

Unit 2(Microorganisms Friend and Foe)

Multiple Choice Questions

Question. 1 Which of the following reproduces only inside a host cell?

- (a) Bacteria (b) Virus
(c) Amoeba (d) Fungus

Answer. (b) Virus is a micro organism, which is in an inactive or deal form outside the body of a host. It reproduces or replicates only when it enters a host and reaches its cells.

Question. 2 A disease in human beings caused by virus is

- (a) typhoid (b) influenza
(c) dysentery (d) cholera

Answer. (b) Influenza is an infectious disease caused by the influenza virus. It is also known as flu whose symptoms includes high fever, running nose, sore throat, headache, coughing and muscle pain etc. Typhoid, dysentery and cholera are bacterial infections.

Question. 3 Pathogenic micro organisms present in host cells are killed by medicines called

- (a) pain killer (b) antibodies
(c) antibiotics (d) vaccines

Answer. (c) Antibiotics are substances that may inhibit or kill the growth of different microbes. Micro organisms causing infection in host bodies are killed by consumption of these antibiotics.

Question. 4 The two micro organisms which live in symbiotic association in lichens are

- (a) fungus and protozoa (b) alga and bacteria
(c) bacteria and protozoa (d) alga and fungus

Answer. (d) Lichens is an association between a fungal and an algal species. It is mutually benefiting association where algae provides food to the tongue fungus return gets shelter from it.

Question. 5 The gas released during the preparation of bread is

- (a) oxygen (b) carbon dioxide
- (c) nitrogen (d) sulphur dioxide

Answer. (b) Carbon dioxide (CO₂) is released during the preparation of bread.

This is the process of fermentation in which yeast cells rapidly produces CO₂, which causes rising of the dough used in preparation of bread.

Question. 6 The disease caused by a protozoan and spread by an insect is

- (a) dengue (b) malaria
- (c) polio (d) measles

Answer. (b) Malaria is the disease which is caused by the spread of a protozoan, i.e. Plasmodium.

It is spread in healthy individuals by the bite of a female Anopheles mosquito carrying this Plasmodium in their mouth (saliva).

Question. 7 Paheli dug two pits, A and B, in her garden. In pit A, she put a polythene bag packet with some agricultural waste. In pit B, she dumped the same kind of waste but without packing it in a polythene bag. She, then covered both the pits with soil. What did she observe after a month?

- (a) Waste in pit A degraded faster than that in pit B
- (b) Waste in pit B degraded faster than that in pit A
- (c) Waste in both pits degraded almost equally
- (d) Waste in both pits did not degrade at all

Answer. (b) Waste in pit B degraded faster than that in pit A because packet B was kept open, so O₂ could go in which helped the microbes in decomposing the waste materials easily. In packet A, since it was sealed, O₂ could not enter and thus, microbial degradation did not occur.

Very Short Answer Type Questions

Question. 8 Unscramble the jumbled words underlined in the following statements.

- (a) Cells of our body produce santiidobe to fight pathogens.
- (b) Curbossulite is an air-borne disease caused by a bacterium.
- (c) Xanrhat is a dangerous bacterial disease.
- (d) Yeasts are used in the wine industry because of their property of meronettinaf.

Answer. (a) Antibodies are specific molecules produced against invading microbes.

(b) Tuberculosis is an infectious air-borne disease caused by Mycobacterium tuberculosis.

(c) Anthrax is an infectious disease of humans and animals caused by Bacillus anthracis.

(d) Fermentation is a process occurring in yeast which converts sugar into gases (CO₂) and alcohols.

Question. 9 Suggest a suitable word for each of the following statements.

- (a) Chemicals added to food to prevent growth of micro organisms.
- (b) Nitrogen-fixing micro organism 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.

Answer. (a) Preservatives are the chemicals added in food. They prevent microbial infection without altering the taste or appearance.

(b) Rhizobium are the nitrogen fixing bacteria which fix the atmospheric nitrogen into that form (i.e. nitrates, nitrites) which is usable for plants.

(c) Carrier/Vector are the modes of transmission of a disease.

(d) Antibiotics are the antimicrobial agents for inhibiting or killing the growth of microbes.

