

MCC, Department of Botany

M. PHIL. BOTANY

GENETICS

PAPER II & III

M.Phil. GENETICS

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.

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, Philadelphia chromosome, Xeroderma pigmentosum and Leukemia.

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.

REFERENCES

BENJAMIN LEWIN. 2003. Genes 7. Pearson Education Pvt. Ltd.

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BERNARD, R. GLICK AND JACK J. PASTERNAK. 1994. Molecular Biotechnology – Principles and Applications of Recombinant DNA. ASM Press, Washington.

BOURGAIZE, J. 2000. Biotechnology – Demystifying the concepts. Pearson Education Pvt. Ltd.

BREWER AND SING. 1983. Genetics. Addison Wesley Ltd.

FRIEFELDER. 2005. Molecular Biology. Jones and Barlett Publishers.

SHARMA AND SHARMA. 1965. Chromosome Practices. 3rd edition, Butterworths.

STRICKBERGER. 2005. Genetics. 3rd edition, Prentice Hall Ltd.

WATSON, J.D., T.A. LAKER, S.P. BELL, A. GANN, M. LEVINE AND LOSICK. 2004. Molecular Biology of the gene. Pearson Education Pvt. Ltd.