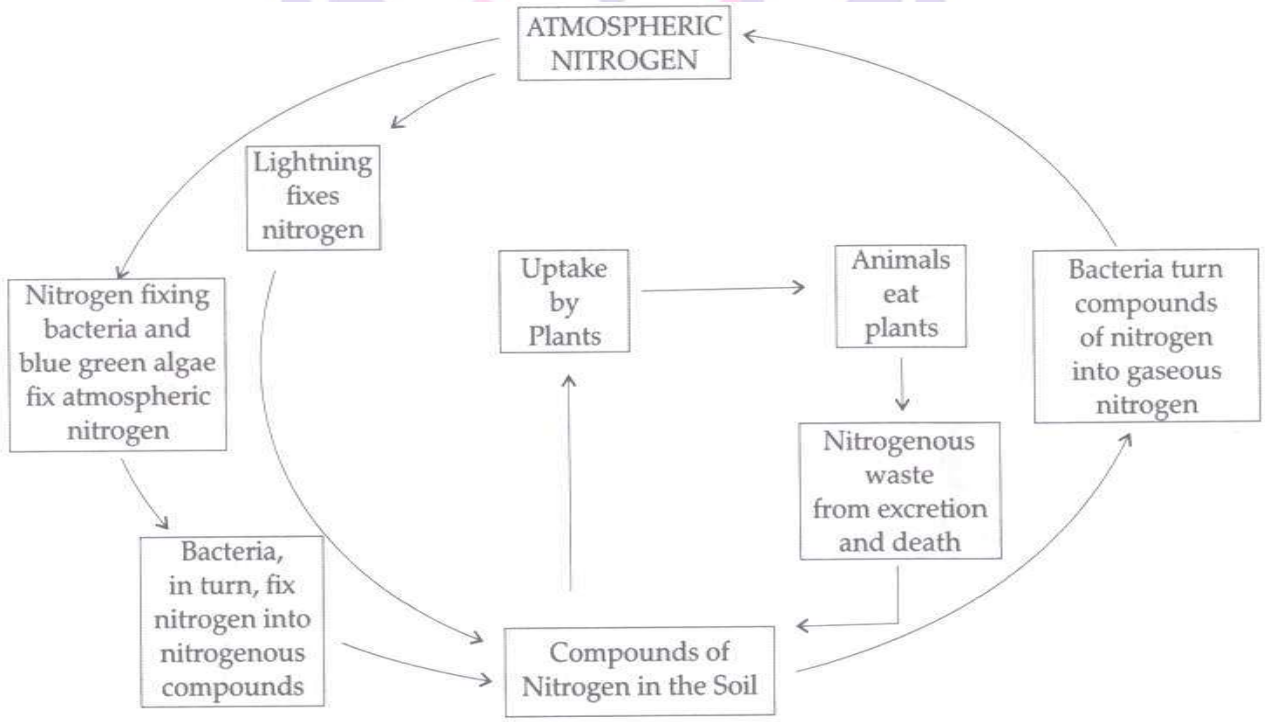
(ii) Typhoid : Eating properly cooked food, drinking boiled water and by getting vaccinated against the disease.

(iii) Hepatitis-A : Drinking boiled water and getting vaccinated against the disease.

I. Long Answer Type Questions.

1. Explain and draw nitrogen cycle.

Nitrogen cycle.



(i) Our atmosphere has 78% of nitrogen gas. Certain bacteria and blue-green algae are present in soil that fix nitrogen.

(ii) They convert it into compounds of Nitrogen.

(iii) These compounds can be used by plants through soil.

(iv) Plants synthesize proteins and other compounds. (v) Animals feeding on plants get these.

(vi) When plants and animals die, bacteria and fungi present in the soil decompose them and again convert into nitrogenous compounds.

(vii) Certain bacteria convert them into nitrogen gas, which goes back to the atmosphere.

