Give Short answers to the following Questions

1. **What is DNA replication?**

   Answer: DNA replication is the process by which a cell makes an exact copy of its DNA prior to cell division.

2. **What is the difference between a prokaryotic and eukaryotic cell?**

   Answer: Prokaryotic cells lack a nucleus and other membrane-bound organelles, while eukaryotic cells have both a nucleus and other membrane-bound organelles.

3. **What is the function of chloroplasts in plant cells?**

   Answer: Chloroplasts are responsible for photosynthesis, the process by which plants convert sunlight into energy.

4. **What is the role of enzymes in biological reactions?**

   Answer: Enzymes act as catalysts in biological reactions, accelerating the rate at which they occur.

5. **What is the function of the circulatory system?**

   Answer: The circulatory system is responsible for transporting oxygen and nutrients to the body's tissues and removing waste products.

6. **What is the difference between a dominant and recessive gene?**

   Answer: Dominant genes are expressed when paired with either another dominant gene or a recessive gene, while recessive genes are only expressed when paired with another recessive gene.

7. **What is the role of the endocrine system?**

   Answer: The endocrine system is responsible for producing and regulating hormones, which play a critical role in maintaining bodily functions and homeostasis.

8. **What is natural selection?**

   Answer: Natural selection is the process by which organisms with advantageous traits are more likely to survive and reproduce, passing those traits on to their offspring and leading to changes in the species over time.

Briefly Explain the Questions Below:

Q1. What is the function of the mitochondria in a cell?

The mitochondria are organelles found in eukaryotic cells that are responsible for producing energy for the cell through the process of cellular respiration. Cellular respiration is the process by which cells convert glucose (a type of sugar) and oxygen into adenosine triphosphate (ATP), which is the primary energy source used by cells.

The mitochondria have an inner and outer membrane, with the inner membrane containing enzymes and electron transport chains that are used to generate ATP. During cellular respiration, glucose is broken down in the cytoplasm of the cell and the resulting pyruvate is transported into the mitochondria, where it is further broken down through a series of chemical reactions. This process produces ATP, carbon dioxide, and water as byproducts.

In summary, the function of the mitochondria in a cell is to generate ATP through cellular respiration, providing the energy needed for various cellular processes such as movement, growth, and repair.

Q2. What is the purpose of mitosis?

Mitosis is the process by which a single cell divides into two identical daughter cells. It is a fundamental process in the growth, development, and repair of multicellular organisms. The main purpose of mitosis is to ensure that each daughter cell receives a complete copy of the genetic material (DNA) contained within the parent cell. This is important for maintaining genetic continuity and stability from one generation of cells to the next.

During mitosis, a single cell undergoes a series of stages (prophase, metaphase, anaphase, and telophase) that result in the separation of the duplicated chromosomes into two identical sets, each of which is packaged into a separate nucleus in one of the daughter cells. This process ensures that each daughter cell has the same genetic material as the parent cell.

Mitosis is particularly important in the growth and development of multicellular organisms, as it allows for the rapid production of new cells to replace damaged or lost cells. It is also necessary for tissue repair and regeneration, such as in the healing of a wound or the regrowth of a damaged organ.

In summary, the purpose of mitosis is to ensure the accurate distribution of genetic material and to facilitate the growth, development, and repair of tissues in multicellular organisms.