

CELL BIOLOGY AND GENETICS

Unit -I Cell Biology

Structure of model membrane, electrical properties and function of membrane. Lipid bilayer and membrane protein

Nucleus and nucleolar – ultra structure chemical nature, nucleolar chromosome.

Nuclear envelope: ultra structure and chemical nature, transport of material and pore complex.

Structural organization and function of intracellular organelles:

Cellwall, Golgibodies, Lysosomes, Peroxisomes.

Cell-divisions, Polytene chromosome, lampbrush chromosome and their importance.

Unit -II Genetics

Genetic interactions, Pleiotropy

Extra chromosomal inheritance:

Male sterility-origin, induction and application.

Paternal inheritance of chloroplast DNA and mitochondrial DNA.

Non chromosomal genes in *Chlamydomonas*.

Mitrochonrial genetics – petite in yeast and porky in *Neurospora*.

Unit -III Genetics

Chromosomal (genetic) mapping.

Molecular basis of spotnaneus and induced mutation, Physical and chemical mutagens

Genetics of matric characters:

Genes and quantitative characters.

Analysis of quantitative characters.

Mobile genetics:

Insertion sequences and transposons in Bacteria- AC-DS system.

Genetic control of cell division:

Regulation of mitotic cell cycle in Eukaryotes, cancerous cells, tumour inducing virus, Proto-oncogenes and cellular oncogenes.

Unit -1V Population Genetics

Principles of Mendelian genetics.

Hardy-Weinberg genetic equilibrium.

Factors affecting gene frequency - Natural selection.

Genetic polymorphism and Genetic drift.