2. What do you understand by food preservation ? Explain any four methods of food preservation.

Micro-organisms spoil our food. The process of keeping our food safe from micro-organisms is called food preservation. Various methods of food preservation are :

(i) Drying : It reduces the moisture of food material which prevents growth of micro-organisms.

(ii) By common salt and sugar : Meat and fish are covered with dry salt to check the growth of bacteria. Sugar reduces the moisture content, which inhibits the growth of bacteria that spoil food.

(iii) By oil and vinegar : Use of oil and vinegar prevents spoilage of pickles because bacteria cannot live in such an environment.

(iv) Refrigeration and freezing : Low temperature retards the growth of microbes. Thus, it is safe for food.

(v) By chemicals : Chemicals such as sodium benzoate and potassium metabisulphite are used in jams, squash and ketchup.

3. Write a short note on.

Useful micro-organisms.

Or

Harmful micro-organisms.

Useful micro-organisms :

(i) Friendly micro-organisms : They are used for various purposes. They are used in making curd (Lactobacillus bacteria) and bread. They are ingredients of Idli, Dhoklas and Bhaturas.

(ii) Commercial uses : Micro-organisms are used for the large scale production of alcohol and wine. Yeast is grown on natural sugars present in grains such as barley, wheat, rice, fruit juices for this purpose.

(iii) Medicinal uses : A very useful medicine group 'antibiotics' is prepared from micro-organisms. Commonly-used antibiotics are formed by fungi and bacteria. Vaccine also protects us from microbes.

(iv) Increasing soil fertility : Some bacteria and blue-green algae are able to fix nitrogen from atmosphere and form nitrogen compounds which increase the soil fertility.

(v) Decomposers : They decompose the dead organic substances into their constituents and clean the environment.

OR

Harmful micro-organisms :

(i) Pathogens : Disease causing micro-organisms are called pathogens. Diseases such as dysentery and malaria are caused by protozoa. Typhoid and tuberculosis are bacterial diseases. Virus causes common aliments such as cold, influenza and coughs.

(ii) Food spoilage : Some micro-organisms spoil food, clothing and leather. Fungus developed in moisture on leather and some food articles spoils them.

4. What are food preservatives? Explain some common food preservatives.

The chemical substances which are used to check or stop the growth of harmful micro-organisms in food are called food preservatives. These food preservatives keep the edible food materials protected from the invasion of micro-organisms which can spoil the food. Some common food preservatives are :

(i) Salt : Common salt is used to preserve meat, fish, amla raw mangoes, tamarind, etc.

(ii) Sugar : Jams, jellies and squashes are preserved by sugar. Sugar reduces the moisture content which inhibits the growth of bacteria, that can spoil food.

(iii) Oil : Edible oils are used as preservatives in vegetables and pickles. Oil does not allow the moisture to surface, thus preventing the growth of harmful bacteria.

(iv) Vinegar : It is used to preserve fruits, vegetables, fish, meat and pickles.

5. Explain the use of Bacteria, Fungi and Algae.

Uses of Bacteria:

(i) They are used to increase soil fertility by fixing nitrogen.

(ii) Some bacteria are used to produce antibiotics.

(iii) Lactobacillus bacterium converts milk into curd.

(iv) Some bacteria help in many functions of our body.

Uses of Fungi:

(i) Yeasts are used to prepare alcohol and vinegar by fermentation.

(ii) Mushrooms are eaten as food.

(iii) Penicillin is an antibiotic formed by a fungus called Penicillium.

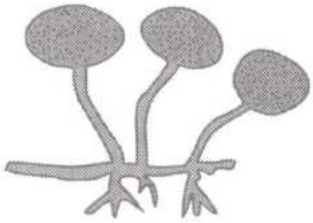
Uses of Algae:

(i) Algae are used to make jellies.

(ii) Chlorella is used to obtain proteins.

(iii) Silica from diatoms are used in toothpastes.

6. Observe the figure and answer the following questions :



(i) Name the micro-organism and the group to which it belongs.

(ii) Name the food items on which the organism grows.

(iii) Does it grow well in dry or in moist conditions?

