

**PHARMACEUTICS-VI (BPH501)**  
**(COSMETIC TECHNOLOGY)**

**Unit – I**

**Fundamental of cosmetic science:** Structure and functions of skin. Formulation considerations, preparation, packaging and evaluation of the following categories of cosmetics.

**Face Preparation:** Face powder, Compact powder, Talcum powder, Face packs.

**Skin Preparation:** Skin creams, Anti-wrinkle preparations, Vanishing creams, Cold creams, Cleansing creams, all-purpose creams, Anti-perspirant, / deodorant, Moisturizing and foundation formulation. Bleaching creams, Night and Massage creams, Hand creams.

**Protective creams and gels:** Sun-screen, Suntan, and Anti-sun burn preparation.

**Unit –II**

**Structure and functions of hair & Hair Preparations:** Formulation considerations, preparation, packaging and evaluation of the following categories of cosmetics.

**Hair Preparations:** Hair tonics, Hair conditioners, Hair lotions, Hair sprays, Hair dressings, Hair setting lotions and creams, Hair dyes, Bleaches, Hair waving, Hair straighteners .

**Shampoo and Bath preparations:** Clear liquid shampoos, Dry shampoos, Acid-balanced shampoos, Egg shampoos, Anti-dandruff Shampoos, foam baths.

**Unit –III**

**Herbal Cosmetics:** Cosmetics containing Aloe, Babul, Brahmi, Chandan, Cucumber, Haldi, Jatamansi, Khus, Mehandi, Neem, Reetha, Shikakai, Tulsi, Arnica, Bhringraj and Volatile oils.

**Unit-IV**

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

**Manicure Preparation:** Nail polish, Nail lacquers and Nail bleaches.

**Cosmetic for babies.**

**Unit-V**

**Dentifrices:** Tooth powders, Tooth pastes, Denture cleansers.

**Shaving Preparation:** Lather shaving stick, Lather shaving creams, Shaving foams, Shaving gels, pre-and after shave lotions.

**Text Books**

1. M. S. Balsam & Edward Sagarin (Eds.), Cosmetic Science and Technology, Vol. 1-3, Krieger Publishing company. Florida.
2. Jellinek, J.S. Formulation and Functions of Cosmetics, John Willey & Sons, New York.
3. R. K. Nema, K. S. Rathode, B.K. Dubey, Text Book of Cosmetics, CBS- Publishers & distributors, New Delhi.
4. Sunil Nanda, Arun Nanda & R.K. Khar, Cosmetic Technology, Birla publications Pvt. Ltd., Delhi.
5. B. M. Mithal and R.N. Saha, A handbook of cosmetics, Vallabh Prakashan, Delhi.
6. S.C. Bhata, Perfumes, soaps, Detergents and Cosmetics Vol. 1 & 2, CBS Publishers and Distributors, New Delhi.

### Reference Books

1. P.P. Sharma, Cosmetics- Formulation, Manufacturing & Quality control, Vandana Publications Pvt. Ltd, Delhi
2. Hildo Butler (Ed.), Poucher's Perfumes, Cosmetics & Soaps, Kluwer Academic Publishers, The Netherland.
3. E.G., Thomssen, Modern Cosmetics, Universal Publishing Corporation, Bombay.
4. Mac Chesney, J. C., Packaging of Cosmetic an Toiletries, Newness- Butterworth, London

### Practical

#### LIST OF PRACTICALS:

1. Prepare, Pack and Evaluate Compact Powder.
2. Prepare and Face pack
3. Prepare and Evaluate Talcum Powder.
4. Prepare and Evaluate Vanishing Cream.
5. Prepare and Evaluate Cold Cream.
6. Prepare and Evaluate Cleansing Cream.
7. Prepare and Evaluate Sunscreen preparation.
8. Prepare and Evaluate After shave lotion.
9. Prepare and Evaluate Lather shaving cream.
10. Prepare and Evaluate Simple shampoo (Soap based).
11. Prepare and Evaluate Acid balanced shampoo.
12. Prepare and Evaluate Egg shampoo.
13. Prepare and Evaluate Anti-dandruff Shampoo..
14. Prepare and Evaluate Tooth Powder.
15. Prepare and Evaluate Tooth Paste.
16. Prepare, Pack and Evaluate Lipsticks.
17. Prepare, Pack and Evaluate Nail lacquer.
18. Prepare and submit Herbal preparations. (Atleast 5 different types)

**PHARMACEUTICS - VII (BPH502)**  
**(DISPENSING, COMMUNITY AND HOSPITAL PHARMACY)**

**UNIT-I**

Dispensing Pharmacy: Prescription, Handling of prescription, Sources of errors in prescription, Care required in dispensing prescriptions. Brief introduction of commonly used Latin terms in prescription.

