



East Point Campus, Jnana Prabha, Virgo Nagar Post,  
Bengaluru – 560049, Karnataka

**QUESTION BANK**  
**M Pharmacy**  
**PHARMACEUTICS**  
**Semester-II**



East Point Campus, Jnana Prabha, Virgo Nagar Post,  
Bengaluru – 560049, Karnataka

# **Molecular Pharmaceutics**

## **(Nano Technology & Targeted DDS)**

### **(NTDS)**

### LONG ESSAY 7.5 MARKS

#### **UNIT I :Target Drug Delivery System**

1. What are the events and biological process involved in drug targeting?
2. Explain the concepts, events and biological processes involved in drug targeting.
3. What do you mean by ligand mediated targeting?
4. Explain the blood brain barrier? What are the factors affecting transport across The blood brain barrier?
5. What are the ideal properties of carrier?
6. Write a note on tumour targeting.
7. Explain the cell biology and anatomy of blood brain barrier.
8. Describe in detail invasive methods to brain targeting.
9. What are the different types of targeting? Explain first order and second order targeting.
10. What do you mean by ligand mediated targeting?
11. Describe in detail different methods of tumour targeting?

#### **UNIT II: Targeting Method**

1. Discuss the methods for the preparation of phytosomes.
2. Explain the methods of preparation and evaluation of nanoparticles.
3. Explain about liposomal gene delivery system.
4. Write the methods for the preparation and applications of (a) Phytosomes (b) Electrosomes.
5. Explain the methods of preparation and evaluation of liposomes.
6. Explain the methods of preparation and evaluation of nano particles.
7. Write about aquasomes.
8. What are niosomes? Describe in detail methods of preparation and characterization of niosomes.
9. Explain detail about aquasomes.
10. Give a brief account on phytosomes.
11. Classify different methods of preparation of nanoparticles?
12. Explain in detail different types of preparation of polymeric nanoparticles.
13. What are niosomes ? What are the differences between niosomes and liposomes.
14. Explain any five methods of preparation of niosomes.

### **UNIT III: Microcapsule / Microspheres**

1. Describe in detail about various methods of preparation of microspheres.
2. Define microspheres. Write in detail preparation and evaluation methods of microspheres.
3. What are aerosols? Explain various propellants used in the manufacturing of aerosols.
4. Describe in detail evaluation methods of nasal drug delivery system.
5. Explain the methods for the preparation and evaluation of microspheres.

### **UNIT IV: Pulmonary Drug Delivery System**

1. Write about methods of preparation and evaluation of aerosols.
2. Explain the factors influencing intranasal drug delivery.
3. Explain the nebulizers with suitable diagrams.
4. What are the factors influencing pulmonary drug delivery?
5. Discuss in detail about dry powder inhaler.
6. What are aerosols? Explain various propellants used in the manufacturing of Aerosols.
7. Explain intranasal insitu gels.
8. What are aerosols. What are the different types of containers used for aerosols?
9. Explain the various evaluation methods to evaluate aerosols.
10. Mention the advantages of intra nasal drug delivery system.
11. Explain in detail different types of intra nasal formulation and how to evaluate the same?

### **UNIT V: Nucelic Acid based Therapeutic Delivery System**

1. Explain about bone marrow transplantation in ex-vivo gene therapy.
2. Explain the applications of monoclonal antibodies.
3. Explain about liposomal gene drug delivery.
4. Write various diseases treated using gene therapy.
5. Explain about therapeutic antisense molecules.
6. Describe hybridoma technology for production of monoclonal antibodies.
7. How will you characterize monoclonal antibodies?
8. Define gene therapy. Explain viral and non viral gene transfer methods.



