

VI-T-1 PHARMACEUTICAL INDUSTRIAL MANAGEMENT

Status of pharmaceutical industries in India.

Project formulation, evaluation and implementation.

Pharmaceutical Factory Planning and layouts, preparation of flow diagrams, technical data sheets.

Management :

Concepts on Management, Principles of Management, Administrative and Operative Management Entrepreneurship Development.

Material management: Basic principles of Material Management, Purchase, Store and Inventory control.

Production Management : Different aspects of Production Management , Performance Evaluation Technique, flow-process, know how process and maintenance.

Accountancy: Principles of accountancy, Journal entries and ledger posting, preparation of trial balance, cash book, bank reconciliation statement, rectification of errors, profits and loss account, balance sheet, purchase, keeping and pricing of stocks, treatment of cheques, bill of exchange, promissory notes and hundies, documentary bills.

Economics: Principles of economics with special reference to the laws of demands and supply, demand schedule, demand curves, general principles of insurance and inland and foreign trade, procedure of exporting and importing goods.

Pharmaceutical Marketing: Functions, wholesale, retail, and mail order business ,market research.

Salesmanship: Principles of sales promotion, advertising, and ethics of Sales, merchandising, Window display and literature detailing.

Books Recommended

- 1. Shukla, S. M., Advanced Accountancy, Mahershwari Sahitya Bhawan, Agra.**
- 2. Gupta, R. L., Advanced Accountancy, Vol. I and II, Sultanchand & Company, New Delhi.**
- 3. Kotler, P., Marketing Management, Prentice Hall of India Limited.**
- 4. Stanton, W. J., Fundamentals of Marketing Tata McGraw Hill Limited, New Delhi.**
- 5. Buskir K. and Richard H., Principles of Marketing – The Management View, Hold Rinehard and Winston Incorporated, New York.**
- 6. Sherlekar, S. R., Marketing Management, Himalaya Publishing House, New Delhi.**
- 7. Mote, V. L., Paul, S. and Gupta, G. S., Managerial Economics Concepts and Cases, Tata McGraw Hill Limited, New Delhi.**

VI-T-2 PHARMACEUTICAL ANALYSIS-II

The theoretical aspects, basic instrumentation, elements of interpretation of spectra and pharmaceutical application of the following analytical techniques –

1. Polarography
2. Amperometry
3. Chromatography: Paper Chromatography TLC, GLC, HPLC, HPTLC.
4. Ultraviolet and Visible spectrophotometry
5. Infra red spectrophotometry.
6. Fluorimetry.
7. Mass Spectroscopy.
8. NMR Spectroscopy.
9. Atomic Absorption.
10. X- Ray Diffraction.
11. Flame Photometry.

VI-P-2 PHARMACEUTICAL ANALYSIS-II PRACTICALS

1. Instrumental analysis involving Polarographic and Amperometric techniques.
2. Chromatographic analysis of some pharmaceutical products.
3. Quantitative estimation of formulations containing single drug or more than one drug, using instrumental techniques.
4. Estimation of Na^+ , K^+ , Ca^{++} ions using flame photometry.
5. IR of sample with different functional groups ($-\text{COOH}$, $-\text{COOR}$, CONHR , $-\text{NH}_2$, $-\text{NHR}$, $-\text{OH}$, etc.).

6. Interpretation of the structure of simple organic compounds using UV, IR, NMR, and Mass Spectroscopy.

Books Recommended

1. **Svehla, G. Vogel's Text Book of Micro and Semi Micro Qualitative Inorganic Analysis, Orient Longman, Hyderabad.**
2. **Beckett, A.H. and Stenlake, J.B., Practical Pharmaceutical Chemistry, The Athlone Press of the University of London.**
3. **Chatten, L.G., Text Book of Pharmaceutical Chemistry, Marcel Dekker, New York.**
4. **Connors, K.A., A Text Book of Pharmaceutical Analysis, Wiley Interscience, New York.**
5. **Higuchi, J. and Hansen E.B., Pharmaceutical Analysis, Interscience Publisher John Willey and Sons, New York, Sydney.**
6. **Silverstein, R.M., Bassier, G.C., and Morrill, T.C., Spectrophotometric Identification of Organic Compounds, John Wiley and Sons Inc.**
7. **Willard, Merritt and Settle, Instrumental Methods of Chemical Analysis, CBS Publisher and Distributors, New Delhi.**
8. **Ewing, G.W., Instrumental Methods of Chemical Analysis,.**

