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**Class: B.Sc Part –III (Hons.)**

**Paper: VII**

**Group: A**

**Topic: BACTERIA (Pathogenic Microbes)**

## **BACTERIA**

Bacteria are microscopic, single-celled organisms that exist in their millions, in every environment, both inside and outside other organisms.

Some bacteria are harmful, but most serve a useful purpose. They support many forms of life, both plant and animal, and they are used in industrial and medicinal processes.

Bacteria can use most organic and some inorganic compounds as food, and some can survive extreme conditions.

### **Types:**

There are many different types of bacteria. One way of classifying them is by shape. There are three basic shapes.

- Spherical: Bacteria shaped like a ball are called cocci, and a single bacterium is a coccus. Examples include the streptococcus group, responsible for “strep throat.”
- Rod-shaped: These are known as bacilli (singular bacillus). Some rod-shaped bacteria are curved. These are known as vibrio. Examples of rod-shaped bacteria include *Bacillus anthracis* (*B. anthracis*), or anthrax.
- Spiral: These are known as spirilla (singular spirillus). If their coil is very tight they are known as spirochetes. Leptospirosis, Lyme disease, and syphilis are caused by bacteria of this shape.

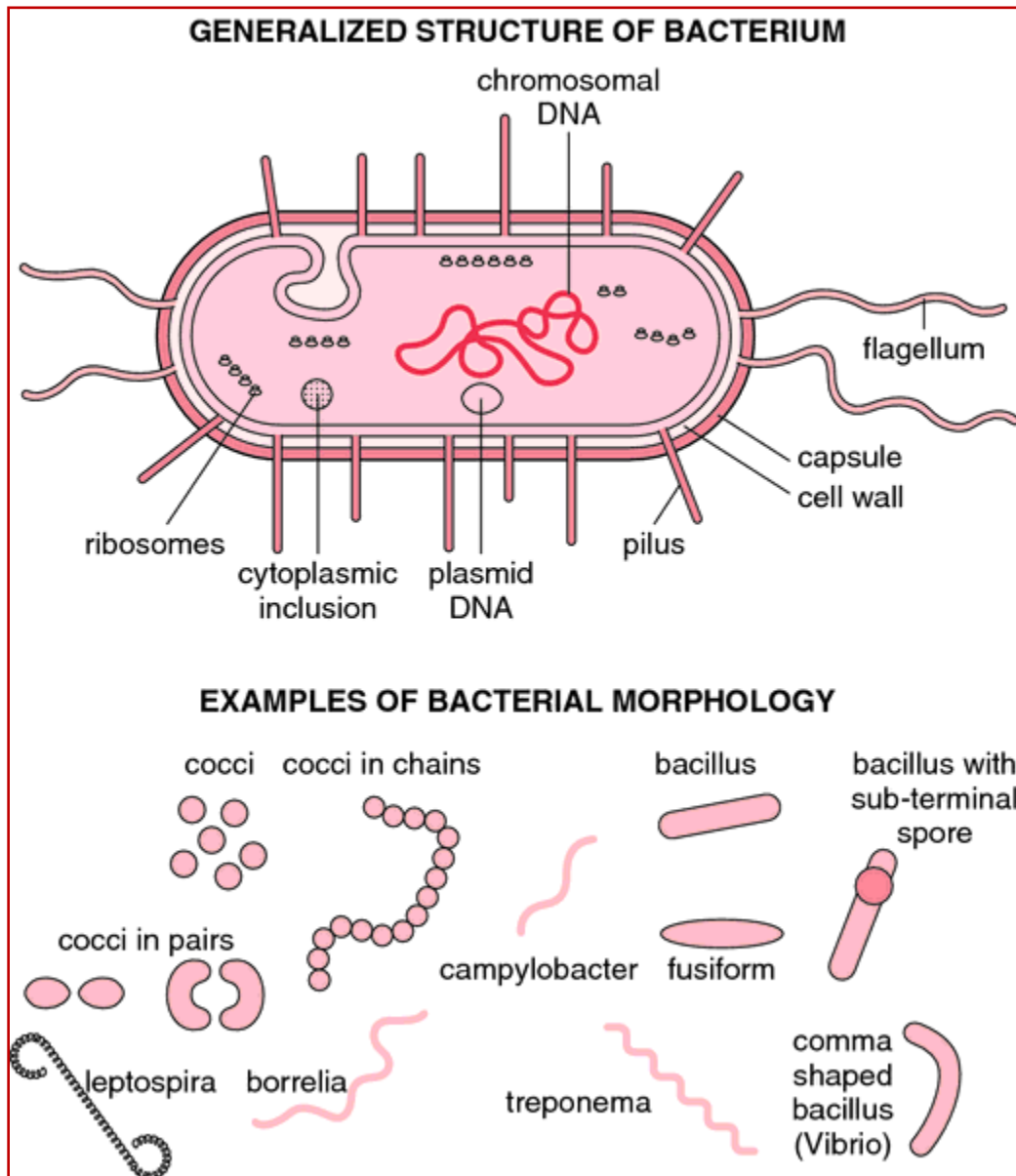
### **Structure:**

Bacterial cells are different from plant and animal cells. Bacteria are prokaryote, which means they have no nucleus.

A bacterial cell includes:

- Capsule: A layer found on the outside of the cell wall in some bacteria.
- Cell wall: A layer that is made of a polymer called peptidoglycan. The cell wall gives the bacteria its shape. It is located outside the plasma membrane. The cell wall is thicker in some bacteria, called Gram positive bacteria.

- Plasma membrane: Found within the cell wall, this generates energy and transports chemicals. The membrane is permeable, which means that substances can pass through it.



- Cytoplasm: A gelatinous substance inside the plasma membrane that contains genetic material and ribosomes.
- DNA: This contains all the genetic instructions used in the development and function of the bacterium. It is located inside the cytoplasm.
- Ribosomes: This is where proteins are made, or synthesized. Ribosomes are complex particles made up of RNA-rich granules.
- Flagellum: This is used for movement, to propel some types of bacteria. There are some bacteria that can have more than one.
- Pili: These hair-like appendages on the outside of the cell allow it to stick to surfaces and transfer genetic material to other cells. This can contribute to the spread of illness in humans.