

Final-Term Assignment (Spring-2020) (BS-MLT 2nd Sec-A & Sec-B)

Course Title: Basic Microbiology

Instructor: Mr. Fazli Zahir Mian

Time: 6 Hours

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Q1: Fill in the Blanks.

- 1) __Probiotic_____are live bacteria and yeasts that are good for and have beneficial effects on the host by improving its intestinal microbial balance.
- 2) Foods containing the combination of probiotics and prebiotics are referred to as __Flora_____.
- 3) When a chemical substance inhibits bacterial growth and proliferation is known as _____Rickttisia_speceis_____.
- 4) Microbes that are always present are called ____On the skin_____.
- 5) The symbiotic relation in which one organism benefits, the other is neither helped nor harmed is known as __commensalism_____.
- 6) _____Conjugation_____is the direct transfer of DNA from one bacterium to another.
- 7) A genetic structure in a cell that can replicate independently of the chromosomes is known as __origen and proceet_____.
- 8) The population of microorganisms that live on the skin and mucous membranes of health normal person from birth until death is called _____trachal toilt_____.
- 9) The expression of a gene into a protein occurs by __transcription_____and _____translation_____.

Q2: What is normal flora, advantages and disadvantages of normal flora?

- **Ans :** Normal flora are the microorganisms that live on another living organism (human or animal) or inanimate object without causing disease. The human body is not sterile; we become colonized by bacteria from the moment we are born. We are covered with, and contain within our intestines, approximately one hundred trillion bacteria that form the normal flora of our bodies. This normal flora helps to prevent us becoming colonized with more dangerous bacteria, which might lead to infection.



ADVANTAGES :

The normal flora is a bacteria found in or on ones' bodies on a temporary basis without causing disease. In that respect are larger numbers of bacteria than cells present in ones' body. The human body contains around 10¹³ cells, whereas the human physical structure is home to around 10¹⁴ bacteria. One-fourth of fecal weight consists of bacteria. They mainly inhabit the Large Intestine. They are likewise set up in the respiratory tract, particularly the nose, the Digestive tract, i.e., in the oral cavity and the terminal ileum and also in the Urinary tract

DISADVANTAGES :

It has both advantages as well as disadvantages. (i) They prevent or suppress the entry of the pathogens. ... (iv) Colonies produced by some organisms of normal flora have a harmful effect on the pathogens. (v) Endotoxins liberated by normal flora may help the defense mechanism of the body.

Q3: Write in detail different stages of Pathogenesis.

Ans : The pathogenesis of a disease is the biological mechanism (or mechanisms) that leads to a diseased state. The term can also describe the origin and development of the disease, and whether it is acute, chronic, or recurrent. The word comes from the Greek πάθος pathos ("suffering", "disease") and γένεσις genesis ("creation").

- Pathogenesis is the method by which a disease can develop.
- This can occur through foodborne intoxication where the causative agent produces toxins in the body (e.g., botulism).
- Another route is the colonization of an invading pathogen on the host surface,(e.g., *Vibrio* and *Cyanobacterium*).
- Pathogenesis can also occur by pathogens invading and breaching the body's barrier in order to multiply. (e.g., tuberculosis and plague).
- The relationship between a host and pathogen is dynamic.
- Production of disease occurs through a process of steps.
- The first five mechanisms make up a pathogen's invasiveness (i.e., ability to invade tissues).

Q4: How the Gene Transfer for one bacterium to another.

Ans : Bacteria can acquire DNA (i.e., new genes) in 3 basic ways:

- **Transformation**

uptake and retention of external DNA molecules

- **Conjugation**

direct transfer of DNA from one bacterium to another

- **Transduction :**



the transfer of DNA between bacteria by a virus

TANSFORMATION :

Under the right conditions, bacteria can “take in” external DNA fragments (or plasmids) by transformation.

- DNA binding proteins transfer external DNA across cell envelope
- homologous recombination can then occur

bacterial cells capable of transformation are referred to as competent.

CONJUGATION : Requires an F factor plasmid

- has all “conjugation genes”
- directs formation of a sex pilus

single DNA strand produced by DNA replication is transferred to F- cell through the sex pilus, recipient produces 2nd strand

TRANSDUCTION :

- A virus (phage) particle can transfer DNA fragments from one host cell to another followed by recombination
- requires a virus to be packaged with bacterial DNA “by mistake”

Q5: Write short notes on the following:

1.Symbiotic relationship :

symbiotic relationship in which both species benefit. Commensalism is a symbiotic relationship in which one species benefits while the other species is not affected. Parasitism is a symbiotic relationship in which one species (the parasite) benefits while the other species (the host) is harmed.

2.Antimicrobial drug :

A drug used to treat a microbial infection. "Antimicrobial" is a general term that refers to a group of drugs that includes antibiotics, antifungals, antiprotozoal, and antivirals.

3.Antimicrobial resistance :

Antimicrobial resistance is the ability of microbes to resist the effects of drugs in same dosage. When the drug loose the ability to either kill or inhibit the growth of microbes and the microbes gain the ability to survive in the presence



of drug to which they were previously susceptible this is called resistance.

4. Probiotics :

We usually think of bacteria as something that causes diseases. But the body is full of bacteria, both good and bad.

Probiotics are often called "good" or "helpful" bacteria because they help keep your gut healthy.

Probiotics are live bacteria and yeasts that are good for and have beneficial effects on the host by improving its intestinal microbial balance.

5. Prebiotic :

Non-digestible food ingredients that beneficially affect the host by selectively stimulating the growth and/or activity of one or a limited number of bacteria in the colon, and thus improve host health"

First identified in 1995

Typically oligosaccharides:

Found in:

Breastmilk, chicory root, leeks, onions, garlic, asparagus, whole grains, beans, banana etc.

It should increase the number and/or activity of bifid bacteria and lactic acid bacteria

Good luck.