(iv) Is it safe to eat infected bread? **(NCERT Exemplar)**

(i) Micro-organism is bread mould (Rhizopus) and the group is fungi.

(ii) Organism grows on moist and stale bread.

(iii) It grows well in moist conditions.

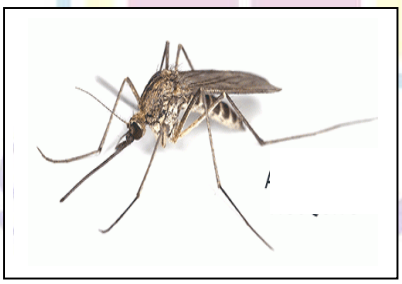
(iv) No, the fungus spoils the bread by producing poisonous substances (toxins).

II. Long Answer Type Questions.

1. What are carriers of disease-causing microbes? Explain with the help of two examples.

These are some insects and animals which carry the disease-causing microorganisms, e.g., housefly, mosquitoes.

(i) **Housefly** : Housefly is a carrier of microorganisms. They sit on the garbage and animal excreta. The pathogens stick to their bodies. When they fly, they sit on uncovered food, and may transfer the pathogens. Whoever eats the contaminated food is likely to get sick. So, we should not consume uncovered food.



Female Anopheles mosquito

(ii) **Female Anopheles Mosquito** : It is the carrier of the parasite of malaria (Plasmodium). It transfer the malarial parasite by its sting on the healthy person's body.

2. Explain the causative microorganisms, transmission mode of and preventive measure of the human diseases like Tuberculosis, Measles, Chicken Pox, Polio , Cholera, Typhoid, Hepatitis B and Malaria etc.

Some of the common diseases affecting humans, their mode of transmission and few general methods of prevention are given in the following table;

Human Disease	Causative Microorganisms	Mode of Transmission	Preventive Measures (General)
Tuberculosis Measles Chicken Pox Polio	Bacteria Virus Virus Virus	Air Air Air/Contact Air/Water	Keep the patient in complete isolation. Keep the personal belongings of the patient away, from those of the others. Vaccination to be given at suitable age.
Cholera Typhoid	Bacteria Bacteria	Water/Food Water	Maintain personal hygiene and good sanitary habits. Consume properly cooked food and boiled drinking water
Hepatitis B	Virus	Water	Drink boiled drinking water. Vaccination
Malaria	Protozoa	Mosquito	Use mosquito net and repellents. Spray insecticides and control breeding of mosquitoes by not allowing water to collect in the surroundings

3. Name some common plant disease, their causative microorganisms and mode of transmission with the help of figures.

Some common plant diseases caused by microorganisms are following;

Plant Diseases	Microorganism	Mode of Transmission
Citrus canker	Bacteria	Air
Rust of wheat	Fungi	Air , Seeds
Yellow vein mosaic of bhindi (Okra)	Virus	Insect

4. Explain some indications which help to detect the spoilage of food.

Indications to detect spoilage of food;

(i) Odour : The unpleasant and foul smell indicates that food is spoiled

(ii) Discolouration : The presence of microorganisms in food results in discolouration of food. Some fungus and moulds cause change in original colour.

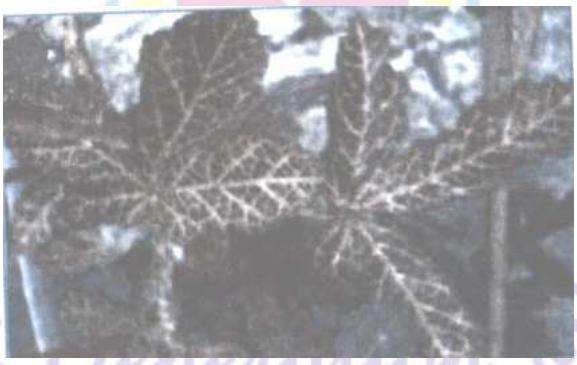
(iii) Taste : Sometimes the cooked food becomes sour. It is due to the production of acids by the action of certain bacteria.

