Rajiv Gandhi Proudyogiki Vishwavidalaya, Bhopal (M.P.)

B. PHARM.-VII SEMESTER

PY-701- Pharmaceutics –VIII (Pharmaceutical Technology –I)

Formulation considerations, technology involved, equipment (machine) employed, problems to be encountered, packaging evaluation and CMP (India, WHO & USFDA) requirements of the following dosage forms.

1. Solid Dosage Forms- Tablets, Tablet coatings and Capsules.
2. Liquid Dosage Forms- Liquid Orals, Dry Syrups.
4. Sterile Dosage Forms- Parenteral ( Small Volume Parenterals & Large Volume Parenterals ) and ophthalmic Preparations.
5. Pharmaceutical Aerosols

Blood Products and Plasma Substitutes:
Collection, processing and storage of whole human blood, concentrated human RBC, dried human plasma, human normal immunoglobulin, plasma substitutes, ideal requirements, PVP, Dextran, etc. for control of blood pressure,
Surgical products:
Definition, surgical cotton, surgical gauzes, bandages, adhesive tapes, absorbable and non absorbable sutures, ligatures and catguts, Medical prosthetics and organ replacement materials.

Books Recommended
4. Pharmacopoeia Of India, Ministry of Health and family Welfare, Govt. of India, New Delhi.

List of Practicals
1. Prepare and evaluate Paracetamol Compressed Tablets.
2. Prepare and evaluate Effervescent Tablets of Aspirin.
3. Prepare and evaluate Dispersible tablets of Diclofenac Sodium.
4. Perform the Sugar Coating on the given sample of Tablets.
5. Perform the Film Coating on the given sample of Tablets.
6. Perform the Enteric Coating coating on the given sample of Tablets.
7. Prepare and evaluate Tetracycline HCL Capsules.
8. Prepare and evaluate Antacid Suspension.
9. Prepare and evaluate B-Complex Syrup.
11. Prepare and evaluate Castor Oil Emulsion.
12. Prepare and evaluate Diclofenac Sodium Suppositories.
13. Prepare and evaluate Vaporizing Ointment.
14. Prepare and evaluate Non-Staining Iodine Ointment containing Methyl Salicylate.
15. Prepare and evaluate Antiseptic Cream.
16. Prepare and evaluate Diclofenac Gel.
17. Prepare and evaluate Ciprofloxacin Eye Drop.
20. Perform the Sability Studies of given sample of Paracetamol Tablets.
PY-702- Pharmaceutics –IX (BioPharmaceutics & Pharmacokinetics)

Introduction to biopharmaceutics and pharmacokinetics development and their role in drug formulation.

Biopharmaceutics

Definition, passage of drugs across biological barrier, Physiochemical, Biological and Pharmacaceutical factors influencing biopharmaceutical performance of drugs.

1. Gastrointestinal absorption of drugs: Passage of drugs across biological membranes, nature of biological membranes, gastrointestinal absorption mechanisms.
   - Drug Excretion: Routes of drug excretion, renal excretion of drugs, factors affecting renal excretion, biliary and salivary excretion of drugs.

Pharmacokinetics

Absorbtion, distribution metabolism and excretion of drugs, fluid compartment and circulatory system, protein binding, significance of plasma drug concentration measurement.

Compartment Models


Clinical Pharmacokinetics

Urinary excretions, computation of pharmacokinetic parameters from urine data, haepetic clearance, biliary excretion, excretion ratio, dosage regimen adjustment in patients with and without renal failure, pharmacokinetic drug interaction and their significance in combination therapy.

Bioavailability and Bioequivalence

Bioavailability and Bio-equivalence, Federal requirements, Methods of determination of bioavailability using blood level and urinary excretion data, design and evaluations, bioavailability assessment.
Books recommended

4. Leepeter I.D., Pharmacokinetic analysis
6. Venkaateshwaru v , Biopharmaceutics and pharmacokinetics, phared puss, Hydrabad.
7. Wagner-pharmacokinetics for the pharmastudies.
8. Dhachinamoorthi D: Biopharmaceutics and pharmacokinetics : A practical mannd
9. Shargel : pharmacokinetics & Biopharmacokinetics & Biopharmaceutics

