Lesson no 8
Useful and Harmful Microbes - Extra questions

Q.1 Which plants are used for industrial production of ethanol?
Ans.- Sugarcane, Maize, Barley and other grains are used for industrial production of ethanol.

Q.2 What is the process to convert milk into yoghurt?
Ans.- The bacteria that convert lactose sugar in the milk to lactic acid by the process of fermentation is Lactobacilli. Hence the pH of milk decreases and become acidic. This results in coagulation of milk proteins are separated from other constituents of the milk, causing milk to convert into yoghurt. Due to lactic acid yoghurt tastes sour. The other harmful bacteria in the milk destroys the low pH.

Q.3 How is Rhizobium useful to farmers ?
Ans.- As the use of Rhizobium is increased, the chemical fertilizers are used less. Hence, the bad effects of chemical fertilizers are reduced. Due to use of Rhizobial cultures, the expenses, on the chemical fertilizers is reduced. Beans and pulses grown on the plants with use of Rhizobial cultures are rich in proteins due to nitrogenous compounds made available by Rhizobia.

Q.4 What is Rhizobial inoculation ?
Ans.- Before sowing the seeds, they are coated with Rhizobial solution, When these seeds are sowed, the Rhizobia enter the plantlets. This is called Rhizobial inoculation.

Q.5 Which are the diseases spread through pathogen fungi ? State their mode of infection and preventive measures.
Ans.- The diseases spread through pathogen fungi are dandruff, ringworm, scabies. If the infected person comes in contact, or in belongings like clothes, or used things then these diseases spread, to prevent these diseases, one should maintain personal hygiene, and avoid contact with infected person.

Q.6 How is vaccine produced ?
Ans.- Injecting the dead or weakened forms of a pathogen to help stimulate resistance mechanism, before an actual attack of the disease.

Q.7 Name the milk products, that are obtained at home by fermentation of cream from the milk ?
Ans.- Yoghurt, ghee, buttermilk, shrikhand etc.

Q.8 What is the use of adding 10% ethanol with fuels like petrol and diesel ?
Ans.- Ethanol does not produce smoke. It is also inflammable fuel, and combustible. It produces a blue flame when burnt. It is colorless, liquid and has pleasant odour. It is also obtained from fermentation of sugarcane molasses.

Q.9 What are the preservatives mixed with ready to eat foods to prevent them spoiling ?
Ans.- Sodium, benzoate, vinegar, citric acid, sodium meta sulphate are the preservatives, that are mixed with ready to eat foods to prevent them spoiling.

Q.10 Which process converts milk into yoghurt ?
Ans.- Fermentation is the process that convert milk into yoghurt. Fermentation is a bio chemical process in which carbohydrates are broken down by micro-organisms in absence of oxygen. When yoghurt is prepared, carbohydrates that is lactose sugar is present in milk is converted into lactic acid.

Q.11 What is Probiotic yoghurt ?
Ans.- Probiotic yoghurt are prepared using useful microbes as lactobacilli that are healthy for body. Some harmful bacteria example clostridium, that are present in the alimentary canal. These are helpful to improve our immunity.

Q.12 Write a note on clostridium.
Ans.- Clostridium bacteria spoil food. This bacteria has 100 different species. Some of them are free living in the soil, while some live in the alimentary canals of the humans and other animals. The shape of this bacteria is rod like, and produce bottle shaped endospores in different conditions. These bacteria grow in anaerobic conditions. Hence, these bacteria cannot withstand the normal oxygen level of the air.

Q.13 Write the causative pathogen, mode of infection and preventive measure of AIDS.
Ans.- The causative pathogen is virus. The mode of infection is through blood and semen of infected person, or milk of mother suffering from AIDS. Preventive measure is safe sexual contact, avoid reuse of needles and injections.

Q.14 Write down the modes of infection and preventive measures against pneumonia.

Ans.- Mode of infection - Droplets spread in air by infected person. Preventive measures - Vaccination, avoiding contact with infected person.

Q.15 What are the uses of Lactobacilli.

Ans.- 1) Fermentation of milk is done by using lactobacilli for preparing milk products as buttermilk, yoghurt, ghee, cheese etc. 2) Lactobacilli fermentation is useful for cider, cocoa, vegetable pickles etc. 3) For abdominal discomfort, lactobacilli and other useful microbes are taken together. 4) Leavened fodder is fermented using lactobacilli and given to domestic cattle.

