**M.Phil. Botany**

**Paper – II Principles of Genetics**

**Unit – I**

Identification of the genetic material – Griffith effect. DNA duplex – α, β and Z helices. Activation of chromatin and regulation of haemoglobin genes.

**Unit – II**

 RNA viruses – TMV, CPMV and Brome Mosaic viruses.

**Unit – III**

 Britten and Davidson model of gene regulation. Regulation of hio Operon.

**Unit – IV**

 Transposable genetic elements in plants, bacterium and virus.

 Homology and Heterology between X and Y chromosomes of Man.

Genic determination of sex- *Asparagus*, Corn and Honeybee.

**Unit – V**

 Molecular mechanism of recombination.

 Sister chromatid exchange – detection by using BUDR**.**

**Unit – VI**

 Dimerization of thymine by UV and DNA repair.

Biochemical basis of mutation – tautomerization, transition, deamination and base analogue.

**M.Phil. Botany**

**Paper – III Biosocial Genetics**

**Unit – I**

Strategies in Gene regulation: Gene loss, gene amplification and gene rearrangement.

Immune response: T- helper, T- suppressor, T- cytotoxic cells.

**Unit – II**

Genetic diseases: Inborn error in phenyl alanine metabolism, induction of malignancy by physical and chemical agents, Muscular dystrophy, Philadelhia chromosome, Xeroderma pigmentosum and Leukema.

Gene Therapy – A promise for the future.

**Unit – III**

Somatic cell hybridization: Production of monoclonal antibodies and its effect in the medical field.

**Unit – IV**

Reproductive Engineering: Sperm bank, its prospects and problems.

**Unit – V**

 Amniocentesis: Its use in detecting defective fetuses and misuse in female foeticide.

 *In vitro* fertilization: Surrogate mother and social and economic problems.

**Unit – VI**

 Scope of Ti plasmid and its application in Plant genetic engineering.

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