

from the 5 units of each paper. There will be 10 questions in **Section A** which will be asked from all the 5 units, i.e., 2 questions from each unit. These questions have to be answered in one word or a few words only. Each question will be of one mark. All the questions in **Section A** are compulsory. In **Section B**, 10 questions will be set from the 5 units, i.e., 2 questions from each unit. Students are required to attempt at least 1 question from each unit. Each question will carry 10 marks. The answers of each question should be given in about 250 words. In **Section C** there will be 4 descriptive type questions set from all the 5 units, not more than 1 question from each unit. These questions may also have subdivisions. The students are required to answer 2 questions, each in approximately 500 words. Each question will carry 20 marks .

PAPER-III
IMMUNOLOGY, ENZYMOLOGY AND
MICROBIAL TECHNOLOGY

Duration: 3 hrs.

M.M.:100

UNIT – I

Innate and acquired immunity, clonal nature of the immune response, nature of antigens - antibody structure and function, abzymes, antigen-antibody reactions, major histocompatibility complex, complement system.

Cells of the immune system: B-lymphocytes, T-lymphocytes, macrophages, natural killer and lymphokine activated killer cells.

UNIT – II

Regulation of the immune response, activation of B and T-lymphocytes, Lymphokines, T-cell regulation, MHC restriction, immunological tolerance.

Classification, nomenclature and general properties of enzyme: their isolation, purification and large-scale production.

UNIT – III

Mechanism of enzyme action and regulation; active and regulatory sites; chemical modification, general mechanistic principles, feedback inhibition, isozymes, enzyme activation, zymogens, multienzyme complexes.

Steady state kinetics: Methods for estimation of rate of enzyme catalyzed reaction with special reference to Michaelis–Menten equation. Effects of substrate, temperature, pH and inhibitors of enzyme activity.

UNIT – IV

Isolation, preservation and maintenance of industrial microorganisms, microbial growth and death kinetics, media for industrial fermentation, air and media sterilization.

Types of fermentation processes – analysis of batch, fed–batch and continuous bioreactors, stability and microbial reactors, analysis of mixed microbial populations, specialized bioreactors (pulse, fluidized, photobioreactors etc.) Environmental control of bioreactors.

UNIT – V

Downstream processing, whole cell immobilization and industrial applications.

Industrial production of chemicals – alcohol (ethanol), acids (citric acid and gluconic) solvents (glycerol, acetone, butanol), antibiotics (Penicillin, Streptomycin, Tetracycline), amino acids (Lysine, Glutamic acid), single cell protein.

Introduction to food technology – elementary idea of canning and packing, sterilization and pasteurization of food products.

Note:

The paper setter is required to set questions of 3 types contained in 3 Sections (**Section A**- 10 questions, **Section B**- 10 questions and **Section C**- 4 questions) from the 5 units of each paper. There will be 10 questions in **Section A** which will be asked from all the 5 units, i.e., 2 questions from each unit. These questions have to be answered in one word or a few words only. Each question will be of one mark. All the questions in **Section A** are compulsory. In **Section B**, 10 questions will be set from the 5 units, i.e., 2 questions from each unit. Students are required to attempt at least 1 question from each unit. Each question will carry 10 marks. The answers of each question should be given in about 250 words. In **Section C** there will be 4 descriptive type questions set from all the 5 units, not more than 1 question from each unit. These questions may also have subdivisions. The students are required to answer 2 questions, each in approximately 500 words. Each question will carry 20 marks .