Q.16 Why is yeast used in making wine ?

Ans.- Wine is prepared by fermentation process by using yeast, fermentation occurs to sugars present in grapes such as glucose and fructose. This results in production of alcohol, used in making wine.

Q.17 Write a note on antibiotics.

Ans.- The meaning of antibiotics is, carbon compounds that are obtained from some bacteria and fungi for destroying or preventing the growth of harmful micro-organisms. Antibiotics mainly act against bacteria, however some can destroy protozoa. Some antibiotics are useful against a wide variety of bacteria (broad spectrum antibiotics) e.g. Ampicilin, amoxicilin, tetracycline etc.

Q.18 What are the mode of infection and preventive measures for Hepatitis ?
Ans.- Mode of infection - Contaminated water and food. Preventive measure - Use clean and filtered water, proper storage of food.

Q.19 What are the mode of infection and preventive measures for Influenza.
Ans.- Mode of infection - Contact with infected person. Preventive measure - Personal hygiene and avoiding contact with infected person.

Q.20 Lactobacilli are used for making yoghurt from milk.
Ans.- Lactobacilli convert lactose, the sugar in milk, into the lactic acid. This is fermentation process. The pH of milk decreases, that causes coagulation of milk proteins. Hence, milk proteins are separated from other constituents of milk, and milk changes in yoghurt. Due to lactic acid, yoghurt has specific sour taste. The low ph destroys harmful microbes present in the milk. Hence, lactobacilli are used for making yoghurt from milk.

Q.21 Food on which fungi is grown cannot be eaten.
Ans.- Different types of fungi grow on food items like pickles, murabba, jam, sauce, chutney etc. They use the nutrients in food items for growth and reproduction. In this process, fungi release mycotoxins, poisonous chemicals, into the food which makes the food poisonous. Hence, the food cannot be eaten.

Q.22 How are antibiotics helpful to cure diseases ?
Ans.- Antibiotics destroy or prevent the growth of harmful micro-organisms and cure diseases.

Q.23 Antibiotics should be taken only when prescribed by doctor.

Ans.- Antibiotics are the medicines that kill bacteria and protozoa. Doctors understand the disease very well and select the most appropriate antibiotic. If antibiotics are consumed in extra amount than required, they kill the useful bacteria in the body. If the course of antibiotics remain incomplete, the bacteria develop resistance, to that antibiotic making it ineffective. Hence, antibiotic should be taken only when prescribed by doctor.

Q.24 Explain the concept of symbiosis, give example.

Ans.- The meaning of symbiosis is mutually beneficial relationship. Example Rhizobium. It is living in root nodules of leguminous plants supply nitrates, nitrites and amino acids to that plant and in exchange get energy in the form of carbohydrates.

Q.25 Give reason for the following- Beans and pulses are a rich source in proteins.

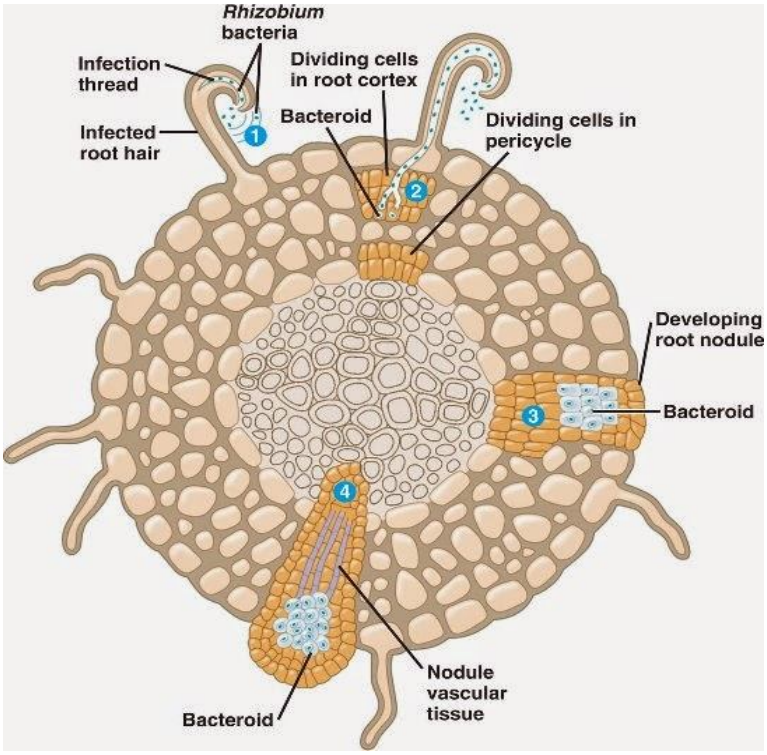
Ans.- Beans and pulses are leguminous plants. Rhizobia present in the root nodules, of Beans and pulses produce nitrogenous compounds from the atmospheric nitrogen. Hence, Beans and pulses are rich in proteins due to the nitrogenous compounds made available by rhizobia.