VI-T-3 PHARMACEUTICAL CHEMISTRY-VII (MEDICINAL CHEMISTRY-II)

The synthesis of the selected drugs, mode of action, classification, uses, SAR of the following category of drug :

A) Drug Acting on CNS:

1. General Anaesthetics.
2. Hypnotics and Sedatives.
3. Opioid Analgesics.
4. Anti-convulsant.
5. CNS Stimulants.
6. Anti-parkinsonian Drugs.
7. Psychopharmacological Agents(Neuroleptics , Antidepressants, Anxiolytics)

(B) Anti spasmodic and Antiulcer Drugs.

(C) Anticoagulant and Anti Platelet Drugs .

(D) Diagnostic Agents .

(E) Pharmaceutical Aid.

Principles of Drug Design (Theoretical Aspects). Traditional Analogue (QSAR) , Mechanism Based Approaches (Computer Aided Drug Design and Molecular Modeling)

VI-P-3 PHARMACEUTICAL CHEMISTRY-VII PRACTICAL (MEDICINAL CHEMISTRY-II)

Synthesis of selected drugs from the categories of drugs mentioned in the theory.

Books Recommended:

- 1. Foye, W.C., Principles of Medicinal Chemistry, Lea and Febiger, Philadelphia.**
- 2. Wolff , M.E. Ed., Burger's Medicinal Chemistry, John Wiley and Sons, New York.**
- 3. Hansch, C., Comprehensive Medicinal Chemistry, Pergarnon Press, Oxford**
- 4. Delagado, J.N. and Remers, W.A.R, Wilson and Giswold's Text Book of Organic, Medicinal and Pharmaceutical Chemistry, J.Lippincott Co., Philadelphia.**
- 5. Nogrady, T., Medicinal Chemistry-A Biochemical Approach, Oxford University Press, New York, Oxford.**
- 6. Kar, A., Medicinal Chemistry, Willey Eastern Ltd., New Delhi.**
- 7. Patrick, G., An Introduction to Medicinal Chemistry, Scientific Distributors, Mumbai.**
- 8. Malone, Dyson and Purey, May's Chemistry of Synthetic Drugs.**
- 9. Parimoo, P., Text Book of Medicinal Chemistry, CBS Publishers and Distributors, New Delhi.**
- 10. Thomas, G., Introduction to medicinal Chemistry, CBS Publishers and Distributors, New Delhi.**

VI-T-4 PHARMACOLOGY II

Pharmacology and pathophysiology of central nervous system:

- a. Neurohumoral transmission in the CNS
- b. General anaesthetics
- c. Alcohol and disulfiram
- d. Sedative, hypnotics, anti-anxiety agents and centrally acting muscle relaxants
- e. Psychopharmacological agents (anti psychotic anti-depressants, anti-maniacs and hallucinogens)
- f. Anti-epileptic drugs
- g. Anti-parkinsonian drugs
- h. Narcotic analgesics and antagonistics
- i. CNS stimulants
- j. Drug addiction and drug abuse

Drugs acting on the gastrointestinal tract:

- a. Antacids, anti-secretory and anti-ulcer drugs
- b. Laxatives and anti-diarrhoeal drugs
- c. Appetite stimulants and suppressants
- d. Emetics and anti-emetics
- e. Miscellaneous: Carminative, demulcents, protective, adsorbents, astringents, digestants, enzymes and mucolytics

