**8. <u>INHERITANCE BIOLOGY</u>**

**A) Mendelian principles :** Dominance, segregation, independent assortment.

**B) Concept of gene :** Allele, multiple alleles, pseudoallele, complementation tests

**C) Extensions of Mendelian principles :** Codominance, incomplete dominance, gene interactions, pleiotropy, genomic imprinting, penetrance and expressivity, phenocopy, linkage and crossing over, sex linkage, sex limited and sex influenced characters.

**D) Gene mapping methods :** Linkage maps, tetrad analysis, mapping with molecular markers, mapping by using somatic cell hybrids, development of mapping population in plants.

**E) Extra chromosomal inheritance :** Inheritance of Mitochondrial and chloroplast genes, maternal inheritance.

**F) Microbial genetics :** Methods of genetic transfers – transformation, conjugation, transduction and sex-duction, mapping genes by interrupted mating, fine structure analysis of genes.

**G) Human genetics :** Pedigree analysis, lod score for linkage testing, karyotypes, genetic disorders.

**H) Quantitative genetics:** Polygenic inheritance, heritability and its measurements, QTL mapping.



**I) Mutation :** Types, causes and detection, mutant types – lethal, conditional, biochemical, loss of function, gain of function, germinal verses somatic mutants, insertional mutagenesis.

**J) Structural and numerical alterations of chromosomes :** Deletion, duplication, inversion, translocation, ploidy and their genetic implications.

**K) Recombination :** Homologous and non-homologous recombination including transposition.

9. **<u>DIVERSITY OF LIFE FORMS:</u>**

A. **Principles & methods of taxonomy:**

Concepts of species and hierarchical taxa, biological nomenclature, classical & quantititative methods of taxonomy of plants, animals and microorganisms.

B. **Levels of structural organization:**
Unicellular, colonial and multicellular forms. Levels of organization of tissues, organs & systems. Comparative anatomy, adaptive radiation, adaptive modifications.