Question. 10 Match the names of scientists given in Column I with the discovery made by them given in Column II.

Column I	Column II
(a) Louis Pasteur	(i) Penicillin
(b) Robert Koch	(ii) Anthrax bacterium
(c) Edward Jenner	(iii) Fermentation
(d) Alexander Fleming	(iv) Smallpox vaccine
	(v) Typhoid

Answer. The correct matching is as given:

(a) –(iii), (b)–(ii), (c)–(iv), (d)–(i)

(a) Louis Pasteur discovered fermentation in 1857 by demonstrating that microbes cause souring of milk.

(b) Robert Koch is known for his role in identification of the causing agent of anthrax.

(c) Edward Jenner is known as father of Immunology. He discovered the vaccine for smallpox in 1798.

(d) Alexander Fleming discovered penicillin antibiotic, which is used extensively in treatment of various diseases.

Question. 11 Name one commercial use of yeast.

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

Question. 12 Name the process in yeast that converts sugars into alcohol.

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

Question. 13 Preservatives are used in kitchen on daily basis. List a few of them.

Preservatives prevent the spoilage of food lives for a long time from microbial infestation.

Answer. Vinegar common salt and oil are common preservatives used in kitchen.

Question. 14 Why should we avoid standing close to a tuberculosis patient while he/she is coughing?

Answer. Tuberculosis is an air-borne disease, which is easily spreads when the infected person coughs. As coughing spreads germs in the air and these germs remain suspended in air until inhaled by person present in promixity of the patient who is suffering from the disease. That is why we should avoid standing close to a TB patient.

Question. 15 Polio drops are not given to children suffering from diarrhoea. Why?

Answer. If the child is suffering from diarrhoea, the polio drops that is an oral vaccine for fighting against polio virus may be excreted out because of frequent motions.

Thus, the child becomes susceptible to polio inaction as the vaccine becomes ineffective to fight against invading pathogen.

Question. 16 Paheli watched 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?

Answer. The oil poured on the pickle forms a barrier between the pickle and air. This prevents the bacteria present in air from entering jar and attacking the pickle and spoiling it. Thus, increasing the shelf life of pickles.

Short Answer Type Questions

Question. 17 Match the micro organisms given in the Column I to the group to which they belong in Column II.

Column I	Column II
(a) <i>Lactobacillus</i>	(i) Algae
(b) <i>Aspergillus</i>	(ii) Protozoa
(c) <i>Spirogyra</i>	(iii) Fungi
(d) <i>Paramecium</i>	(iv) Bacteria

Answer. The correct matching is as given:

(a) —(iv), (b)—(iii), (c)—(i), (d)—(ii)

(a) *Lactobacillus* is a bacteria, which causes the formation of curd from milk.

(b) *Aspergillus* is a fungi from which penicillin antibiotic is extracted, i.e. *A. niger*.

(c) *Spirogyra* is a filamentous green spiral in shape, growing as green slimy mats on surface of water bodies.

(d) *Paramecium* is a unicellular organism, a protozoan found in water bodies.

Question. 18 Classify the following into friendly and harmful micro organisms. Yeast, malarial parasite, *Lactobacillus*, bread mould, *Rhizobium*, *Bacillus anthracis*.

Answer. Friendly micro organisms The microbes which benefit humans and other organisms in one way or the other are considered as friendly microbes.

Yeast	used in food industry where fermentation is required like bread making or wine and beer industries.
<i>Lactobacillus</i>	used in curd formation
<i>Rhizobium</i>	helps in fixing atmospheric nitrogen, increasing soil fertility. It is formed in the roots of leguminous plants.

Harmful microorganisms

Malarial parasite	cause malaria in host bodies.
Bread mould	spoils bread
<i>Bacillus anthracis</i>	causes anthrax, a highly infectious respiratory disease.

Question. 19 While returning from the school, Boojho ate chaat from a street hawker. When he reached home, he felt ill and complained of stomachache and fell ill. What could be the reason?

Answer. The reason could be that the chaat was contaminated by pathogenic micro organisms. The unhygienic conditions present near the shop becomes the breeding place for microbes, flies, etc.