List of Practicals

1. Determine the percentage protein binding of the given drug.
2. Determine oral bioavailability of the given drug/formulation by urinary excretion method using animal model.
3. Perform bioequivalence study of two different brands of the marketed tablets of the given drug using animal model.
4. Determine the rate of in-vitro absorption of the given drug using everted intestinal sack.
5. Determine the effect of different pH condition on solubility of a weekly acidic or basic drug and study PH partition hypothesis.
6. Establish IVIVC for the given sample of drug.
7. Calculate elimination rate constant and elimination half life of given excretion data by sigma minus method.
8. Calculate elimination rate constant and elimination half life of the given drug data administered by i.v. bolus injection represented by one compartment model.
9. Calculate various pharmacokinetic parameters from the given data generated after single extra vascular administration of drug represented by one compartment model.
10. Calculate various pharmacokinetic parameters from the given data obtained by using two compartment open model.
PY-703- Pharmaceutical Chemistry –VIII (Medicinal Chemistry –III)

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

**Drugs acting on Cardiovascular system :**
- Cardiac Glycosides
- Antiarrythmic drugs
- Antianginal drugs
- Antihypertensive drugs
- Antihyperlipidimic drugs

**Drugs acting on Urinary system :**
- Diuretics

**Chemotherapeutic Agents**
- Anti metabolites(Including Sulpha durgs)
- Anti viral & Anti HIV,
- Anti neoplastic,
- Anti malarials,
- AntiProtozoal
- Anti tubercular,
- Anthelmintics,
- Antifungals
- B-lactum antibiotics
- Aminoglycosides
- Protein synthesis inhibitors (Tetracyclins,chloramphenicol,Macrolides)
- Miscellaneous antibiotics (Bacitracin, Glycopeptides, Polymyxins)
- Immuno- suppressive

**Drugs affecting uterine motility**
- Oxytocins (including prostaglandins and Ergot alkaloids).

**Books Recommended:**
PY-704 - Pharmaceutical Biotechnology

Historical Development:

Immunology and Immunological Preparations:

Enzyme Immobilization –
Techniques of Immobilization of enzymes, Kinetics and factors affecting enzymes kinetics, Enzymes based sensors, Study of enzymes such as Hyaluronidase, Penicillinase, Streptokinase, Amylases etc. Immobilization of bacteria and plant cells, Applications of Immobilization.

Genetic Recombination:
Transformation, Conjugation, Transduction, Protoplast fusion, Gene cloning and their applications, Monoclonal antibodies and hybridoma technology, Recombinant DNA technology: Concepts, Methodology and Pharmaceutical applications. Study of drugs produced by biotechnology such as Activase, Humulin, Humatrope, Introne A, Monoclate, Orthoclone OKT3, Referon-A, Recombivax HB etc. Drug delivery systems in Gene therapy.

Microbiological Transformation –

Industrial Biotechnology –
Historical development, Fermenter and its design, Control of different parameters in fermentation process, Isolation of mutants, Use of mutagenic agents, Factors in influencing rate of mutation. Design of fermentation process, Fermentative, production of Alcohol, Acetic acid, Penicillin, Streptomycin, Riboflavin, Vitamin B12.

List of Practicals

1. Detect the presence of the amylase enzyme in saliva.
2. Isolate the DNA from cauliflower.
3. Perform VDRL test for the given sample of blood.
4. Isolate the phospholipid from egg yolk.
5. Perform WIDAL test for the given sample of blood.
6. Perform DOT ELISA test of the given sample of blood.
7. Isolate the total RNA from yeast tablet.
8. Immobilize the given enzyme by adsorption method using calcium alginate beads.
PY-705- Pharmacology – IV (Clinical & Drug Interactions)

Chemotherapy of Microbial Diseases

General principles
Synthetic organic antimicrobials (Sulphonamides, quinolones etc.)
B-lactum antibiotics
Aminoglycosides
Protein synthesis inhibitors (Tetracyclins, chloramphenicol, Macrolides)
Antitubercular drugs, antileptotic drugs, antiprotozoals, anthelmintics, antifungals
Antiretroviral and antiviral drugs
Miscellaneous antibiotics (Bacitracin, Glycopeptides, Polymyxins)

Chemotherapy of cancer and immunosuppressive agents

Basic concepts of Pharmacotherapy
Individualization of drug therapy: Clinical pharmacokinetic and pharmacodynamics
Drug use during pregnancy, Pediatrics and Geriatrics
Adverse drug reactions and drug induced diseases
Drug interactions
Therapeutic drug monitoring

Clinical Toxicology
Definition of poison
General principles of treatment of poisoning
Treatment of opioid, barbiturate, organophosphorous, and atropine poisoning
Heavy metals and heavy metal antagonists

BOOKS RECOMMENDED
12) Curry – Drug disposition and pharmacokinetics with a consideration of pharmacokinetics with a consideration of pharmacological and clinical relationships, 3rd edn., pharmumed pre
13) Kenakin Terry P: A pharmacological Primer – theory applications & methods, pharma med prre