

Pharm VFIFTH SEMESTER

V-T-1 PHARMACEUTICS-VII

(COSMETIC TECHNOLOGY)

Fundamentals of cosmetic sciences and structure and function of skin and hair.

Formulation considerations, preparation, packaging and evaluation of the following categories of cosmetics.

- 1. Face Preparations:** Face powder, Compact powder, Talcum powder, Face packs and Masks.
- 2. Skin Preparations :** Skin creams, Anti-wrinkle preparations, Barrier materials, Protective creams and gels, Vanishing creams, Cold creams, Cleanising creams, Emollient, Anti-perspirant / deodorant, Moisturising and foudation formulations. Bleaching creams, Night and Massage cream, Hand cream, Protective skin tonics, Skin moisturisers, Sun-screen, Suntan, and anti- sun burn preparations.
- 3. Shaving preparations :** Lather shaving stick, Lather shaving cream, Shaving foams, Shaving gels, Pre- and After shave lotions.
- 4. Shampoo and Bath preparations:** Clear liquid shampoo, Aerosol shampoo, dry shampoo, Acid-balanced shampoo, Egg shampoo, Bath oils, Foam baths.
- 5. Hair Preparations :** Hair tonics, Hair conditioners, Hair lotions, Hair sprays, Hair dressings, Hair setting lotions and creams, Hair dyes, Bleaches, Hair waiving, Hair straightners and Hair strengtheners.
- 6. Dentrifice :** Tooth powders, Tooth pastes, Solid dentrifice, Tooth brush and Denture cleansers.
- 7. Foot Preparations :** Foot powders, Foot sprays, Foot creams, Corn preparations and Athelete's foot preparation.
- 8. Manicure Preparations :** Nail polish, Nail lacquer and Nail bleach.
- 9. Herbal Cosmetics :** Cosmetics containing Aloe, Babul, Brahmi, Chandan, Cucumber, Haldi, Jatamansi, Khus, Mehandi, Neem, Reetha, Shikakai, Tulsi, Arnica, Amla, Bhringraj and Volatile oils.
- 10. Cosmetic for babies.**

11. Colored make-up preparations : Lipsticks, Rouge, Mascara, Eye make-up, Eye-liner, Eyebrow pencils.

V-P-1 PHARMACEUTICS-VII PRACTICALS

(COSMETIC TECHNOLOGY)

Preparation and packaging of face packs and masks, cold cream, vanishing creams, cleansing creams, after-shave lotions, acid-balanced shampoo and egg shampoo.

Preparation and evaluation of talcum powder, Face powder and Compact powder.

Preparation and evaluation of tooth powder, tooth paste and Denture cleansers.

Preparation and evaluation of hair conditioners.

Preparations and evaluation of herbal cosmetics.

Preparation and packaging of lipsticks and eye liners.

Preparation of liquid soaps and baby powders.

Books Recommended:

- 1. Sagarine, E., - Cosmetic Science and Technology, Vol. 1-3, John Wiley and Sons, New York.**
- 2. Balsams, M.S. and Sagarine, E., Cosmetics and Toiletries, Vol.1-3, John Wiley and Sons, New York.**
- 3. Mac Chesney, J.C., Packaging of Cosmetic and Toiletries, Newness-Butterworth, London.**
- 4. Jellinek, J.S., Formulation and Functions of Cosmetics, John Willey & Sons, New York.**
- 5. Thomssen, S. G., Modern Cosmetics, Universal Publishing Corporation, Bombay.**

V-T-2 PHARMACEUTICAL CHEMISTRY-V (BIOCHEMISTRY)

Biochemical organization of the cell and transport processes across cell membrane.

The concept of free energy, determination of charges in free energy system from equilibrium constant and reduction potential, bioenergetics, production of ATP and its biological significance.

Enzymes:

Nomenclature, Kinetics and its Mechanism of action, Mechanism of Inhibition, Isoenzymes, enzymes in technical diagnosis.

Co-enzymes:

Metals as coenzymes and their significance and Vitamins as coenzymes and their significance.