(iv) Sliminess : Sometimes the food becomes slimy. It is also due to action of certain bacteria, thread like slims are also caused due to moulds.

(v) Gas formation : Due to action of bacteria, gases like, carbon dioxide are produced. They also spoil the food by making it to swell or become spongy.

III. Long Answer Type Questions.

1. Observe the figure given below and answer the questions that follows.



a. Write the name of the disease.

b. Name the causative agent of this disease.

c. How does the disease spread from one plant to another?

d. Name any two plant diseases and the microbes that cause them.

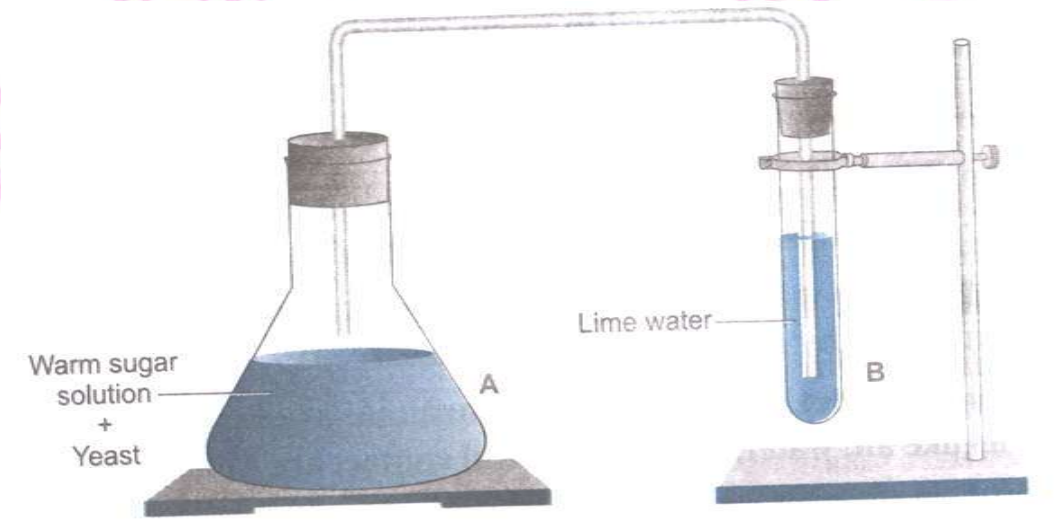
a. yellow vein mosaic of lady's finger/okra

b. Virus

c. The disease spreads from one plant to another through insects.

d. i. Citrus canker caused by bacteria

2. Observe the set-up given below and answer the following questions.



a. What happens to the sugar solution in A?

b. Which gas is released in A?

c. What changes will you observe in B when the released gas passes through it?

a. yeast causes fermentation converting sugar into alcohol and carbon dioxide.

b. Carbon dioxide

c. Lime water turn milky.

3. Given reasons for the following.

a. Fresh milk is boiled before consumption while processed milk stored in packets can be consumed without boiling.

b. Raw vegetables and fruits are kept in refrigerators whereas jams and pickles can be kept outside.

c. Farmers prefer to grow beans and peas in nitrogen deficient soils,

d. Mosquitoes can be controlled by preventing stagnation of water through they do not live in water.

a. fresh milk is boiled before consumption to kill the microorganisms in it. But packed milk is pasteurized and does not contain any microorganisms. It can thus be consumed without boiling.

b. Raw vegetables and fruits get easily infected by microorganisms and get spoilt. They are kept in refrigerator as low temperature inhibits growth of microbes. Jams and pickles contain sugar and salt as preservatives. They do not get infected by microbes easily

c. Beans and peas are leguminous plants and have rhizobium in their root nodules. These bacteria can fix atmospheric nitrogen to enrich the soil with nitrogen and increase its fertility.

d. Though mosquitoes live on land, their larvae grow in water. If water stagnation is prevented the larvae cannot survive.

