

**2237**

**SECOND YEAR TDC SCIENCE,  
ZOOLOGY  
PAPER-II**

**GENETICS AND BIOTECHNOLOGY**

**Duration : 3 hours**

**M.M.: 50**

**UNIT-I**

- 1 Light and electron microscope structure of chromosome (from nucleosome to organization of chromatids. Morphological classification of chromosome).
- 2 Extra-chromosomal inheritance.
- 3 Chromosomal theory of sex determination, hormonal theory of sex determination, X and Y chromosomes, gynandromorphs.

**UNIT-II**

- 4 Brief history of genetics, mendelian laws and their significance.
- 5 Linkage and crossing over : kinds of linkage – complete and incomplete linkage, linkage groups, significance of linkage.
- 6 Genetic interaction : duplicate genes, epistasis, multiple-gene inheritance, ABO blood group, Rh factor..

**UNIT-III**

- 7 Genetic code: triplet, initiation and termination codons, palindromes.
- 8 Concept of gene, mucon, recon,cistron, gene expression, lac-operon, trip-operon.
- 9 Genetic engineering: Restriction enzymes, cloning vehicle, C-DNA, applications of genetic engineering. Hybridoma technology.

**UNIT-IV**

- 10 Mutations: Definition, gene mutation, chromosomal mutation, chromosomal aberrations, somatic and germ mutations, numerical alterations of chromosomes, molecular basis of mutation, mutagenic agents
- 11 Polytene and lamp-brush chromosomes.
- 12 Eugenics and genetic counselling.

**UNIT-V**

- 13 Medicines and biotechnology: Microbes in medicine, antibiotics, vaccines, enzymes and antigens.
- 14 Food and dairy microbiology: Fermented food production, dairy products, food preservation, microbial spoilage, alcoholic beverages, and vinegar.
- 15 Role of Biotechnology in health care.