Syllabus for M.Sc. Biotechnology Entrance Test

PART-A **Marks-50**

CELL BIOLOGY: Cell Theory, broad classification of cell types, PPLOs, bacteria, eukaryotic microbes, plant and animal cells, ultra structure of cell organelles, cell division and cell cycle.

PHYSIOLOGY:

Photosynthesis: Ultrastructure of chloroplast, electron transport, photophosphorylation, calvin cycle, diversity in photosynthetic pathways (C3, C4, CAM) and photorespiration.

Nitogen metabolism: Biologial nitrogen fixation, nitrate reduction, amino acids and proteins synthesis.

Phytohormones: Auxins, cytokinins and gibberellins

Respiration: Ultrastructure of mitochondria, respiratory pathways: glycolysis, Kreb's cycle, electron transport, pentose phosphate pathway and fermentation.

Nutrition in animals: vitamins, minerals, composition and functions of blood, antigen, antibody reactions, kidney structure and function, structure of neuron and endocrine glands of mammals.

GENETICS: Mendelism: Principles of segregation and independent assortment, non-mendelian inheritance, Chromosome structure and chemical composition, eukaryotic and special types of chromosomes and their organization, sex determination, sex linked inheritance. Linkage and crossing over: 2 point & 3 point test cross, interference, coincidence. Mutations: Spontaneous and induced and their applications. Basic microbial genetics: Transformation, transduction, conjugation, isolation of auxotrophs. Nature of genetic material: RNA, DNA. Extra chromosomal inheritance: Mitochondrial and chloroplast genetic systems, Gene concepts, gene expression in pro and eukaryotes and genetic code.Problems on Mendelian principles of Monohybrid, dihybrid and test crosses.

ECOLOGY: Basic concepts of ecology: Biosphere, Ecosystem, Ecotone, Ecotype, Biome, Biomass, Energy flow through ecosystem and ecological pyramids, process of plant succession, hydrosere and xerosere, renewable and non-renewable resources and basic knowledge of air, water and soil pollution.

PART-B **Marks-50**

BIOTECHNOLOGY: Recombinant DNA technology: Gene cloning, cloning vehicles, plasmids, bacteriophages, viral vectors Genomic libraries, C-DNA libraries, Restriction endonucleases and ligases, gene transfer methods. Plant tissue culture: Totipotency, micropropagation, somatic embryogenesis, androgenic haploids, protoplast isolation fusion, somatic hybrids and cybrids, applications of plant tissue culture.

BIOCHEMISTRY:Carbohydrates: Classification, chemical reaction and properties of ribose, glucose, fructose, sucrose, structure and properties of starch.; **Lipids:** Classification, structure, physical and chemical properties of triglycerides, fatty acids, phospholipids. **Amino acids:** Classification, properties and chemical reactions, proteins: structure, classification, isolation and purification.**Enzymes:** Classification, factors affecting enzyme action, temperature, activators and inhibitors, co-enzymes, enzyme inhibition, specificity and mechanism of enzyme actions. **Nucleic acids:** Structure, properties of purine and pyrimidine bases, nucleosides and nucleotides, structure and properties of RNA and DNA.

MICROBIOLOGY: Classification, characteristics and ultrastructure of microbes: bacteria, algae, fungi, actinomycetes, mycoplasma and viruses, biofertilizers and single cell proteins.

BIOSTATISTICS: Mean, mode, median, range, variance, standard deviation and standard error. Problems related to above topics.

MODEL QUESTION PAPER

Time : 90 Minutes ***Max. Marks : 100***

The question paper consists of 100 questions in multiple choice covering the entire syllabus.

1. FlavrSavr technology was successfully completed in
   a) Brinjal b) Rice c) Sorghum d) Tomato
2. Mendelian principles were published in the year
   a) 1967 b) 1908 c) 1867 d) 1900

ELIGIBILITY CRITERIA

M.Sc. (BIO-TECHNOLOGY): Graduates (Candidates must have passed Degree Examination conducted by Kakatiya University or an examination recognized as equivalent by Kakatiya University) with Botany/Zoology/Micro-Biology/Bio-Technology/ Bio-Chemistry/Genetics/B. Pharmacy with 45% aggregate in part-II (for SC/ST 40%) are eligible to appear for the Entrance Test.