General Dispensing Procedures including labeling of dispensed products.

**UNIT-II**

Principles involved and procedures adopted in dispensing, compounding container, storage, dose, some special label conditions (if any)- Powders, Tablets, Capsules, Solutions, Mixtures, Suspensions, Emulsions, Lotions, Liniments, Ophthalmic, Suppositories.

**UNIT-III**

Incompatibility in Prescription: Physical, Chemical and Therapeutic incompatibilities, Incompatibility of common occurrence and their correction.

Posology: Basis of posology, Detection of over doses in prescription, knowledge of prophylactic and therapeutic doses with route of administration.

**UNIT-IV**

Community Pharmacy: Organization and structure of retail and wholesale drug stores, Legal requirements for establishment and maintenance. Dispensing of proprietary products, Maintenance of records of retail and wholesaler, Patient counseling, Role of Pharmacist in community health care and education, Hazards of medication, Inventory control.

**UNIT-V**

Hospital Pharmacy: Organization and structure of a hospital pharmacy, responsibilities of Pharmacist in PTC, Drug monitoring and drug information.

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

**LIST OF PRACTICALS:**

1. Prepare and Dispense Simple Powder.
2. Prepare and Dispense Compound Powder.
3. Prepare and Dispense Simple Tablet.

4. Prepare and Dispense effervescent granules.
5. Prepare and Dispense Dusting Powder.
6. Prepare and Dispense Simple Mixture containing Soluble substances only.
7. Prepare and Dispense Emulsion.
8. Prepare and Dispense Emulsion containing Volatile oils.
9. Prepare and Dispense Calamine lotion.
10. Prepare and Dispense turpentine liniment.
11. Prepare and Dispense prescription possessing Physical Incompability (Incomplete Solution).
12. Prepare and Dispense prescription possessing Physical Incompability (Precipitation).
13. Prepare and Dispense prescription possessing Chemical Incompability (Alkaloidal salts with alkaline substances).
14. Prepare and Dispense prescription possessing Chemical Incompability (Alkaloidal salts with soluble iodides).
15. Prepare and Dispense prescription possessing Chemical Incompability (Evolution of carbon dioxide).

**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. J.S. Qadry, R.K. Goyal & R.K. Parika, Merchant & Qadry's a text book of Hospital Pharmacy, B.S. Shah Prakashan, Ahmedabad.
4. Pratibha Nand & R.K. Khar, Text Book of Hospital & Clinical Pharmacy, Birla Publications Pvt Ltd., Delhi.
5. S.J. Carter (Ed.), Cooper & Gunn's Dispensing for Pharmaceutical Students, CBS Publishers & Distributors, New Delhi.
6. R.M. Mehta, Dispensing Pharmacy, Vallabh Prakashan, Delhi.
7. S.N. Sharma & N.K. Jain, the Concise Pharmaceutical Dispensing, Prakash B. Printers, Baroda.
8. N.K. Jain & G.D. Gupta, Modern Dispensing Pharmacy, PharmaMed Press, Hyderabad.
9. E.W. Martin, Dispensing of Medications (Formerly Husa's Pharmaceutical Dispensing) Mack Publishing Company, Eastern Pa.

**PHARMACEUTICAL CHEMISTRY-VI (BPH503)**  
**(MEDICINAL CHEMISTRY- I)**

**UNIT - I**

**Basic Principles of Medicinal Chemistry:** Physico-chemical aspects (Optical, geometric and bioisosterism) of drug molecules and biological action; Drug receptor interaction including transduction mechanisms.

**Brief concept on QSAR:** Free Wilson model, Hansch analysis – its derivation and discussion on different parameters like electronic parameters, steric factor, and partition coefficient. Comparison between Free Wilson model and Hansch analysis, Molecular Connectivity Index.

**UNIT - II**

**Drug metabolism:** Phase I (biotransformation reactions), phase II (conjugation reactions), factors affecting drug metabolism.

**Prodrug:** Basic concept and its application.

**UNIT - III**

**Classification, mode of action, uses and structure activity relationship of the following classes of drugs.**

**Drugs affecting adrenergic mechanism:** Adrenergic receptors, biosynthesis of Catecholamines, chemical classification along with structures, S.A.R of adrenergic drugs, adrenergic agonists, adrenergic blockers.

**Drugs affecting cholinergic mechanism:** Introduction, SAR, cholinergic receptors, study of cholinergic agonists, indirectly acting cholinergic agonists, cholinergic blocking agents, and neuromuscular blocking agents.

