**Darwin’s Theory of Evolution**

Charles Darwin, an English naturalist wrote a famous book named Origin of Species which was published in 1859 AD. In 1831, he began a 5 year voyage on the HMS Beagle that would change his life

*Darwinism is a theory of biological evolution developed by the English naturalist Charles Darwin (1809–1882) and others, stating that all species of organisms arise and develop through the natural selection of small, inherited variations that increase the individual's ability to compete, survive, and reproduce*.

Darwinism is also known as Theory of Natural Selection which can be explained in the following points:

1) Over-Production or Rapid rate of multiplication or enormous fertility: Every species tends to multiply in geometric ratio. It means that population doubling its number in one year increases four times next year.

If all the offspring remain alive and reproduce, soon there will be over-crowding.

2) Struggle for existence: Struggle helps to make the size of its own population constant. Organisms of different species compete with each other for food and shelter. Struggle may be interspecific or **intraspecific** and environmental dimensions

3) Variation and Adaptation

• Even though the offspring are very similar to their parents, they are not identical. They differ from each other to some or more extent in size, shape, behavior etc. that is called variation

• Some variations are better suited to life in their environment than others

• Fast predators capture prey more efficiently

• Any heritable characteristic that increases an organism’s ability to survive and reproduce in its environment is called an **adaptation**

– Examples of Adaptations:

• Tiger’s claws

• Camouflage colors

• Plant structures

• Avoidance behaviors

 4) Survival of the Fittest/Natural Selection:

• Only those individuals with favorable variations are able to survive and are adapted to the available conditions

• Ability to survive and reproduce in a specific environment is called **FITNESS**

• Fitness depends upon how well an organism is suited for its environment

o Fitness **is a result of ADAPTATION**

• Good adaptations allow organisms to survive and are passed on to their offspring.

• Good fitness: Reproduce

• Low Fitness: Few offspring/extinction

• He referred to “survival of the fittest” as Natural Selection

• Favorable characteristics are inherited over several generations.

5) Natural Selection

 Natural Selection is the process by which organisms with variations most suited to their local environment survive and leave more offspring

 Natural Selection occurs in any situation in which more individuals are born than can survive

. . 6) Origin of natural species: Over time, natural selection results in changes in the inherited characteristics of a population Due to the changed useful characters, the individuals survive and may acquire more useful characters to survive in the struggle.

About the evolution of giraffe, Darwinism suggested that the ancestral of giraffe were believed to have short neck or of different size. When there was shortage of grass, long necked giraffe were able to eat leaves or foliage but short necked were not able. Like this, because of competition and natural selection, only long- necked giraffe survived and short necked giraffe disappeared

DARWIN'S FOUR POSTULATES

i. individuals within species vary

ii. Some of these variations are passed on to offspring

iii. Individuals vary in their ability to survive and reproduce

iv. Individuals with the most favorable adaptations are more likely to survive and reproduce.

Common Descent

Natural selection produces organisms with different structures than their ancestor, different If we look back far enough we could find the common ancestors of all living things..

Criticism of Darwinism

a. Darwinism does not explain the origin of variation.

b. It is not always the case that useful variations are selected.

c. Natural selection is not the sole cause of specification but it is not only a guiding factor.

d. Darwinism does not always explain the presence of vestigial organs found in organism.