4. How can we prevent the following diseases?

a. Cholera **b. Typhoid** **c. Hepatitis A**

a. Cholera : By maintaining personal hygiene and good sanitation practices.

b. Typhoid : Eating properly cooked food, drinking boiled water, getting vaccinated against the disease.

c. hepatitis A : Drinking boiled water and getting vaccinated against the diseases.

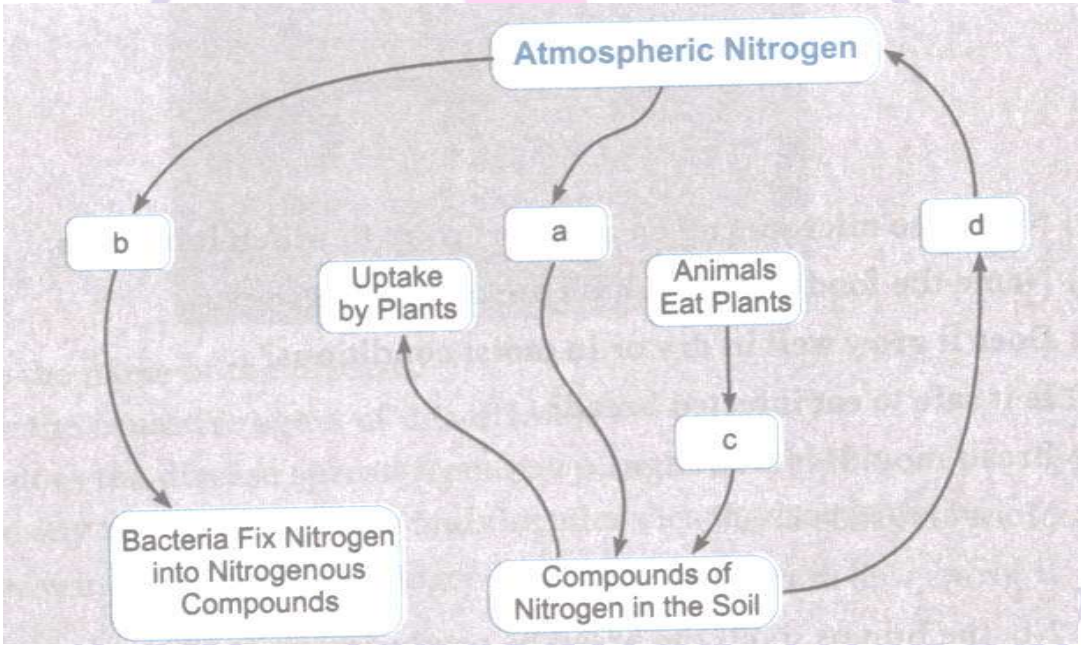
5. Complete the following cycle given below by filling the blanks (a),(b),(c), (d).

a. Lightning fixes nitrogen.

b. Nitrogen fixing bacteria and blue-green algae fix atmospheric nitrogen.

c. Nitrogenous waste from excretion and death.

d. Bacteria turn compounds of nitrogen into gaseous nitrogen.



I. High Order Thinking Skills (HOTS) Questions.

1. Preservatives are used in kitchen on daily basis. List a few of them.

Vinegar and oil are common preservatives, used in kitchens.

2. Should antibiotics be used in cold and flu? Give reasons for your answer.

No, antibiotics should not be used in cold and flu because these diseases are caused by viruses and antibiotics are not effective against viruses.

3. The process of heating milk to a high temperature and then cooling it quickly is given a particular name, what is it?

Heating milk to a high temperature and then cooling it quickly is called Pasteurization. By doing so, the growth of microbes is prevented.

4. Where do Rhizobium bacteria commonly live?

Rhizobium bacteria live in the root nodules of leguminous plants.

5. What do you mean by symbiotic relationship?

The relationship between two organisms in which both the organisms are benefitted is called symbiotic relationship.

6. How do micro-organisms survive under adverse conditions?

Under unfavourable conditions of temperature and water, they generally from a hard and tough covering called cyst. This protects them. When favourable conditions come, they emerge from their shell, multiply and go through their life cycle.

