

PAPER IV- GENETICS

Subject code: UZOAM04

Unit I

Introduction to Genetics - Basis of Mendelian Inheritance and Mendelian Laws. Structure of Gene - Complementary Factors, Supplementary Factors, Inhibitory and Lethal Factors - Atavism.

Unit II

Blood Groups and their Inheritance in Human - Linkage and Crossing Over:- Drosophila - Morgans' Experiments - Complete and Incomplete Linkage, Linkage Groups, Crossing Over types, Mechanisms - Cytological Evidence for Crossing Over, Mapping of Chromosomes - Interference and Coincidence.

Unit III

Sex Linkage in Drosophila and Man, Sex Influenced and Sex Limited Genes - Genetic disorders in man (Sickle cell anemia, Phenylketoneuria, Alkaptonuria, Albinism, Down's syndrome, and Turner's Syndrome) Cytoplasmic Inheritance - Male Sterility (Rode's Experiment). CO₂ sensitivity In Drosophila, Milk Factor in Mice.

Unit IV

Nature and Function of Genetic Material - Fine Structure of the Gene - Cistron, Recon, Muton - Gene Regulation - Operon Concept - Lac Operon. Mutation - Molecular Basis of Mutation, Types of Mutation, Mutagens, Chromosomal Aberrations - Numerical and Structural Examples from Human.

Unit V

Applied Genetics - Animal Breeding, Inbreeding, Out Breeding, Hybrid Vigour. Population Genetics, Hardy Weinberg Law - Gene Frequency, Factors Affecting Gene Frequency, Eugenics and Euthenics.

Text Books:

1. Watson. J.D. and W.A. Benjamin, 1976. Molecular Biology of the Gene, 3rd, Benjamin Co. Inc., New York, 739 pp
2. Stickberger, 1968. Genetics, Macmillan Publications, New York, 914 pp.

Reference Books

1. Verma, P.S. and V. K. Agarwal, 1995. Genetics, 8th edition, S.Chand & co., New Delhi - 110 055, 580 pp.
2. Hartl, D.L. and D. Freifelder, 1988. Basic Genetics, John & Barlett Publishers, 505 pp
3. Gardner, 1972. Principles of Genetics, Wiley Eastern Pvt. Ltd. 590 pp.