Drugs acting on the haematopoietic system

- a. Hematinics
- b. Anti-coagulants, vitamin K and hemostatic agents

- c. Fibrinolytic and anti-platelet drugs
- d. Blood and plasma volume expanders

VI-P-4 PHARMACOLOGY II PRACTICALS

1. Study of routes of administration of drugs in mice/rats.
2. To study the effect of hepatic microsomal enzyme inhibition and induction on the pentobarbitone sleeping time in mice.
3. Experiments on central nervous system.
4. Pharmacology of the GIT - To study the anti-secretory and anti-ulcer activity of ranitidine in pylorus ligated rats.
5. Experiments on isolated preparations – To find out the strength of the given sample of an agonist(Acetylcholine, Histamine)
 1. Matching Assay.
 2. Two Point Assay.
 3. Three Point Assay.

Books recommended

1. **Hardmen, J.G., Limbired, L.E., Molinoss, P.B.,
Ruddon, R.W. and Gil, A.G., Goodman and Gillman's The
Pharmacological basis of Therapeutics, Pergamon Press.**
2. **Satoskar, R.S. and Bhandarkar, S.D., Pharmacology
and Pharmacotherapeutics.**
3. **Tripathi, K.D., Essentials of Medical Pharmacology**

4. **Kulkarni, S.K., Handbook of Experimental Pharmacology, Vallabh Prakashan, New Delhi.**
5. **Crossland, J and Thomson, J.H., Essential of Pharmacology, Harper and Row, Publishers, New York.**
6. **Craig, C.R. and Stitzel, R.R., Modern Pharmacology, Little Brown and Company.**
7. **Rang, M.P. , Dale, M.M. and Ritter, J.M., Pharmacology, Churchill Livingstone.**
8. **Paul, L., Principles of Pharmacology, Chamman and Hall.**
9. **Herfindal, E.T. and Hirschman, J.L., Clinical Pharmacy and Therapeutics, William and Wilkins.**
10. **Katzung, B.G., Basic and Clinical Pharmacology, Prentice Hall International.**

PHARMACEUTICS VIII

(HOSPITAL PHARMACY)

Organization and structure: Organization of a hospital and hospital pharmacy, responsibilities of a hospital pharmacist, pharmacy and therapeutic committee, budget preparation and implementation.

Hospital Formulary: Contents, preparation and revision of hospital formulary.

Drug Store, Management and Inventory Control:

- a. Organization of drug store, types of materials stocked, storage condition
- b. Purchase and inventory control-principles, purchase procedures, purchase orders, procurement and stocking.

Drug distribution systems in hospitals:

- a. Out patient dispensing, methods adopted.
- b. Dispensing of drugs to in-patients, types of drug distribution systems.
Charging policy, labeling.
- c. Dispensing of drugs to ambulatory patients.
- d. Dispensing of controlled drugs.

Central Sterile Supply Unit and Their Management: Types of materials for sterilization, packing of materials prior to sterilization, sterilization, sterilization equipment, supply of sterile materials.

Manufacture of sterile and nonsterile products: Policy making of manufacturable items, demand and costing, personnel requirements, manufacturing practice, master formula card, production control, manufacturing records.

Drug Information Service: Source of information on drugs, disease, treatment schedules, procurement of information, computerized services

(e.g. MEDLINE), retrieval of information, medication error.

Records and Reports: Prescription filling. Drug profile, patient, medication profile cases on drug interaction and adverse reactions, idiosyncratic case etc.

Nuclear Pharmacy: Introduction to radio –Pharmaceuticals, radio-active half life, units of radio activity, production of radio –Pharmaceuticals, methods of isotopic tagging, preparation of radio – isotopes in laboratory using radiation dosimetry, radio isotopes generators, permissible radiation dose level, radiation hazards and their prevention, specifications for radio – active laboratory.

Books Recommended

- 1. Allwodd M.C. and Fell J. T., Text book of Hospital Pharmacy, Blackwell Scientific Publication, Oxford.**
- 2. Hassan W. E., Lea and Febiger, Philadelphia Hospital Pharmacy**
- 3. Merchant H. S., Quadry J.S., Text book of Hospital Pharmacy, B. S. Shah Prakashan, Ahemdabad.**