7. A person suffering from common cold sneezes, find droplets of moisture carrying thousands of viruses spreads in the air. Viruses enter the body of a healthy person while breathing. Give name of these types of diseases.

The microbial diseases that can spread from an infected person to a healthy person through air, water, food or physical contact are called communicable disease e.g., Common cold, cholera, TB etc.

8. A boy opened two packets of milo drink. He left one in the refrigerator and another on the table. Three days later,he got a bad smell from the packet left on the table. The packet of milo drink in the refrigerator did not have a bad smell. Why? Explain.

The packet which was put in the refrigerator did not have a bad smell because there was a cold temperature and bacteria cannot grow there. Decomposition by bacteria in the packet left on the table caused a bad smell.

II. High Order Thinking Skills (HOTS) Questions.

1. Paheli watched her grandmother making mango pickle. After she bottled the pickle, her grandmother poured oil on top of the pickle before. Closing the lid, paheli wanted to know why oil was poured, can you help her understand why?

Oil prevents bacteria from attacking the pickle and spoiling it.

2. What will happen if spoilt food is consumed?

Spoilt food contains microorganisms which produce toxic substances in our body when consumed. This leads to food poisoning.

3. Why does curd set faster in summers than in winters?

This is because in summers, the bacterium responsible for turning milk into curd lactobacillus, gets an optimum temperature for growth and thus multiplies faster.

Value Based Questions

1. Rahul came back from school and ate the rich that was kept outside on the dining table. After few hours, he complained of diarrhoea and abdominal pain. His mother took him to the doctor who explained why this happened and asked them to preserve their food properly.

i. What must have happened to Rahul?

ii. Give the probable cause for his condition.

iii. Mention the values shown by the doctor.

i. Rahul had food poisoning.

ii. It could be due to micro-organisms like fungi and bacteria that were present on uncovered rice.

iii. The doctor is helpful, considerate and intelligent.

2. Shikha while teaching her sister about microbes explained that microbes are useful to humans. Hearing this, her sister Sneha got confused as she knew that her Uncle was suffering from TB caused by microbes. She asked this to Shikha. Shikha appreciated Sneha was asking this question and explained her.

i. What are microbes?

ii. How are microbes helpful to humans?

iii. Mention two diseases other that TB caused by microbes.

iv. Identify the values shown by Sneha.

i. Organisms that cannot be seen with eyes alone or with naked eyes are called microbes.

ii. Microbes are useful to humans in many ways: They help in the production of curd, cheese, in cleaning the environment etc.

iii. Diseases caused by microbes are polio,

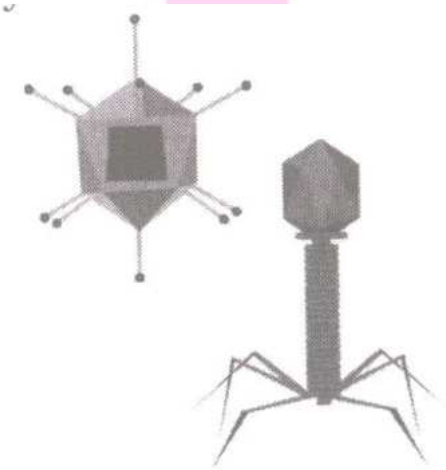
iv. Sneha is attentive, responsive and curious.

3. What is the importance of immunization in eradicating diseases from a country?

Immunization is the development of resistance against a pathogen. It is carried out through vaccination. Regular vaccination will eradicate diseases from a country. For example PPIP (Pulse Polio Immunization Programme). It is the largest public health programme launched in December 1995 in an attempt to eradicate polio from our country.

Skill Based Questions

1. Observe the following figure carefully and identify it. Name a common disease caused by it.



The given figures is of viruses.

