

Paper 3b BIOTECHNOLOGY OF SECONDARY METABOLITES

B.Sc. va (Candidates admitted from the academic year 2008-2009)

Special Theory

UNIT I

Chemical Components of Plants: Introduction, Lipids - Hydrocarbons, Functionalised hydrocarbons, Terpenoids. Aromatics - Non phenolic aromatics, Phenols, Flavonols, Tannins and Quinons.

UNIT II

Biosynthesis of Secondary Metabolites in Plants: Primary metabolic pathway. Carotenoid biosynthesis, Anthocyanin biosynthesis. Phenolic, Alkaloid, and Terpenoid biosynthesis.

UNIT III

Biotechnology Production of Secondary Metabolites: Production of secondary metabolites in plant. Stages of secondary metabolites production – Stress and genetic engineering products.

UNIT IV

***In vitro* Production of Secondary Metabolites**

Tissue culture techniques for production Plant secondary metabolites. Methods for the production of secondary metabolites. Hairy root culture. Elicitation of product accumulation.

UNIT V

DNA Technology and Secondary metabolite production

Biotransformation and production of pharmaceutical compounds.

UNIT VI

Metabolomics: Introduction. Analysis of pathways. Metabolic network properties. Metabolic control analysis. Simulation of cellular activities. Biological markup languages.

Suggested Reading

RASTOGI, S.C., N. MENDIRATTA AND P. RASTOGI. 2005. *Bioinformatics- Methods and Applications- Genomics, Proteomics & Drug Discovery*, Prentice Hall of India Private Ltd.

RICHARD J. P. CANNELL.(edt) 1998. *Methods in Biotechnology NATURAL PRODUCT ISOLATION*. Humnan Press, Totowa, New Jersey.

PETER B. KAUFMAN, LELAND J. CSEKE, SARA WARBER, JAMES A. DUKE AND HARRY L. BRIELMANN. 1998. *Natural Products From Plants* CRC Press, New York.

PUROHIT, S. S., H. N. KAKRANI, AND A. K. SALUJA. 2003. *Pharmaceutical Biotechnology*. Agrobios (India)

RAMAWAT, K. G. and J. M. MERILLON. 1999. *Biotechnology: Secondary Metabolites*. Oxford & IBH, New Delhi.