

DEPARTMENT OF BIOTECHNOLOGY
GITAM INSTITUTE OF SCIENCE
GANDHI INSTITUTE OF TECHNOLOGY AND MANAGEMENT (GITAM)
(Declared as Deemed to be University u/s 3 of the UGC Act, 1956)
GRCET-2019
Syllabus

PART-A

Research Methodology: Meaning of Research, Objectives of Research, Motivation in Research, Types of Research, Research Approaches, Significance of Research, Research Methods versus Methodology.

Defining the Research Problem: What is a Research Problem? Selecting the Problem, Necessity of Defining the Problem.

Research Design: Meaning of Research Design, Need for Research Design, Features of a Good Design.

Sampling Design: Census and Sample Survey, Implications of a Sample Design, Steps in Sampling Design, Criteria of Selecting a Sampling Procedure.

PART-B

1. Structure of Prokaryotic and Eukaryotic cells. Ultra structure and functions of Cell organelles. Cell division and regulation of cell cycle. Cell-cell interaction. Cell signaling-Hormones and their receptors. Classification of bacteria and virus. Bacterial staining techniques. Bacterial growth curve. Microbiology of Soil and water. Clinically important bacteria and viruses. Bacterial recombination.
2. Classification, structure, properties, functions of Biomolecules-carbohydrates, lipids, amino acids, proteins, nucleic acids and vitamins. Metabolic pathways and disorders of carbohydrates, lipids, amino acids, proteins and nucleic acids. Enzymes-factors affecting enzyme activity, Enzyme inhibition, Coenzymes, metalloenzymes, allosteric enzymes, isoenzymes and ribozyme.
3. Nature of Genetic material, organization of Genetic material in prokaryotes and eukaryotes, DNA replication, transcription and translation in prokaryotes and eukaryotes. Inhibitors of Protein synthesis. DNA damage and repair. Regulation of gene expression in prokaryotes and eukaryotes.
4. Principles of Mendelian inheritance, Linkage and crossing over. Cytoplasmic inheritance. Pedigree analysis. Hardy-Weinburg law. DNA methylation and Chromatin remodeling in gene expression Environmental regulation of gene expression. RNAi and Gene silencing.
5. Plant Tissue culture. Phytohormones. Edible vaccines and plantibodies. Plant secondary metabolites. Maintenance of Primary and established animal cell lines. Stem cells – Embryonic and Adult stem cells. Application of stem cells. Concepts of immune response. Cells and organs of the immune system Antigens. Antibodies-generation of antibody diversity.

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Model Paper

PART-A

Section-I Consists of FIFTY objective type questions. 50 x 1 = 50 Marks

1. The statement of purpose in a research study should:
 - (a) Identify the design of the study
 - (b) Specify the type of people to be used in the study
 - (c) Identify the intent or objective of the study
 - (d) Describe the study

2. Which of the following would generally require the largest sample size?
 - (a) Cluster sampling
 - (b) Simple random sampling
 - (c) Systematic sampling
 - (d) Proportional stratified sampling

Section-II Consists of TEN two marks questions. 10 x 2 = 20 Marks

PART-B

Section-I Consists of FIFTY objective type questions. 50 x 1 = 50 Marks

1. Name the biomolecule that acts as genetic material []
 - (a) Protein
 - (b) Carbohydrate
 - (c) DNA
 - (d) Lipid

2. Which cell organelle is absent in prokaryotes []
 - (a) Mitochondria
 - (b) Ribosome
 - (c) Chloroplast
 - (d) Nucleus

Section-II Consists of TEN two marks questions. 10 x 2 = 20 Marks