Q.26 How can you observe microbes ?

Ans.- Microbes can be observed using microscope.

Q.27 Draw a neat labeled diagram the T.S. of root nodule of soybean plant showing infection by rhizobia.

Ans.-



Root nodules of soybean plants

Q.28 Naphthalene balls are kept in clothes Give reason.

Ans.- Naphthalene is an antimicrobial agent. It contain toxic chemicals, it prevents the growth of fungi and bacteria, silverfish or termites growth on clothes gets prevented. It is a strong insect repellent due to its strong odour. Hence if Napthalene balls are kept in clothes, it prevents unwanted bacterial and microbial growth.

Q.29 Which are the fungi diseases caused in animals.

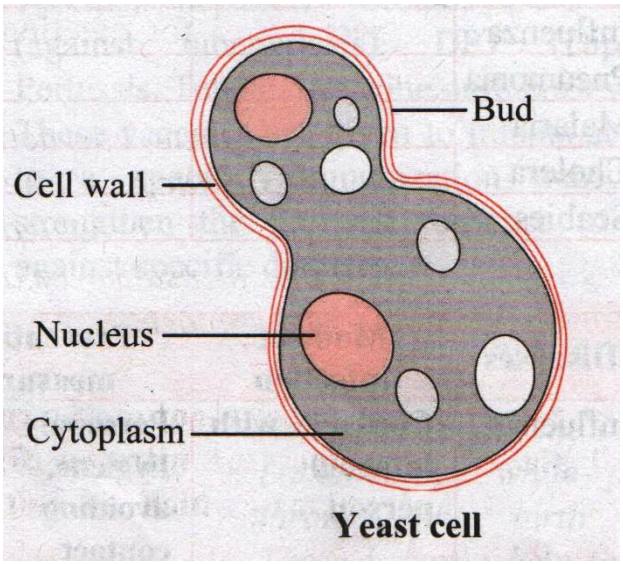
Ans.- Ringworm, actinomycosis, aspergillosis, candidiosis.

Q.30 Write the examples of different species of Clostridia.

Ans.- 1) Clostridium tetani 2) Clostridium perfringens
3) Clostridium botulinum 4) Clostridium difficile.

Q.31 Write a note on yeast cell.

Ans.- Yeast is a unicellular fungus, and is eukaryotic. They are oval in structure and do not have any colour. Some of these cells have small round bodies attached to them. They have asexual method of reproduction called budding. Yeast is a heterotrophic fungal microbe that grows on carbon compounds.



Q.32 Are the antibiotics given to animals and human same ? why ?

Ans.- 1) Antibiotics act against micro organisms and bacteria. Antibiotics are given for precautions against diseases. 2) Many of the antibiotics are same for human and animals. 3) Many of the antibiotics are made from fungi. Depending on the disease causing pathogen, the antibiotics are prescribed. 4) Antibiotics can be used during epidermal conditions. It can be used by animals and humans. If the pathogens causing diseases in animals are different, from those causing in humans, then antibiotics may differ.

Q.33 Describe the characteristics of clostridium bacteria.
Ans.- They cannot withstand the normal oxygen level of the air as they grow in anaerobic conditions.

Q.34 What are the uses of fungi to plants.
Ans.- 1) Certain fungi live around the roots of plants. e.g. The group of fungi called Mycorrhizia. They extract the sugar that they need from the plants, and in return fungi provide minerals and water from soil to the plants. Hence, fungi and the host plant have a symbiotic relationship. Some plants are totally dependent on fungus associated with their roots for growth. e.g. orchids.
2) Fungi growing on the fallen leaves detoxify them, that makes it safe for grazing animals that feed on those plants.
3) A group of fungi called chytrids live symbiotically in the rumen of the moose.
4) Certain species of wood wasps and some other insects lay eggs in the fungal bodies of growing trees. The developing larvae feed on the trees.
5) Some ants grow fungi in their anthill to grow food from it.