The pathogens can be transmitted to places by flies and other vectors, even the utensil used for serving could have been contaminated by the pathogenic micro organism. If such microbial contaminated food is consumed several disease like diarrhoea, dysentery, cholera, etc., may occur.

Question. 20 What will happen to 'pooris' and 'unused kneaded flour' if they are left in the open for a day or two?

Answer. The 'unused kneaded flour' if left in warm conditions, gets infected by microbes which causes fermentation and spoils the flavour, texture, etc., of the flour. The pooris would remain in relatively good condition because these were deep fried in heated oil that kills microbes.

Question. 21 (a) Name two diseases that are caused by virus.

(b) Write one important characteristic of virus.

Answer. (a) Influenza and chickenpox are two diseases caused by virus in humans.
(b) Virus are dead when present in the environment. They can reproduce only inside the cells of an infected person (as host).

Long Answer Type Questions

Question. 22 Observe the figure and answer the questions that follows.

- Write the name of the disease.
- Name the causative agent of this disease?
- How does the disease spread from one plant to another?
- Name any two plant diseases and the microbes that cause them.



Answer. (a) The disease is yellow vein mosaic of the lady's finger/okra. The disease is characterised by alternating green and yellow patches and chlorosis in veins. Severity of disease leads to complete yellowing of leaves.

(b) Bhindi yellow vein mosaic virus.

(c) The disease transmission occurs via the insects sitting on anther of diseased plant and moving to others,

(d) Plant disease occurring commonly are:

- Common rust *Puccinia graminis* (fungus) brown pustules which can be • elongated or ovule develops on both the leaf surfaces. On rupturing they release spores.
- Citrus canker *Xanthomonas* spp (bacteria) lesions on leaves, stems and fruits of citrus trees which fruit and leaves drops prematurely from trees.

Question. 23 How do vaccines work?

Answer. Vaccines contain dead or weakened microbial strains of a particular disease. When a vaccine is introduced into a healthy body. It produces specific cells against the pathogen.

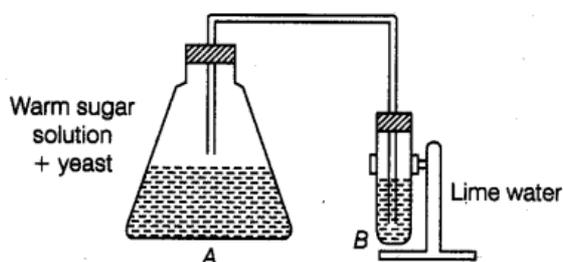
These cells, are called antibodies and they becomes active when the pathogen attack our body. The body fights and kills them by producing specific set of reactions.

These antibodies remain in the body for life long and protect against the microbe when microbe enters the body again.

Vaccines can be given either orally (in the forms of drops) or injected in the body.

Question. 24 Observe the set-up given in figure and answer the following questions.

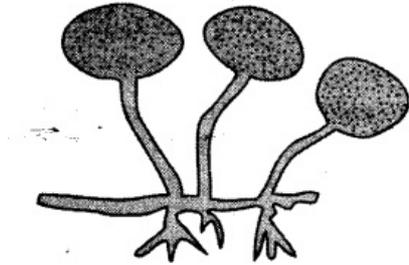
- What happens to the sugar solution in A?
- Which gas is released in A?
- What changes will you observe in B when the released gas passes through it?



Answer.

1. Yeast grow very rapidly on the sugar containing substrates. It multiplies and increases its number and in process converts the sugar into alcoholic products with the release of CO_2 gas.
In flask A, fermentation is occurring due to the presence of yeast and its utilisation of sugar.
2. Carbon dioxide is released in A during fermentation process.
3. The gas released due to the fermentation of sugar in set up is CO_2 . When CO_2 is passed over lime water in set up S its color changes, i.e. the lime water turns milky.

Question. 25 Observe the figure and answer the following questions.



1. Name the microorganism and the group to which it belongs.
2. Name the food item on which the organism grows.
3. Does it grow well in dry or in moist conditions?
4. Is it safe to eat infected bread?

Answer.