**Local Anesthetics:** Introduction, chemical classification, ideal requirements, mode of action, SAR, structures of important local anaesthetics, metabolism and synthesis of benzocaine, procaine, lidocaine, tetracaine and cinchocaine.

**UNIT - IV**

**Autacoids:**

(i) **Antihistamines:** Diphenhydramine, Mepyramine, Chlorpheniramine, Promethazine, Chlorcyclizine, Cimetidine, Ranitidine.

(ii) **Eicosanoids:** Occurrences, Chemical nature, Medicinal applications

(iii) **Analgesic, Antipyretics, Anti-inflammatory (non-steroidal) agents:** Aspirin, Paracetamol, Ibuprofen, Phenylbutazone, Naproxan, Diclofenac sodium.

**UNIT - V**

**Drugs affecting the Respiratory System:** Anti-asthmatics, Expectorants and Anti-tussive Agents (Salbutamol, Terbutaline, Acetylcysteine, Bromhexine Hydrochloride, Guaiifensin and Levopropoxyphene Napsylate).

### Practical

1. Separation and Qualitative analysis of Organic binary mixtures containing having salt, acidic, phenolic, amphoteric, basic and neutral nature (Solid + Solid (Solid), Solid + Solid (Eutectic)) with derivative preparations.
2. Monographs of selected official drugs including identification tests and tests for purity.
3. Synthesis of selected drugs and intermediates from the course content
  - (i) Synthesis of Phenyl benzoate
  - (ii) Synthesis of Methyl Pyrazolone
  - (iii) Synthesis of Phenytoin
  - (iv) Synthesis of Fluorescein
  - (v) Synthesis of Benzimidazole

### MEDICINAL CHEMISTRY – I

#### Reference Books:

1. Wilson and Gisvold's Text book of Organic, Medicinal and Pharmaceutical Chemistry, Lippincott-Raven Publishers - New York, Philadelphia.
2. William.O. Foye's, Principles of Medicinal Chemistry, B.I.Waverly Pvt. Ltd., New Delhi.
3. Burgers, Medicinal Chemistry, M.E.WeHy, Med.Chemistry M.E.
4. Walfred Johnwiley and Sons, Wiley-interscience Publication, New York, Toronto.
5. Pandeya N S "A Text book of Medicinal Chemistry" Vol. I and II , S.G. Publisher, 6, Dildayal Nagar, Varanasi -10
6. Indian Pharmacopoeia, 1996, 2007, 2010, The Controller of Publications, Civil Lines, Delhi - 54.
7. Kar, A., Medicinal Chemistry, Willey Eastern Ltd., New Delhi.
8. Vogel's Text book of Practical Organic Chemistry, ELBS/ Longman, London
9. Singh, H., Kapoor, V.K. Medicinal and Pharmaceutical Chemistry, Vallabh Prakashan New Delhi.

**PHARMACOGNOSY - III (BPH504)**

**Unit-I**

**Biosynthesis: Introduction to biogenesis**

- A. Employment of Radio-tracer techniques in Biogenetic studies.
- B. A brief account of primary and secondary metabolite's production from carbon metabolism in plants.
- C. Study of Calvin cycle, TCA cycle, Shikimic acid pathway, acetate hypothesis, isoprenoid pathway.
- D. Biosynthesis of carbohydrates, lipids and volatile oils.

**Unit-II**

**Extraction, Isolation and Chemistry of**

- A. Glycosides - Digitoxin, Diosgenin & Sarasapogenin
- B. Lignans- Secoisolariciresinol diglycoside
- C. Quassinoids- Bruceantin
- D. Flavonoids- Rutin, Quercetin

**Unit-III**

**Extraction, Isolation and Chemistry of Alkaloids**

- A. Atropine & related compounds
- B. Quinine, reserpine, morphine, papaverine, ephedrine, ergot
- C. Vinca Alkaloids.
- D. Extraction, Isolation and Chemistry of Xanthine bases: Caffeine, theophylline and theobromine.

**Unit-IV**

**Extraction:** Theory of mass transfer, maceration, percolation, Soxhlet extraction and super critical fluid extraction.

Extraction, Isolation and Chemistry of Terpenoids: Camphor, Menthol, Citral,  $\beta$ - Carotene,  $\alpha$ -Tocopherol,  $\alpha$ -Pinene.

