

MCC, Department of Botany

M. PHIL. BOTANY

RESEARCH METHODOLOGY

PAPER I

Paper-I Research Methodology

Unit-I

Light microscope-different types of microscopes: Dark-field, phase contrast, polarized light, interference contrast (Nomarski) and fluorescence . Electron microscope - Scanning and transmission electron microscopy (principle and uses). Photomicrography and photomacrography. Digital Photography.

Unit-II

Fixatives and microtomy Acetolysis method of pollen preparation. Bright-field stains and fluorochromes. Orthochromatic and metachromatic stains. Histochemical dyes for the localization of starch, proteins, nucleic acid and lipids. Principles of enzyme histochemistry and immunocytochemistry.

Unit-III

Principle and uses of paper, thin layer (TLC), column and gas Chromatography. Centrifugation-ordinary, high-speed, micro and ultra centrifuges. , Electrophoresis- gel, immuno and SDS-PAGE. Spectrophotometry- visible, UV, atomic absorption spectrometers. Colorimetry and pH metry.

Unit-IV

Sterilization Procedures: Fumigation, wet and dry sterilization, ultraviolet sterilization, ultrafiltration and surface sterilization. Maintenance of axenic culture.

Unit-V

Frequency distribution, measure of central tendency, standard deviation and correlation and regression. Experimental design and analysis, test of significance and analysis of variance (ANOVA). Chi-square test.

Unit-VI

Karyotyping of Human chromosomes from peripheral blood leucocytes using Geimsa Banding technique.

Floral morphogenesis of *Arabidopsis thaliana*.

Unit-VII

Introduction to Computers. MS-Office. Computers and statistical analysis; graph generation, audiovisual presentation. Retrieval of abstracts and bibliographic data. Internet and the World Wide Web.

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