

MB-10**OPTION (F). MOLECULAR BIOLOGY AND BIOTECHNOLOGY**

Max. Marks - 80

Units	Topics
I	Biotechnology - a Historical overview major, landmark and achievements, Genetic Material of prokaryotes & eukaryotes properties and function Replication. Transcription, Reverse transcription, Inhibition of replication and transcription Mechanism of gene expression in prokaryotes and eukaryotes, inhibition of gene expression, ploidy-status, Cryopreservation and its importance.
II	Genetic engineering/Recombinant DNA technology outline of genetic engineering procedure Enzyme, Isolation of Plasmid and chromosomal DNA molecule, PCR, cloning vector DNA hybridization techniques, Southern, Western & Northern Blotting insertion of particular DNA molecule into a vector, Transformation and growth of cell, Detection of recombination molecular, selection & Screening, Sequencing of DNA gene Identification and mapping, Expression of Cloned Gene.
III	Cell and Tissue Culture (Animal and Plants) History, Media Preparations, culture technique. Production of haploids anther & pollen, culture organogenesis and embryogenesis Somaclonal variations, Hybridomas and monoclonal antibodies (MAB), Hazard associated with MAB Development of Transgenic Plants and animal Hybridoma technology, Aseptic technique & sterilization.
IV	Application of Biotechnology in Agriculture, horticulture, forestry Food and Industries, Health care and immunology, Environment Biotechnology and ethics, New vistas emerging scenario.
V	Basis principles of instrumentation. Application of different techniques in biology Spectrophotometer, Electrophoresis Chromatography and microscopy. Importance of statistics in Biological studies Test of significance based on small and large samples t, z, x ² and F test, Analysis of variance, correlation and Regression. Computer Application - Computer in biology Basics of Computers simple graph plotting, Bioinformatics. Detailed study of internet.