**Unit-V**

**Study of Toxic Drugs:** Allergens, hallucinogens, narcotics, mycotoxins, toxic mushrooms and Indian toxic plants.

**A brief introduction to natural plant bitters and sweeteners.**

**LIST OF PRACTICALS:**

1. Identify Colchicum, Ipecac and Vinca leaves morphologically.
2. Identify Aconite, Hyoscyamus and Withania leaves morphologically.
3. Perform morphological, microscopic and chemical evaluation of Tobacco.
4. Perform morphological, microscopic and chemical evaluation of Withania.
5. Perform morphological, microscopic and chemical evaluation of Cinchona bark.
6. Perform morphological, microscopic and chemical evaluation of Rauwolfia root.
7. Perform morphological, microscopic and chemical evaluation of Nux vomica seeds.
8. Perform morphological, microscopic and chemical evaluation of Ephedra.
9. Perform morphological, microscopic and chemical evaluation of Kurchi bark.
10. Isolate Nicotine from tobacco.
11. Isolate Caffeine from tea leaves.
12. Isolate Quinine from cinchona.
13. Isolate alkaloids from nux vomica seeds.
14. Isolate starch from potatoes.
15. Perform morphological characterization like type of stomata and calculate the stomatal index, vein islets, vein termination numbers, microscopic and chemical evaluation of Datura leaves.
16. To identify and evaluate the given sample of Colchicum corm by morphological, microscopical and chemical evaluation)

**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.  
Wallis, T.E., Text Book of Pharmacognosy, Jand A Churchill Limited, London

**PHARMACOLOGY-II (BPH505)**

**Pathophysiology of CNS Disease & Pharmacology of drug used to treat them**

**UNIT-I**

- (i) Alcohol and alcoholism
- (ii) Sedatives and hypnotics
- (iii) Antianxiety agent & centrally acting muscle relaxants
- (iv) Anticonvulsants
- (v) CNS stimulants
- (vi) Opioid Analgesic & antagonist
- (vii) Local anesthetics & General anesthetics

**UNIT-II**

**(A) Psychopharmacological agents**

- (i) Antipsychotics
- (ii) Antidepressants
- (iii) Antimaniacs
- (iv) Hallucinogens

**(B) Drugs used in neurodegenerative diseases**

- (i) Parkinson's Disease
- (ii) Alzheimer's Disease

**UNIT-III**

**Autocoids**

- (i) Histamine, bradykinin 5-HT and their antagonists.
  - (ii) Prostaglandins, leukotrienes and platelet activating factors.
- Analgesic, Antipyretic, Anti-inflammatory and Anti-Gout Drugs:

**UNIT-IV**

**Pharmacology of drugs acting on Respiratory System**

- (i) Drug therapy of asthma
- (ii) Anti-tussives, expectorant and mucolytic agent.

**UNIT-V**

**Pharmacology of drugs acting on GIT**

- (i) Drugs used in ulcers
- (ii) Drugs for treatment of diarrhea and constipation.
- (iii) Emetic and anti-emetics.

**PRACTICAL:**

1. Bioassay for acetylcholine/histamine using isolated organ preparations (rat ileum/rat duodenum/rat colon/rat fundus/guinea pig ileum/guinea pig tracheal chain preparation/goat ileum)
  - a) Matching bioassay or Bracketing bioassay
  - b) Interpolation bioassay or graphical bioassay
2. Study the CNS depressants using cornea and pinna reflex test.
3. Study CNS stimulants by evaluation of locomotor activity (Actophotometer)
4. Study Central muscle relaxants using Rota rod apparatus
5. Study lenticular opacity produced by opioid analgesics in rodents.
6. Study anticonvulsant effect of some drugs using maximum electroshock method and Chemical-induced convulsion method.
7. Study antianxiety effect of some drugs using elevated plus maze test or social interaction test or novelty suppressed feeding test in rodents.
8. Evaluate hypnotic activity of a drug by employing potentiation of thiopental induced sleeping time paradigm.
9. Study antipsychotic effect of some drugs using catalepsy test or inhibition of amphetamine stereotypy in rodents.  
Study intravenous anesthetics using righting reflex test.

**BOOKS RECOMMENDED**

- 1) Herfindal, E.T., Gourley, D.R., (eds.) (2000) Textbook of therapeutics Drug and disease management. 7th ed. Baltimore: Lippincott Williams and Wilkins
- 2) Hardmen, J.G., Limbird, L.E., Gilman A.,G., (eds.) (2001) Goodman and Gilman's The pharmacological basis of therapeutics. 10th ed. USA: The McGraw Hill Companies
- 3) Kumar, V., Abbas, A.K., Fausto, N., (eds.) (2004) Robbins and Cotran Pathologic basis of disease. 7th ed. Pennsylvania: Saunders