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**DEPARTMENT : MLT 2ND SEMESTER**

**SECTION:A**

**PAPER: Basic Microbiology**

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**Q1: Fill in the Blanks.**

**1: probiotic**

**2: Synbiotic**

**3: Bacteriostatic .**

**4: Resident flora.**

**5: commensalism.**

**6: conjugation**

**7: plasmid.**

**8: Normal microbial flora .**

**9: transcription and translation**

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

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 colonised 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.

Importance of The Normal Flora (Advantages) 5. The normal flora may antagonize other bacteria through the production of substances which inhibit or kill nonindigenous species. ... Importance of The Normal Flora (Disadvantages) 1. They can cause disease in the following: a) When individuals become immunocompromised.

### **Q3: Write in detail different stages of Pathogenesis.**

#### **1: transmission =**

In order to begin infection and eventually cause disease, pathogens must find a transmission route.

Transmission of an infectious agent can occur in many ways, but it is typically through exposed skin (e.g., a cut, abrasion, puncture, or wound) or mucous membranes (e.g., gastrointestinal tract, respiratory tract, or urogenital tract).

#### **2: Adherence**

= This attachment is called adherence and is a necessary step in pathogenicity.

Microbes contain ligands, which are projections that attach host receptors or surface proteins.

If a microorganism cannot adhere to a host cell membrane, disease will not Occur

#### **3: Invasion =**

At this point, microbes begin to invade the host and produce a bacteremia (i.e., presence of bacteria in the bloodstream) or viremia (presence of a virus in the bloodstream).

Some bacteria are able to cause disease while remaining on the epithelial barriers, while many need to penetrate that barrier.

Once this barrier has been penetrated, these pathogens can multiply without competition.

### **5: Evasion of Host Defenses.**

After colonization, pathogens circumvent the host's innate & adapted defenses by phagocytosis.

Multiple mechanisms are used by pathogens to evade a host's immune system.

Pathogens must also avoid adapted defenses.

They can also utilize antigenic variation to alter the antigen structure.

In addition, pathogens can mimic host molecules, which can cause disease-related damage.

### **6: Cause Damage or Disease to Host .**

Damage can occur through direct or indirect pathways.

Direct methods produce toxins, which are poisonous substances that produce toxemia within a host.

Three types of toxins are produced to cause damage:

- **Exotoxins:** Proteins secreted by pathogens that cause damage to the host (botulinum toxin, tetanus toxin).

### **7: Exiting the Host**

A pathogen must exit the body.

This occurs through various routes.

Examples include sneezing, coughing, diarrhea, coitus, pus, blood, or insect bites.

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

##### 1: Transformation:

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

##### 2: Bacterial 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

##### 3: 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:**

Symbiosis is any type of a close and long-term biological interaction between two different biological organisms, be it mutualistic, commensalistic, or parasitic. The organisms, each termed a symbiont, may be of the same or of different species.

### **2: Antimicrobial drug:**

Antimicrobial additive for coatings, surface treatments, and polymers. Doesn't promote antimicrobial resistance. Non-toxic/Non-irritating. NSF Certified. US EPA Registered. Food Contact Approved.

### **3: Antimicrobial resistance.**

Antimicrobial resistance happens when microorganisms (such as bacteria, fungi, viruses, and parasites) change when they are exposed to antimicrobial drugs (such as antibiotics, antifungals, antivirals, antimalarials, and anthelmintics). Microorganisms that develop antimicrobial resistance are sometimes referred to as “superbugs”.

### **4: Probiotics:**

Probiotics are live bacteria and yeasts that are good for you, especially your digestive system. We usually think of these as germs that cause diseases. But your 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 may contain a variety of microorganisms. The most common are bacteria that belong to

groups called *Lactobacillus* and *Bifidobacterium*.

## **5: Prebiotic:**

Prebiotics are compounds in food that induce the growth or activity of beneficial microorganisms such as bacteria and fungi. The most common example is in the gastrointestinal tract, where prebiotics can alter the composition of organisms in the gut microbiome.