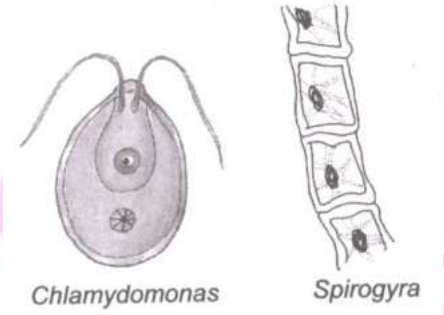
The most common disease caused by the virus is Polio.

2. Draw a diagram to show.

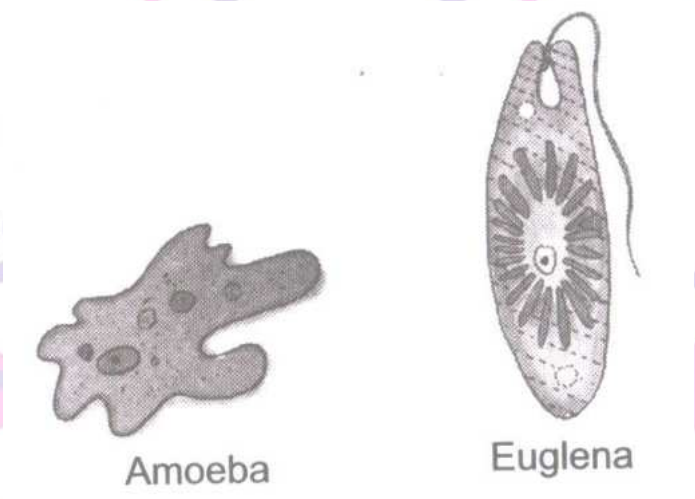
(i) Any two algae and name them.

(ii) Two protozoans and name them.

i.



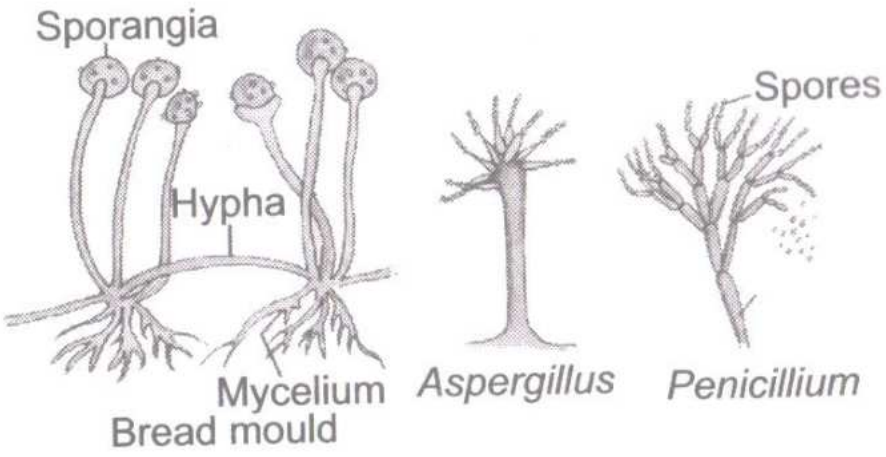
ii.



3. Draw a diagram of (i) Bread mould (ii) Penicillium (iii) Aspergillus

(a) Name the group to which above said microorganisms belong.

(b) Name the antibiotic prepared by penicillium.

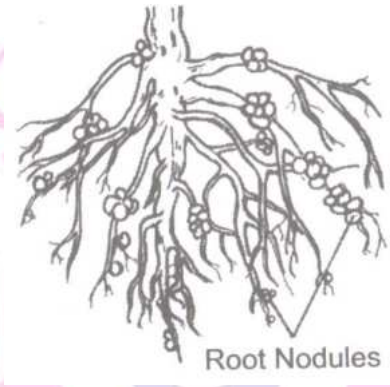


(a) Above shown microorganisms belong to fungi group.

(b) The antibiotic is Penicillin.

4. Draw a diagram of roots of legume plant with root nodules. Name the bacteria that live in these roots.

The bacteria that live in these roots are **Rhizobium**.



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