**APPLIED MICROBIOLOGY**

**TWO MARKS - UNIT (1-5)**

**UNIT-1**

1. **Define fermentation.**

 The anaerobic enzymatic conversion of organic compound, especially carbohydrate to simpler compound, especially alcohol, producing energy in the form of ATP is called fermentation.

 **2. State any two-strain improvement method.**

* + - Role of plasmid
		- Protoplast fusion

 **3. Write the components of medium.**

Carbon source, nitrogen source, growth factor, buffering agent, mineral elements

 **4. What are known as antifoam agents?**

* Antifoams or defoamers are added to control foam formation during fermentation.
* Defoamers (e.g. Oil mixed with octadecanol for penicillin fermentation) should be used for controlling foams.

 **5. What is meant by sterilization?**

 Sterilization is the destruction and removal of microbes which would interfere with the fermentation process.

 **6. Define isolation of strain.**

 The process of screening pure culture by separating one type of microbes from a mixture is called isolation.

 **7. What is pure culture?**

 A culture containing only one type of microbe is called pure culture.

**UNIT-2**

**1. What is chemolithotrophs?**

A chemolithotroph is an organism that is able to use inorganic compounds as a source of energy. This mode of metabolism is known as chemolithotrophy.

**2. Define photosynthesis.**

The photosynthesis is a process by which green plants and some other autotropic organisms use sunlight to synthesis nutrients from carbon dioxide and water with the help of chlorophyll in green plants and bacteriophyll in bacteria. In this process light energy is converted into chemical energy.

**3. Define alkanes.**

Alkanes are acyclic unsaturated hydrocarbons that consist of carbon and hydrogen atoms. the chemical structure of alkanes only consists of single bond. General chemical formula of alkane is CnH2n+2.

**4. Define aromatic compound.**

Aromatic compounds are substances that consist of one or more rings that contain alternating single and double bonds in its chemical structure. They are cyclic compounds.

**5. Define hydrocarbons.**

 Hydrocarbon is an organic compound consisting entirely of hydrogen and carbon. Hydrocarbons are the principal constituent of petroleum and natural gas.

**6. What is energy?**

Energy is defined as the ability or capacity to do work. There are various types of energy.

**7. Define inorganic compound.**

 An inorganic compound is typically a chemical compound that lacks carbon-hydrogen bond [C-H bond], that is a compound not organic.

**8. What is visible radiation?**

 Visible radiation is a form of electromagnetic [EM] radiation, as are radio waves, infra-red radiation, UV radiation, X-rays and microwaves. Generally visible light is defined as the wavelengths that are visible to most human eyes.

**9. Define endogenous reserve polymers.**

The majority of microorganisms are able to survive, often for long period of time, when totally deprived of exogeneous nutrients. These organisms use reserve materials that is defined as polymers synthesized when an energy source is supplied in excess, and uses as a substrate for endogenous metabolism, without any cellular functions.

**UNIT-3**

**1. Define food poisoning (or) food borne disease (or) food borne illness.**

The illness resulting from eating food contaminated by disease causing microorganisms is called food poisoning (or) food borne disease.

**2. Define food preservation.**

 Food preservation is the process of treating and handling food to stop or slow down food spoilage, loss of quality, edibility or nutritional value and thus allow for longer food storage. Preservation usually involves preventing the growth of microorganisms.

**3. Define asepsis.**

 The state of being free from disease causing microorganisms [i.e. keeping out of microorganisms] is called asepsis.

**4. Define canning.**

* + - It is one the food preservation technique.
		- Canning involves the application of temperature to food that are high enough to destroy essentially all microorganisms present plus air tight sealing in sterilized containers to prevent recontamination.

**5. Define drying.**

Food drying is the method of preservation in which food is dried [dehydrated]. Drying inhibit the growth of bacteria, yeast, mold through the removal of water.

**6. What are the process are used to preserve food?**

* + - Preservation by high temperature.
		- Preservation by low temperature.
		- Preservation by chemical preservatives.
		- Preservation by osmosis.
		- Preservation by dehydration.
		- Preservation by fermentation.

**UNIT-4**

**1. Define disease.**

 A disease is a particular abnormal condition that negatively affects the structure or function of all or part of an organism, and that is not due to any intermediate external injury. Diseases are often known to be medical conditions that are associated with specific symptoms and signs.

**2. Define bacterial disease.**

 Bacterial disease includes any type of illness caused by bacteria. Harmful bacteria may also emit toxins that damage the body. Common pathogenic bacteria and the types of bacterial diseases they cause include: Escherichia coli and salmonella cause food poisoning.

**3. Define viral disease.**

 Viral disease or viral infection occurs when an organism’s body is invaded by pathogenic viruses, and infectious virus particles[virions] attach to and enter susceptible cells and multiply within them.

**4. Define fungal disease.**

 Fungal disease is often caused by fungi that are common in the environment. Most fungi are not dangerous, but some types can be harmful to health. Mild fungal skin disease can look like a rash and very common. Fungal disease in the lungs is often similar to other illness such as that flu and tuberculosis.

