Centre of Research for Development
&
P.G. Programme in Microbiology
University of Kashmir, Srinagar -190006

Course: Ph.D. Bio-Chemistry, Microbiology,Zoology, Botany
Paper I: Research Methodology Maximum marks: 100
Time: 3 hours

Unit I: Instrumentation-I

i. Specific procedure and precautions for sterilization of glass, instruments, and culture media.
ii. Aseptic procedure and maintenance of safety measures in a laboratory.
iii. Principle and working of autoclave, and laminar flow.
iv. pH Meter: Construction and Working principle.

Unit II: Instrumentation-II

i. Principle and application of:
    a. Confocal Microscope.
    b. Phase contrast microscope.
ii. Principle and application of:
    a. Scanning electron microscopy (SEM)
    b. Transmission electron microscopy (TEM)
iii. Electrophoresis: basic principle, agarose gel electrophoresis, Discontinuous PAGE, 2D gel electrophoresis.
iv. Chromatography: Size exclusion chromatography, Ion exchange chromatography, HPLC, LCMS, GC-MS

Unit III: Research Ethics

i. Research, meaning of research, and Objectives of the research.
ii. Types of Research, criteria of good research
iii. Research process, formulating the research problem, selecting the problem
iv. Ethics in research: Introduction to Bioethics and Plagiarism.

Unit IV: Statistics and preparation of manuscript

i. Types of methods of collecting data, and analysis of data.
ii. Correlation analysis, Types and applications.
iii. Types of errors in testing hypothesis, level of significance, p-value
iv. Tests of significance (t-test and chi-square test).

Signature of supervisor Signature of scholar