Carbohydrate Metabolism:

Conversion of Polysaccharide to Glucose 1-Phosphate, Glycolysis and Fermentation and their regulation, Gluconeogenesis and Glycogenolysis, metabolism of galactose and galactosemia, role of sugar nucleotide in biosynthesis, pentosephosphate pathway.

The Citric acid cycle:

The significance, reaction and energetics of cycle, amphibolic role of cycle, Glyoxalic Acid Cycle.

Lipid Metabolism:

Oxidation of fatty acids, Beta Oxidation and energetic, alpha oxidation, omega oxidation, Biosynthesis of Ketone bodies and their utilisation, Biosynthesis of saturated and unsaturated fatty acids and eicosanoids, phospholipids, sphingolipids.

Biological oxidation:

Redox Potential, enzymes and co-enzymes involved in oxidation reduction and its control. The respiratory chain, its role in energy capture and its control, energetic of oxidative phosphorylation, inhibitors of respiratory chain and oxidative phosphorylation, mechanism of oxidative phosphorylation.

Nitrogen & Sulphur Cycle:

Nitrogen fixation, ammonia assimilation, sulphur activation, sulphate reduction, incorporation of sulphur in organic compounds, release of sulphur from organic compounds

Metabolism of Ammonia and Nitrogen Containing monomers:

Nitrogen balance, biosynthesis of amino acids, catabolism of amino acids, conversion of amino acids to specialized products, assimilation of ammonia, urea cycle, metabolic disorders of urea cycle, metabolism biosynthesis, formation of bile pigment, hyperbilirubinemia, purine biosynthesis, purine nucleotide interconversion, pyrimidine biosynthesis, and formation of deoxyribonucleotides.

Biosynthesis of nucleic Acids:

Brief introduction to genetic organisation, organisation of mammalian genome, alteration and rearrangement of genetic material, biosynthesis of DNA and its replication, mutation, physical and chemical mutagenesis/ carcinogenesis, DNA repair mechanism, biosynthesis of RNA.

Genetic code and Protein synthesis:

Genetic code, Components of protein synthesis and inhibition of protein synthesis. Brief account of genetic engineering and polymerase chain reactions. Regulation of gene expression.

V-P-2 PHARMACEUTICAL CHEMISTRY-V (BIOCHEMISTRY) PRACTICAL

1. Qualitative and Quantitative chemical examination of Urine, Blood and Faeces.
2. Food Analysis – Analysis of Milk, Butter, Flour, Honey and Starch.
3. Systemic analysis of water for pharmaceutical purpose.
4. Separation of amino acids by two dimensional paper chromatography and gel electrophoresis.
5. Separation of lipids by TLC.
6. Separation of Serum proteins by electrophoresis on cellulose acetate.
7. Quantitative estimation of amino acids and proteins.
8. Determination of glucose.
9. Isolation and determination of RNA and DNA.

V-T-3 PHARMACEUTICAL CHEMISTRY-VI

(MEDICINAL CHEMISTRY-I)

Basic principles of medicinal chemistry, physicochemical and steric aspects (optimal, geometric and bioisosterism) of drug molecules and biological actions.

Drug Metabolism and Prodrug Concept

Drug receptor interaction including transduction mechanism and G proteins. The synthesis of the selected drugs, classification and mode of action, uses, SAR including physicochemical and steric aspects of the following category of drugs:

(A) Drugs acting at synaptic and neuromuscular junction sites

1. Cholinergics and Anticholinesterases.
2. Adrenergic hormones and Drugs;
3. Neuromuscular Blocking Agent.
4. Local Anaesthetics.

(B) Autocoids

1. Antihistamines.
2. Eicosanoids.
3. Non steroidal anti inflammatory agents, analgesic antipyretics.

(C) Vitamins

Vitamin A, Thiamine, Riboflavin, Folic Acid, Niacin, Panthotenic Acid, Pyridoxine, Cyanocobalamin, Vitamin C, Vitamin D, Vitamin E, Vitamin K.

V – P – 3 PHARMACEUTICAL CHEMISTRY-VI PRACTICALS

(MEDICINAL CHEMISTRY-I)

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

V-T-4 PHARMACOGNOSY-III

General techniques of biosynthetic studies and basic metabolic pathways. Introduction to biosynthesis of secondary metabolites of pharmaceutical importance. A brief introduction of chemical nature of phytoconstituents.

