

8. **Pesticides:** Introduction, methods and control of pests with special reference to pyrethrum, tobacco, and other natural pesticides.
9. **Growth Regulators:** General account with special reference to plant hormones; Auxins, Gibberellins Abscisic acid and Cytokinins.
10. **Poisonous Plants including Allergens and Allergenic Preparations:** General introduction, case history, skin test, treatment of allergy, inhalant, ingestant, injectant, contactant, infectant and infestant allergens. Mechanism of allergy.
11. **Enzymes:** Enzymes obtained from plant source (Phytoenzymes). Papain Bromelain and Malt Extract. Enzymes obtained from Animal source. Rennin, pepsin, Pancreatin and Pancrealipase.

PHARMACOGNOSY-I (Basic) (Practical)

Paper 9

Marks 100

NOTE: Practicals of the subject shall be designed from time to time on the basis of the above mentioned theoretical topics and availability of the facilities, e.g. Introduction of the entire and broken parts of the plant drugs (Macro and organoleptic characters). Microscopic examination of powders and sections of plant drugs. Physicochemical and Microscopic testing of surgical dressings (Note: A minimum of 20 practicals will be conducted).

NOTE: A Study Tour will be an integral part of the syllabus and will be arranged at the end of the session for collection of medicinal plants from the country.

PHARMACEUTICS-III (PHARM. MICROBIOLOGY & IMMUNOLOGY) (Theory)

Paper 4

Marks 100

NOTE: The topics will be taught with special reference to their Pharmaceutical Applications.

1. **GENERAL MICROBIOLOGY:** Historical introduction, Scope of microbiology with special reference to Pharmaceutical Sciences. Nomenclature and classification of Micro-organisms.
2. **MICRO-ORGANISMS:**
 - a. **The Bacteria:** General and cellular Morphology, structure and function. Classification of Bacteria. Growth curve, growth factors and growth characteristics. Nutrition requirements and nutrition factors affecting growth. Culture Media, Bacterial cultures and staining Methods.
 - b. **The Viruses:** Introduction, Classification (and detail of at least one species from every group), cultivation and replication.
 - c. **The Fungi/Yeast/Molds:**
 - d. **The Protozoa:**

3. **THE NORMAL FLORA:** Microbiology of air, water and soil (general introduction and normal inhabitants of air, water and soil).
4. **INDUSTRIAL MICROBIOLOGY:** Introduction to Sterilization/ Disinfection. Fermentation. Pharmaceutical products Produced by fermentation process (Penicillins, Cepalosporins, Gentamycin, Erythromycin, Tetracyclines, Rifamycin, Griseofulvin).
5. **IMMUNOLOGY:** Introduction and types of Immunity: Specific and non-specific (Cellular basis of Immune response. Immunity, autoimmunity, tolerance. Antigen. Antibodies). Antigen-Antibody reactions and their clinical and diagnostic applications. Hypersensitivity and allergy. Drug allergy mechanism. Vaccination: Introduction and aims. Types of Vaccines. Current vaccine practices.
6. **FACTORY AND HOSPITAL HYGIENE AND GOOD MANUFACTURING PRACTICES:** Introduction, Control of microbial contamination during manufacture, Manufacturing of Sterile products, A Guide to Current Good Pharmaceutical Manufacturing Practices.
7. **INTRODUCTION TO DISEASES:** Dengue fever, Bird flu, SARS or other prevailing diseases of bacteria and virus.

<u>PHARMACEUTICS-III (PHARM. MICROBIOLOGY & IMMUNOLOGY) (Practical)</u>	
<u>Paper 10</u>	<u>Marks 100</u>

NOTE: Practical of the subject shall be designed from time to time on the basis of the above mentioned theoretical topics and availability of the facilities, e.g. Sterilization of Glassware and pharmaceutical products by various methods. Microbiological assays of Anti-biotics and vitamins. Preparation of general and selective Media and culturing of micro-organisms. Total and viable counts of micro-organism. Morphological and selective biochemical characterization of some specimen. Staining of Bacteria: Gram method, Acid fast, Giemasas staining, Capsule staining, Flagella staining and Spore staining. Microbiological analysis of air, water and soil (Note: A minimum of 20 practicals will be conducted).

<u>PAKISTAN STUDIES AND ISLAMIYAT (Compulsory) (Theory)</u>	
<u>Paper 5</u>	<u>Marks 100</u>

PART: A PAKISTAN STUDIES:

40 MARKS

1. INTRODUCTION/OBJECTIVES:

- Develop vision of historical perspective, government, politics, contemporary Pakistan, ideological background of Pakistan.
- Study the process of governance, national development, issues arising in the modern age and posing challenges to Pakistan.