

DEPARTMENT OF MICROBIOLOGY AND FST (FOOD SCIENCE AND TECHNOLOGY)
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)

Microbiology

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

Unit I

Morphology and ultrastructure of microorganisms. Sterilization techniques, Types of media, cultivation of microbes, preservation of microbial cultures, Microscopy, staining techniques, bacterial growth kinetics. Fermented foods, SCP, food microbiology. Biofertilizers, Biopesticides. Microbial ecology, Extremophiles. Design and types of fermentors, upstream and downstream processing.

Unit II

Classification, chemistry, properties and functions of metabolism Carbohydrates, Lipids, proteins, nucleic acids –of carbohydrates, amino acids, Enzymes : classification, nomenclature, assay & kinetics. Ribozymes and abzymes. Enzyme inhibition. Enzyme purification. Centrifugation, chromatographic techniques and electrophoresis.

Unit III

Types of immunity. Antigens & antibody, Ag-Ab reactions. The complement system. Major Histocompatibility Complex (MHC), Human leucocyte antigen (HLA) restriction. Hypersensitive reactions, Autoimmunity. Immunodeficiency diseases, MABs.; Immunization. Major infectious diseases. Antimicrobial agents, new emerging pathogens.

Unit IV

Microbial genetics- genome organisation, DNA structure function, mutations and repairs, recombination in bacteria. Recombinant DNA technology, Blotting techniques. PCR. Cloning vectors. Genomic / gene libraries. DNA sequencing methods. Restriction mapping. Microarrays. Transgenic organisms. Gene therapy. Bioethics.

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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:

1. Sampling is.....
2. A hypothesis is..... 10 x 2 = 20 Marks

PART-B

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

1. The cell wall of bacteria is made up of
 - (a) Cellulose
 - (b) Fructose
 - (c) Peptidoglycan
 - (d) UDP Glucose

3. Mobile phase in paper chromatography contains
 - (a) Butanol, ethanol, acetic acid
 - (b) Butanol, acetic acid, water
 - (c) Propanol, acetic acid, water
 - (d) Benzene

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

- 1) Western blotting is used to separate -----
- 2) EMB agar is a selective medium for -----