Radio – tracer techniques and utilization in biogenetic studies.

Phytochemical Screening: Preparation of extracts and different methods used for screening extracts for the presence of alkaloids, saponins, steroidal compounds, flavanoids, anthraquinones, phenolics, amino acids, etc.

Concepts of stereoisomerisms taking examples of natural products. Nature, distribution, classification, general methods of isolation and properties of alkaloids and terpenoids.

Chemistry, biogenesis and pharmacological activity of atropine, reserpine, ephedrine, ergometrine, quinine, morphine, digitoxin, sennosides, diosgenin, sarsapogenin, menthol, citral, taxol, rutin and artemisine.

Systematic pharmacognostical study of drugs like; Tobacco, Belladonna, Hyoscyamus, Datura, Coca, Withania, Cinchona, Ipecac, Opium, Ergot, Rauwolfia, Vinca, Nuxvomica, Physostigma, Pilocarpus, Veretrum, Kurchi, Ephedra, Solanam, Tea, Colchicum, etc.

V-P-4 PHARMACOGNOSY-III PRACTICALS

1. Identification and evaluation of crude drugs mentioned in theory using morphologic, microscopic and chemical methods.
2. Isolation of some phytoconstituents from natural sources.

Books recommended

- 1. Trease, G.E. and Evans, W.C., Pharmacognosy, Bailliere Tindall, Eastbourne, U.K.**
- 2. Tayler, V.C., Brady, L.R. and Robers, J.E., Pharmacognosy, Lea and Febiger, Philadelphia.**
- 3. Shah, C.S. and Quadry, J.S., A text book of Pharmacognosy, B.S. Shah Publishers, Ahmedabad.**
- 4. Kokate, C.K., Purohit, A.P. and Gokhale, S.B., Pharmacognosy, Nirali Prakashan, Pune.**
- 5. Indian Pharmacopoeia, Ministry of Health and Family Welfare, Govt. of India, New Delhi.**
- 6. Wallis, T.E., Text Book of Pharmacognosy, Jand A Churchill Limited, London.**

V-T-5 PHARMACOLOGY I

General Pharmacology

- a. Introduction to pharmacology, sources of drugs, dosage forms and routes of administration, mechanism of action, combined effects of drugs, factors modifying drug action, tolerance and dependence, pharmacogenetics.
- b. Absorption, distribution and excretion of drugs, principle of basic and clinical pharmacokinetics adverse drug reactions and treatment of poisoning, ADME drug interaction, bioassay of drugs and biological standardization, discovery and development of new drugs.

Pharmacology of Peripheral Nervous System

- a. Neurohumoral transmission (autonomous and somatic)
- b. Parasympathomimetic, parasympatholytic, sympathomimetics, adrenergic receptors and neuron blocking agents.
- c. Neuromuscular blocking agents
- d. Local anaesthetic agents

Autocoids

- a. Histamine, 5- HT and their antagonists.
- b. Prostaglandins, Thromboxanes and Leukotrienes.
- c. Pentagastrins, Cholecystokinin and Angiotensin.

Analgesic, Antipyretic, Anti-inflammatory and Anti-Gout Drugs:

Drugs acting on Respiratory System and Pathophysiology of respiratory system:

- a. Anti-asthmatic drugs including bronchodilators
- b. Anti-tussives and expectorants
- c. Respiratory stimulants

V-P-1 PHARMACOLOGY I PRACTICALS

1. Introduction to experimental Pharmacology. Preparation of different solutions for experiments. Common laboratory animals and anaesthetics used in animal studies. Various routes of administration of drugs in rodents.
2. Evaluation of analgesics, anti-inflammatory activity and motor activity, muscle relaxant activity .
3. To study the effects of autonomic drugs on rabbit's eye
4. To study the effects of various agonists and antagonists and their characterization using isolated preparations like frogs rectus abdominus and isolated guinea pig ileum.
5. To record CRC of Acetylcholine using rectus abdominus muscle preparations of frog.
6. To record CRC of Histamine and guinea pig ileum preparations.

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 Riter, 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.**

Katzung, B.G., Basic and Clinical Pharmacology