Q.35 Which preservatives are mixed with ready to eat foods to prevent them from spoiling ?
Ans.- 1) BHT (Butylated. hydroxytoluene)
2) BHA (Butylated hydroxyanisole)
3) Sodium nitrite
4) Sulphites
5) Monosodium glutamate
6) Sodium Benzoate.

Q.36 What is probiotics? Why are they healthy?
Ans.- The useful bacteria such as Lactobacilli are added to the eatables are made healthy by adding such useful bacteria. The eatables which are of probiotic type are healthy because they kill the harmful bacteria like Clostridium which may be present in the alimentary canal. They are also helpful to improve immunity.

Q.37 Which are the diseases transmitted through the mosquito bites ?
Ans.- Malaria, Dengue.

Q.38 Write the name of pathogen, mode of infection and also preventive measures for Bird flu, Swine flu.
Ans.- Bird flu, Swine flu
Pathogen - Virus
Mode of infection - Contact with infected Birds and animals.
Preventive measures - Personal Hygiene, Properly cooked meat.

Q.39 Name the institute in India that undertakes the research related to viral diseases. Where is it located ?
Ans.- The National Institute of Virology perform the research related to viral diseases, it is in Pune. It carries research related to measles, jaundice, fever and diseases of lungs. WHO supports their work.

Q.40 Write a note on Alexander Fleming.

Ans.- Sir Alexander Fleming was born on 6 August 1881, Scotland. He was Scottish bacteriologist best known for discovery of Penicillin, in 1928. He discovered Penicillium fungus while observing staphylococci, cultures. The Penicillin is the first antibiotic in the world. Incurable diseases are covered due to antibiotics.

Q.41 Which scientist discovered that anaerobic bacterium clostridium Botulinum is responsible for food poisoning ?
Ans.- Van Ermengem.

Q.42 What are Mycotoxins ?
Ans.- Mycotoxins are the poisonous chemicals released into the food by fungi. Different species of fungi secrete Mycotoxins that are toxic and harmful substances. This secretion makes the food poisonous. The harmful toxins are released when the fungal hyphae absorb the nutrients from food materials.

Q.43 What is Bio - remediation ?
Ans.- 1) Bio remediation is technique to use bacteria to absorb toxins and breakdown the environmental pollutants.
2) Fungi and yeast are used for Bio remediation.
3) Yarrowia lipolytica absorb the toxins during production of oil, heavy metals and other processes. e.g. Saccharomyces cerevisae, absorbs pollutant arsenic.

Q.44 Which bacteria is used for cleaning oil spills in the oceans?
Ans.- Alcanivorax.

Q.45 Write the mode of infection and preventive measure for leprosy.

Ans.- Mode of infection - Long term contact with the infected person.
Preventive measures - Avoiding contact with the infected person and their belongings.

Q.46 Write a note on Fermentation.
Ans.- 1) Yeast uses sugar for food.
2) It quickly grows and multiplies due to the carbon compounds.
3) To obtain nutrition, Yeast cells convert carbohydrates into food into alcohol and carbon dioxide.
4) This process is fermentation.

Q.47 Which bacteria is responsible for gas gangrene.
Ans.- Clostridium perfringens.

Q.48 Name the yeast used in fermentation of molasses.
Ans.- Saccharomyces

Q.49 What are broad spectrum antibiotics.
Ans.- 1) Antibiotics are carbon compounds obtained from some bacteria or fungi for destroying or preventing the growth of harmful micro organism.
2) Some antibiotics destroy protozoa, they act against bacteria.
3) The antibiotics that are useful against wide variety of bacteria are called broad spectrum antibiotics.
4) They are used when pathogen cannot be identified even when symptoms of disease are visible.

Q.50 Match the pairs -

Group A	Group B
1) Clostridium	1) Contaminated water and food
2) Rhizobium	2) Production of antibiotics.
3) Penicillin	3) Nitrogen fixation
4) Hepatitis	4) Food poisoning

Ans. -

Group A	Group B
1) Clostridium	1) Food poisoning
2) Rhizobium	2) Nitrogen fixation
3) Penicillin	3) Production of antibiotics.
4) Hepatitis	4) Contaminated water and food