**5. Define protozoan infection.**

 Protozoan infections are responsible for diseases that affect many different types of organisms including plants, animals and some marine life. Many of the most prevalent and deadly human disease are caused by a protozoan infection, including African sleeping sickness, amoebic dysentery and malaria.

**6. Define host pathogen interaction.**

 It is defined as how microbes or viruses sustain themselves within host organisms on a molecular, cellular, organismal or population level. This term is most commonly used to refer disease causing microorganisms although they may not cause illness in all host.

**7. Define sample collection.**

Sample collection is the process obtaining tissues or fluids for laboratory analysis or near patients testing is often a first step in determining diagnosis and treatment.

**8. Define laboratory diagnosis of disease.**

Laboratory tests may identify organisms directly [e.g. visually, using a microscope, growing the organisms in culture] or indirectly [e.g. identifying antibodies to the organisms]. General types of test include microscopy, culture.

**9. Define antibiogram.**

 Antibiograms are tables showing how susceptible a series of organisms are to different antimicrobials.

**10. Define staphylococcus aureus**

 Staphylococcus aureus is a gram positive, round shaped bacterium found on the skin and in the nasal passages of about a quarter of humans. It is a facultative anaerobe, meaning it can produce energy [and thus survive] either in the presence of oxygen.

**11. What is mycoplasma?**

 Mycoplasma species are the smallest free-living organisms. These organisms are unique among prokaryotes in that they lack a cell wall around their cell membrane.

**12. Define hepatitis.**

 Hepatitis refers to the inflammatory condition of the liver. It results from a variety of causes, both infectious and non-infectious. Infectious agents that causes hepatitis includes viruses and parasites. Non infections cause includes certain drugs and toxic agents. In some instances, hepatitis result from an autoimmune reaction directed against the liver cell of the body.

**UNIT-5**

**1. Define environment.**

 The circumstances, object or condition by which one is surround. The complex of physical, chemical and biotic factors such as climate, soil and living things that act upon an organism or ecological community and ultimately determine its form and survival.

**2. Define waste management.**

 Waste management is the collection, transportation and disposal of garbage, sewage and other waste products. Waste management is the process of treating solid wastes and offers variety of solutions for recycling items that don’t belong to trash.

**3. Define waste water treatment.**

Waste water treatment is the process used to remove contaminants from waste water or sewage and convert it into an effluent that can be returned to the water cycle with minimal impact on environment, or directly reused. The latter is called water reclamation because treated waste water can be used for other purposes.

**4. Define sedimentation.**

The separation of solid suspended particles from sewage is called sedimentation. The tank is often referred to as sedimentation tank or settling tank. Sedimentation prevents sludge formation in the treatment unit.

**5. Define screening.**

 It is the first step of the sewage treatment. The sewage is passed through the screen fitted in the opening. Usually screens of uniform size are used for screening. The screening of sewage protects the operation unit from the excessive dumping of solid wastes.

**6. What is compost?**

 Compost is the decayed, humus like organic matter that contains simple organic substances. It is added to the soil for increasing its fertility. Generally, compost rich in animal excreta is used to fertilize the soil.

**7. What is biogas?**

Biogas is the mixture gases produced by the breakdown of organic matter in the absence of oxygen[anaerobically], primarily consisting of methane and carbon dioxide. Biogas can be produced from raw materials such as agricultural wastes, manure, municipal waste, plant materials, sewage, green wastes or food wastes.

**8. Define bioleaching.**

 Leaching is the solubilisation of metals from ores. As microorganisms are employed to solubilize metals, it is popularly called bioleaching or biological mineral leaching. It is one of the applications of bio hydrometallurgy.

**9. Define bioreactors.**

 An apparatus such as large fermentation chamber, for growing organisms such as bacteria or yeast under controlled conditions. Bioreactors are used in the biotechnological production of substances such as pharmaceuticals, antibodies, or vaccine, or for the bioconversion of organic waste.

**10. What are bio fertilizers?**

 A bio fertilizer is a substance which contains living microorganisms which, when applied to seeds, plant surfaces, or soil, colonize the rhizosphere or the interior of the plant and promotes the growth by increasing the supply or availability of primary nutrients to the host plant.

**11. What is superbug?**

 Superbug is a constructed bacterium. Pseudomonas putida that can degrade hydrocarbons found in petroleum wastes. It is a multiplasmid strain developed by using genetic engineering technique. It was developed by Anand chakrabarty.

**12. Define bio pesticides.**

Bio pesticides are certain types of pesticides derived from such natural materials as animals, plants, bacteria and certain minerals. Bio pesticides are used as safer alternatives to controlling pests.

**13. Define flac.**

 They react with the colloidal particles and form a gelatinous precipitate called flac.

**14. What is bioremediation?**

 Bioremediation is the cleaning up of toxic contaminants in the environment using the activity of natural microbial populations in the contaminants or other wastes.

**15. Define insitu bioremediation.**

 The removal of oil contaminants naturally from the soil by adding enough nutrients to soil is called in situ bioremediation.

**16. What is phytoremediation?**

 The use of natural or transgenic plants for environmental clean-up is called phytoremediation.