

Elective Paper III (Group B)
Chemistry of Natural Products

60 Hrs.

I Terpenoids and Carotenoids

15 hrs

Classification, nomenclature, occurrence, isolation, general methods of structure determination, isoprene rule. Structure determination, stereochemistry, biosynthesis and synthesis of the following representative molecules: Citral, Geraniol, α -Terpineol, Menthol, Farnesol, Zingiberene, Santonin, Phytol, Abietic acid and B-Carotene.

II Alkaloids

15 hrs

Definition, nomenclature and physiological action, occurrence, isolation, general methods of structure elucidation, degradation, classification based on nitrogen heterocyclic ring, role of alkaloids in plants. Structure, stereochemistry, synthesis and biosynthesis of the following: Ephedrine, (+)-Coniine, Nicotine, Atropine, Quinine and Morphine.

III Steroids

15 hrs

Occurrence, nomenclature, basic skeleton, Diels' hydrocarbon and stereochemistry. Isolation, structure determination and synthesis of Cholesterol, Bile acids, Androsterone, Testosterone, Estrone, Progesterone, Aldosterone. Biosynthesis of steroids

IV Plant Pigments

7 hrs

Occurrence, nomenclature and general methods of structure determination. Isolation and synthesis of Apigenin, Luteolin, Quercetin, Myricetin, Quercetin-3-glucoside, Vitexin, Diadzein, Butein, Aureusin, Cyanidin-7-arabinoside, Cyanidin, Hirsutidin. Biosynthesis of flavonoids: Acetate pathway and Shikimic acid pathway.

V Porphyrins

3 hrs

Structure and synthesis of Hemoglobin and Chlorophyll.

VI Prostaglandins

3 hrs

Occurrence, nomenclature, classification, biogenesis and physiological effects. Synthesis of PGE_2 and $\text{PGF}_{2\alpha}$.

VII Pyrethroids and Rotenones

2 hrs

Synthesis and reactions of Pyrethroids and Rotenones. (For structure elucidation, emphasis is to be placed on the use of spectral parameters wherever possible).

Books Suggested:

1. Natural Products: Chemistry and Biological Significance. J.Mann, R.S. Davidson, J.B. Hobbs, D.V. Banthorpe and J.B. Harborne, Longman, Essex.
2. Organic Chemistry, Vol 2, I.L. Finar, ELBS.
3. Stereoselective Synthesis : A Practical Approach, M. Nogradi, VCH.
4. Rodd's Chemistry of Carbon Compounds, Ed. S. Coffey, Elsevier.
5. Chemistry, Biological and Pharmacological Properties of Medicinal Plants from the

Americas, Ed.Kurt Hostettmann, M.P Gupta and A.Marston, Harwood Academic Publishers.

6. Introduction to Flavonoids, B.A Bohm, Harwood Academic Publishers.
7. New Trends in Natural Product Chemistry, Atta-ur-Rahman and M.I Choudhary, Harwood Academic Publishers.
8. Insecticides of Natural Origin, Sukh Dev, Harwood Academic Publishers.