**Medical Microbiology. Dental 4th semester.**

**Mid-term assignment paper.**

**INSTRUCTOR . Muhammad Sohail**

*Instruction; Write briefly and up to the point. All questions carry equal marks.*

* Explain Structure of bacteria in detail ? also Explain some cell organelle of bacterial cell and its function
* What is Bacterial culture media ? write down some types of bacterial culture media in detail.?
* What is the difference between Sterilization and disinfection ? write down some methods used for sterilization ?
* Write a note on Structure of fungi in detail ?
* What are few Hospital based infections that can be transfer to others due to un hygienic condition ? Explain with an example ?

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NAME : Mehroz Nigah ROLL # : 14470 PROGRAM : BS (DT) SEMESTER :4th **--------------------------------------------------------------------------------------------------** **Ans# 1** STRUCTURE OF BACTERIAL CELL Bacterial cell appeared 4 billion years ago. They are the simplest and smallest cells. Bacteria is the prokaryotic, unicellular organism. Bacterial cell lacks membrane bounded organelles. Also lack nuclear membrane. Genetic material (DNA/RNA) floats in the cytoplasm. Bacterial cell contains; a) **Capsule:** Slim outer coating that reserve the nutrients. b) **Cell wall:** Tougher midde layer. c) **Cell membrane:** Delicate inner skin that act as permeability barrier and helps in the transportation of solutes. d) **Cytoplasm:** A liquid fluid substance present inside the cell. e) **DNA:** DNA is the chromatin materialfloating in the cytoplasm of bacterial cell, present in one big loop. f) **Pilli:** For sticking to surfaces and protection against phagotrophic engulfment. g) **Flagella:** For swimming movement. h) **Plasmid:** Extrachromosomal genetic material. **Size :** varies from 10-100 microns. **Shape:** Bacteria is present in different shapes. 1. Spherical shaped - Cocci 2. Rod shaped - Bacilli 3. Helical shaped - Spirilla **ORGANELLE OF BACTERIAL CELL** Bacterial cell lacks other organelles but ribosome is the only organelle present in the bacterial cell. **Ribosome:** Ribosomes are responsible for protien synthesis inside the cell and they are site of translation in bacterial cell. ----------------------------------------------------------------- **ANS# 2 BACTERIAL CULTURE MEDIA** Bacterial culture are used for cultivating microbial organisms by letting them reproduce in culture media under controlled labortory conditions. Culture medium or growth medium is liquid or gel to support the growth of microorganisms.  **TYPES OF MEDIA (Based on consistency)** 1) Liquid media - It is not fully liquid but is semi-liquid or gel type. Liquid media helps the microorganisms to stay suspended. 2) Solid media - It is composed of liquid media and agar. Agar is a solidifying agent. **TYPES OF MEDIA (Based on ingredients)** There are six types of bacterial culture media. **1) BASAL MEDIA:** This type of media is pre-made. Used for the growth of bacteria that do not need enrichment of the media. They can be both liquid or semi-solid form. Example: Nutrient-Agar media. **2) ENRICHED**  **MEDIA:** This type of media is enriched usually by adding blood,serum or egg to the basal media. Example: Blood-Agar media. **3) SELECTIVE MEDIA:** This type of media favours the specific bacteria. It is used to find that which type of bacteria is present. Some inhibitory substance is added to solid media to inhibit the growth of un-desired bacteria and particular bacteria grows in selective medium. Example: Lowenstein-Jensen media. **4) INDICATOR MEDIA:** An indicator(chemical) added to this media which changes its colour when bacteria grows in it. Example: MacConkey's Agar media. **5) TRANSPORT MEDIA:** This media is used for transportation of samples and specimens from one place to another. Also some nutrients are added for bacteria survival. Example: Stuart's medium, Glycerol saline. **6) STORAGE MEDIA:** This type of media is used for storing the bacteria for a long duration of time. Example: Egg saline medium. --------------------------------------------------------------- **Ans#3 DIFFERENCE B/W STERILIZATION & DISINFECTION** Sterilization and disinfection is differentiated from one another. **STERILIZATION:** It is the physical or chemical process that completely destroys or removes all the microbes including their spores. **DISINFECTION:** It is the process of killing or removing harmful microorganisms without harming their spores. **METHODS OF STERILIZATION** There are following 2 methods of sterilization. 1) Physical method 2) Chemical method  **PHYSICAL METHODS:** Physical sterilization includes; a) Drying b) Sunlight c) Filteration d) Radiations (gamma, uv) e) Heat Dry heat (oven) Moist heat (autoclave) **CHEMICAL METHODS:** Chemical methods includes; a) Liquid (Alcohols, phenols, aldehydes) b) Gaseous (Formaldehyde, ethylene oxide) --------------------------------------------------------------- **Ans# 4 STRUCTURE OF FUNGI** Fungi is a eukaryotic organism,that is more related to animal than plant kingdom. Fungi are non-motile and have no chlorophyll so, they are non-photosynthetic. Fungi are also decomposers. Fungi is an important source of antibiotics- Pencillin. Some fungi are edible like mushrooms. Fungi feed theirselves as saprophytes or parasites. Fungi mostly exist in 2 forms. 1. Hyphae - multicellular and filamentous **CELL WALL:** Cell wall of fungi is made up of chitin instead of cellulose. **PLASMA MEMBRANE:** Is a bi-layered membrane and also sterol is present in it. **ORGANELLES:**  The cytoplasm of fungal cell contains following organelles. 1. Mitochondria 2. Golgi bodies 3. Ribosomes 4. Endoplasmic Reticulum 5. Lysosomes 6. Microtubules and vesicles 7. A membrane bounded nucleus that contain chromatin material. ------------------------------------------------------------------------------------ **Ans# 5 NOSOCOMIAL INFECTIONS** Some infections that can be transfer to others due to unhygeinic conditions are known as nosocomial infections. **CAUSES:** These infections are caused by viral, bacterial and fungal pathogens. **SITES OF INFECTION:** The most common sites of infections are the lungs, urinary tract, bloodstream and surgical wounds. **TRANSMISSION:** Nosocomal infections usually transmits via healthcare workers, patients, surgical equipments, contaminated food and water and through personal unhygeine.  **EXAMPLES:** 1. Urinary Tract Infection (UTI) 2. Surgical Site Infection (SSI) 3. Pneumonia 4. COVID-19 is the best example of nosocomial infection now a days. --------------------------------------------------------------------------------