1. The microorganism is Rhizopus, also known as the bread mould. It belongs to the microbial group of fungi.
2. The Rhizopus grows well on moist and stale bread.
3. This organism grows well in moist conditions. Dry conditions inhibit its growth.
4. No, Intake of fungus infected bread can cause harm by producing poisonous chemicals or toxins which adversely effects the proper functioning of our body.

Question. 26 Give reasons for the following.

1. Fresh milk is boiled before consumption while processed milk is stored in packets and can be consumed without boiling.
2. Raw vegetables and fruits are kept in refrigerators, whereas jams and pickles can be kept outside.
3. Farmers prefer to grow beans and peas in nitrogen deficient soils.
4. Mosquitoes can be controlled by preventing stagnation of water though they do not live in water. Why?

Answer.

1. Fresh milk is boiled before consumption to kill the micro organisms that could be present in it. But packed milk is pasteurised and boiled at 70°C for 30 sec followed by sudden chilling then stored.
Thus, it can be consumed without boiling. Pasteurisation kill all micro organisms for making it free of any contamination.
2. Raw vegetables and fruits get easily infected by micro organisms and get spoiled. They are kept in refrigerator at low temperature that inhibits growth of microbes. Jams and pickles contain sugar and salt as preservatives.
These preservatives forms a protective layer and prevent spoilage of these products by inhibiting the growth of various micro organisms.

- Beans and peas are leguminous plants as they have Rhizobium, a bacteria in their root nodules. This bacteria can fix atmospheric nitrogen to enrich the soil with nitrogen and increase its fertility.

Farmers grow leguminous plants in between the major crops, a practice called crop rotation to restore the used nutrients of the soil.

- Though mosquitoes, live on land, water is their breeding ground their larvae grow in water. Water stagnation is collecting of water in a small area, without any activity. Mosquitoes lay egg on such a surface.

If water stagnation is prevented, their larvae cannot survive, thus reducing mosquito population.

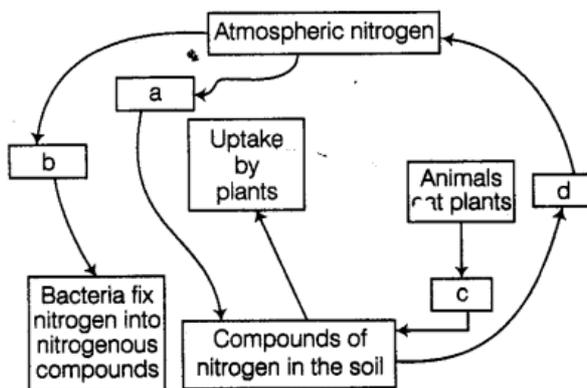
Question. 27 How can we prevent the following diseases?

- Cholera**
- Typhoid**
- Hepatitis-A**

Answer.

- Cholera An infectious disease caused by bacteria *Vibrio cholerae*. It occurs due to the consumption of contaminated or unhygienic food and water. It can be prevented by maintaining personal hygiene, good sanitation practice, consumption of clean drinking water, etc.
- Typhoid An acute illness caused by bacteria *Salmonella typhi*. It occurs by ingestion of typhoid bacterium through food, water, fomite, etc. Preventions includes consumption of hygiene and properly cooked meals, filtered or boiled water, etc.
- Hepatitis-A A disease caused by hepatitis. A virus. Symptoms of disease appears after 2 weeks of infection. Prevention includes proper vaccinasation drinking boiled water, wash hands before eating, etc.

Question. 28 Complete the following cycle given as figure by filling the boxes (1), (2),(3), (4).



Answer. The cycle given above represents the nitrogen cycle occurring in the environment. The atmospheric nitrogen cannot be up taken by plants and animals as such, this is corrected by some bacteria and blue-green algae present in the soil. These microbes fix the atmospheric nitrogen into usable components which are utilised by other living 'organisms. Nitrogen cycle checks the percentage of nitrogen in the atmosphere and maintains it at a constant level.

- Lightning fixes nitrogen.
- Nitrogen fixing bacteria and blue-green algae fix atmospheric nitrogen.
- Nitrogenous waste from excretion and death.
- Bacteria turns compounds of nitrogen into gaseous nitrogen.