**Dental Technology 4th Semester ( Mid Term )**

**Paper: Medical Microbiology ( Sir, Muhammad Sohail )**

**Student: Name: Sabila**

**Student ID: 15248**

**Q.NO: 1 Explain structure of bacteria in detail ? also explain some cell organelle of bacteria cell and its function ?**

**Ans**. **Structure Of Bacteria:**

Smaller and simple in structure than eukaryotic cells , with no recognizable organelles.

All of the activities performed by organelles also take place in bacteria , but they are not carried out by specialized structures.

The small size simpe design and broad metabolic capabilities o bacteria allow them to grow and divide very rapidly and to inhabit and flourish in almost any environment.

They were first seen under a microscope by Anton van Leeuwenhoek in 1676.

As microscopes have improved , scientists have come to understand bacteria cell structure better.

**Cell Wall:**

The cell wall is the outermost component common to all bacteria (except

Mycoplasma species, which are bounded by a cell membrane, not a cell wall).

Some bacteria have surface features external to the cell wall, such as a capsule,

flagella, and pili, which are less common components and are discussed next.

The cell wall is located external to the cytoplasmic membrane and is composed

of peptidoglycan. The peptidoglycan provides structural support and

maintains the characteristic shape of the cell.

Cell Walls of Gram-Positive and Gram-Negative Bacteria

The structure, chemical composition, and thickness of the cell wall differ in gram-

positive and gram-negative bacteria.

**Cell Organelles :**

Organelle ( little organ ) A small structure in the cell that performs a specific function.

Membrane bound organelle are found only in eukaryotic cells

Bacteria are simple cells that do not contain a nucleus or other membrane -bound organelles. However, they do contain other cellular structures that aid with their life processes. These include the cellular envelope, the flagellum and pili, and ribosomes.

**Bacterial Cell Function:**

In the grand scheme of things, the function of each bacterial cell begins and ends with collecting enough nutrients to survive. Bacterial cells consist of a phospholipid bilayer, and in some cases a layer of peptidoglycan.

**Q.NO: 2 What is bacterial culture media ? Write down some types of bacterial culture media in** **detail ?**

**Ans**. **Bacterial culture media:**

A culture media is a special medium used in microbiological laboratories to grow different kinds of microorganisms. A growth or a culture medium is composed of different nutrients that are essential for microbial growth. The solid culture media is composed of a brown jelly like substance known as agar.

**Types Of Bacterial Culture Media:**

Advantages of solid media

**1.Solid Media**

\*Bacteria may be identified by studying the colony

character,

\* Mixed bacteria can be separated.

Solid media is used for the isolation of bacteria

as pure culture. 'Agar' is most commonly used to

prepare solid media. Agar is polysaccharide

extract obtained from seaweed. Agar is an ideal

solidifying agent as it is :

(a) Bacteriologically

inert, i.e. no influence on bacterial growth,

(b) It remains solid at 37°C, and (c) It is transparent.

**2. Liquid Media.**

It is used for profuse growth,

e.g. blood culture in liquid media. Mixed

organisms cannot be separated.

**Routine Laboratory Media:**

These are classified into **six** **types**: (1) Basal

media, (2) Enriched media, (3) Selective media,

(4) Indicator media, (5) Transport media, and (6)

Storage.

1. **NO:3 What is difference between sterilization and disinfection ? Write down some methods used for sterilization ?**

**Ans. Sterilization:**

Sterilization can be define as any process that effectively kill or eliminates transmissible agents ( such as fungi , bacteria , viruses and prions ) form a surface , equipment ,foods , medications ,or biological culture medium.

Sterilization and disinfection are both decontamination processes. While

Sterilization is the destruction or removal of all forms of life, with particular reference to microbial organisms. The limiting factor and requirement for sterilization is the destruction of heat-resistant bacterial and mycotic spores.

**Disinfection:**

Disinfection is the destruction of pathogenic and other kinds of microorganisms by physical or chemical means. Disinfection is less lethal than sterilization because it destroys most recognized pathogenic microorganisms, but not necessarily all microbial forms, such as bacterial spores. Disinfection does not ensure the margin of safety associated with sterilization processes.

**Methods used for sterilization:**

**Methods of Sterilization for Medical Device:**

Common methods of sterilization include physical methods and chemical methods. Physical methods include dry heat, steam, radiation, and plasmas. Radiation encompasses a variety of types, including gamma radiation, electron beam, X-ray, ultraviolet, microwave, and white (broad spectrum) light. Chemical methods include, for example, ethylene oxide, propylene oxide, chlorine dioxide, ozone gases, and a variety of chemicals in liquid and vapor form, such as glutaraldehyde, hydrogen peroxide, and peracetic acid.

**Q.NO:4 Write a note on structure of fungi in detail ?**

**Ans.** Fungi are eukarkoytic organisms that are either unicellular or multicellular. They are heterotroph s and live by decomposing and absorbing a wide variety of organic material on which they grow.

**Structure of Fungi:**

**Hyphae:** Hyphae are long thread like structures which form the fungal body. They consist of tubular cell wall made of chitin. They contain cytoplasm and nuclei. Hyphae are divided into cells with internal cross-walls called ‘septa’. These septa have perforated pores to allow the movement of cytoplasm, ribosomes, and mitochondria.

**Mycelium:** Cluster of hyphae interconnect and bundle up into a mycelium. Growth always occurs in the tip of the mycelium so it continues to grow until they cover the food source completely. They also absorb the nutrients and produce fruiting bodies.

**Fruiting body:** Fruiting body produces spores which are involved in fungal reproduction. They are produced on the surface of the food source which allows the spores to be easily carried by wind, water, etc. Fruiting body is the only part of fungus that is visible to naked eye. Excellent examples of fruiting body are mushrooms, which is the part of fungus that produces spores.

**Q.NO: 5 write are few hospital based infection that can be transfer to others due to un hygienic condition ? Explain with an example ?**

**Ans**.Infection is spread to the susceptible patient in the clinical setting by various means. Health care staff also spread infection, in addition to contaminated equipment, bed linens, or air droplets. The infection can originate from the outside environment, another infected patient, staff that may be infected, or in some cases, the source of the infection cannot be determined. In some cases the microorganism originates from the patient's own skin microbiota, becoming opportunistic after surgery or other procedures that compromise the protective skin barrier. Though the patient may have contracted the infection from their own skin, the infection is still considered nosocomial since it develops in the health care setting.Nosocomial infections can cause severe pneumonia and infections of the urinary tract, bloodstream and other parts of the body. Many types display antimicrobial resistance, which can complicate treatment.

**Example:**Hospital-acquired pneumonia

Ventilator-associated pneumonia

Urinary tract infection

Gastroenteritis

Puerperal fever

Central line-associated blood stream infection.