MEDICAL MICROBIOLOGY.DENTAL 4TH SEMESTER

Mid-term assignment paper.

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Q1) Explain structure of bacteria in detail? Also explain some cell organelle of bacterial cell and its function  
Ans: Bacteria are prokaryotes, lacking well-defined nuclei and membrane bound organelles and with chromosomes composed of a single closed DNA circle. They come in many shapes and size. From minute spheres, cylinders and spiral threads, to flagellated rods and filamentous chains. They are found practically everywhere on Earth and live in some of the most unusual and seemingly inhospitable places.  
1) It is single cell. Means it is one body cell.  
2) It have external attachments  
 a) Flagella  
 b) Pilli  
Flagella: Thread like structure. Its function is to do movement for bacteria.  
Its movement depend upon chemical structure. Some move towards chemical. Some move towards light  
Pilli: Its function is attach bacteria to a host and transfer DNA from bacteria to host and start reproduction.  
3) Nucleoids are present No membrane bounded nucleus is present.  
Its nucleoids don’t have a fix position.  
4) It have inclusion bodies to perform many function.  
Also suspended particles.  
E.g. Cytoplasm  
 Lysozyme.  
5) It have the ability to change its genetic code so antibiotic will not be able to find it.  
Types of bacteria   
 there are two types of bacteria.  
a) Gram positive:  
 It have large peptidoglycan chain.  
b) Gram negative:  
 it have small peptidoglycan  
TEST:   
If we give die to a bacteria and it retains the color then it is gram positive. And if the color is gone then it is gram negative.  
Q.2) what is bacterial culture media? Write down some types of bacterial culture media in detail?  
Ans:   
Microbiological culture media:-  
culture media is the food used to grow and control microbes.  
Culture media contains nutrients and physical growth parameter necessary for microbial growth. All micro-organisms cannot grow in a single culture medium and infect many can’t grow in any known culture medium organisms that cannot grow in artificial culture medium are known as obligate parasites.   
Bacterial culture media can be classified on the basis of  
1) consistency 2) composition 3) purpose  
1) Classification of consistency:-  
 a) Solid medium:- Solid medium contain agar at a concentration of 1.5—2.0% or some others mostly inert solidifying agent. Solid medium has physical structure and allows bacteria to grow in physically informative are useful way eg.as colonies or in streaks)  
 b) Semi-solid medium:- Semi-solid media are prepared with agar at concentrations of 0.5% or less they have soft custard like consistency and are useful for the cultivation of micro-acrophobic bacteria or for determination of bacterial motility  
 c) Liquid (Broth) medium:- These media contains specific amount of nutrients but don’t have trace of gelling agents such as gelatin or agar.  
2) Classification of composition: -  
 a) Synthetic or chemically defined medium: - A chemically defined medium is one prepared from purified ingredients and therefore its exact composition is known  
 b) Non-synthetic:- Non synthetic medium contains at least one component that is nor even completely consistent from batch.  
3) Classification of purpose: -  
 a) Basic media: - Basal media are basically simple media that support most non-fastidious bacteria  
 b) Enriched medium: - Addition of extra nutrients in the form of blood, serum, eggs, yolks, etc. to basal medium makes enriched media  
 c) Selective and enriched media: - Are designed to inhibit unwanted commensal or contaminating bacteria and help to recover pathogen from a mixture of bacteria  
Q.3). What is the difference between sterilization and disinfection? Write down some method used for sterilization?   
Ans:-

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| --- | --- |
| Sterilization | Disinfection |
| 1).The process of killing or removing bacteria and all other forms of living micro-organisms and there spares from preparation 2).Essential concept in the preparation of sterile pharmaceutical products  3).is to provide a product that is safe and eliminates the possibility of introducing. | 1).Decontamination-removal of microorganisms contaminating an object 2).Preservation-preventing methods of method of microbes-caused spoilage of susceptible products  (pharmaceuticals, foods) 3).Sanitization-removal of microbes that pose a threat to the public health, food industry, water conditioning :- Sanitizer-an agent, usually a detergent, that reduces the numbers of bacteria to a safe level |

: - Methods of sterilizations:-  
Three methods:-  
1). Physical method  
 a) Dry heat sterilization  
 b) Moist heat sterilization  
 c) Sterilization by radiation (gamma radiation)   
2). Chemical method  
 a) Gaseous sterilization  
 b) Sterilization by disinfectant  
3). Mechanical method  
 Pass through bacteria proof filter  
Q.4). Write a note on structure of fungi in detail?  
Ans:-The main body of most fungi is made up of fine, branching, and usually colorless threads called hyphae. Each fungus will have vast numbers of these hyphae, all intertwining to make up a tangled web called the mycelium.  
The mycelium is generally too fine to be seen by the naked eye, except where the hyphae are very closely packed together. The picture on the left was taken through a microscope. The hyphae are magnified 100 times life size. Some fungi, such as Honey Fungus, which is a parasite of woodland trees, have hyphae collected together into long cables, called rhizomorphs. Because there are so many hyphae packed together, they are easily seen, forming black 'bootlaces'. These can spread through a woodland infecting neighboring trees.

Fungal mycelium is mostly hidden from human view, not only because of its small size, but also as a result of its location. The tangled mycelia mass is usually hidden deep within its food sources, such as rotting matter in the soil, leaf litter, rotting wood, or dead animals. The mycelium remains undetected until it develops one or more fruiting bodies, containing the reproductive spores.  
Q.5).What are few hospital based infections that can be transfer to others due to un-hygienic condition? Explain with examples?  
Ans:-   
 Hospital based infections:-  
 a) Gram-negative bacteria  
 b) Hepatitis  
 c) HIV  
 d) Influenza  
a) Gram-negative bacteria:-  
 Gram-negative bacteria cause infections including pneumonia, bloodstream infections, wound or surgical site infections, and meningitis in healthcare settings. Gram-negative bacteria are resistant to multiple drugs and are increasingly resistant to most available antibiotics.  
b) HEPATITIS: -  
 The word hepatitis means inflammation of the liver and also refers to a group of viral infections that affect the liver. The most common types are hepatitis A, hepatitis B, and hepatitis C.

The delivery of healthcare has the potential to transmit hepatitis to both healthcare workers and patients. Outbreaks have occurred in outpatient settings, hemodialysis units, long-term care facilities, and hospitals, primarily as a result of unsafe injection practices; reuse of needles, finger stick devices, and syringes; and other lapses in infection control.  
c).HIV:-  
 Human immunodeficiency virus (HIV) is the virus that can lead to acquired immune deficiency syndrome (AIDS). HIV destroys blood cells called CD4+ T cells, which are crucial to helping the body fight disease. This results in a weakened immune system, making persons with HIV or AIDS at risk for many different types of infections. Transmission of HIV to patients while in Healthcare Settings is rare. Most exposures do not result in infection. [Human immunodeficiency virus is also called HIV  
d) INFLUENZA: -  
 Influenza is primarily a community-based infection that is transmitted in households and community settings. Each year, 5% to 20%of U.S. residents acquire an influenza virus infection, and many will seek medical care in ambulatory healthcare settings (e.g., pediatricians’ offices, urgent-care clinics). In addition, more than 200,000 persons, on average, are hospitalized each year.