East Point Campus, Jnana Prabha, Virgo Nagar Post,  
Bengaluru – 560049, Karnataka

9. Explain aptamers as drugs of future.
10. Describe in detail preparation of monoclonal antibodies. Mention few marketed preparations.
11. Write a note on: (a) Aptamers (b) Liposomal gene drug delivery system



East Point Campus, Jnana Prabha, Virgo Nagar Post,  
Bengaluru – 560049, Karnataka

# **Advanced Biopharmaceutics and Pharmacokinetics**

### **LONG ESSAY 7.5 MARKS**

#### **UNIT I: Drug Absorption from the Gastrointestinal Tract**

1. Explain various mechanism of drug absorption.
2. Explain pH partition hypothesis and its limitations.
3. Explain the influence of gastric emptying and intestinal transit time on absorption of drug.
4. Explain various pharmaceutical factors affecting drug absorption.
5. Discuss Noye's whiteys equation of drug dissolution process.
6. Define absorption. Discuss in detail the mechanism of drug absorption.
7. Explain biological effect of drug absorption.
8. Discuss about GIT with respect to drug absorption.
9. In detail about active transport of drug absorption.
10. Discuss physico-chemical properties of a drug considered in drug product design

#### **UNIT II: Biopharmaceutic Considerations in Drug Product Design and In Vitro Drug Product Performance**

1. Discuss in detail in-vitro, in-vivo correlation. Explain briefly dissolution profile comparisons.
2. Describe the in vitro drug dissolution testing models. Explain their merits and limitations.
3. Discuss various factors to be considered in the design of a drug product.
4. Discuss the various official methods of drug dissolution.
5. Explain the different theories of dissolution process.
6. Write a detailed note on in vitro-in vivo correlation.
7. What are different compendial methods of dissolution.
8. Enumerate different categories of in vitro-in vivo correlation regarding drug product performance.
9. Describe compendial methods of dissolution testing.
10. Explain formulation factors affecting drug product performance

### **UNIT III: Pharmacokinetics**

1. Explain one compartment model with extra vascular route of administration along with various pharmacokinetic parameters.
2. Define and classify compartment models. Discuss briefly the significance and limitations of compartment modelling.
3. Explain the pharmacokinetics of drug given by IV bolus, which follows one compartment open model.
4. Discuss in detail one compartment open model for a drug administered as IV infusion. Give the schematic representation, graphs and equations for the same.
5. Explain in brief extra vascular compartmental modelling.
6. Explain the causes of non linearity in pharmacokinetics of drug. Add a note on estimation of  $V_{max}$  and  $K_m$ .
7. Discuss pharmacokinetic drug interaction.
8. Write a note on cytochrome P450 based drug interactions.
9. Write Michael's Menten equation. How do you estimate  $V_{max}$  and  $K_m$ .
10. Discuss about drug interactions linked to transporters.

### **UNIT IV: Drug Product Performance, In Vivo: Bioavailability and Bioequivalence**

1. Explain the protocol for bioequivalence studies.
2. Write the objectives of bioavailability studies. Enlist the methods for measurement of bioavailability. Explain method using plasma concentration data.
3. What is bioequivalence? Discuss in detail various bioequivalence study designs
4. Define bioavailability? Write a note on various method assessing bioavailability.
5. What are the objective and considerations in bioavailability studies.
6. Discuss in detail various bioequivalence study design
7. Define the terms relative and absolute bioavailability. Explain any two methods used to determine AUC.
8. Explain cross-over study design of bioavailability in detail. Give a note on measurement of bioavailability.
9. Enumerate clinical significance of bioequivalence studies.
10. Enumerate the various study designs available for carrying out bioequivalence studies and explain any one in detail





East Point Campus, Jnana Prabha, Virgo Nagar Post,  
Bengaluru – 560049, Karnataka

### **UNIT V: Application of Pharmacokinetics**

1. Discuss Pharmacokinetic drug interactions
2. Discuss pharmacokinetics and Pharmacodynamics of biotechnology drugs.
3. Write a note on application of Pharmacokinetics in targeted drug delivery systems.
4. Write a note on Pharmacokinetics and Pharmacodynamics of Protein and peptides.
5. Give a note on Pharmacokinetics and Pharmacodynamics drug interactions.
6. Describe Pharmacokinetics and Pharmacodynamics of Vaccines.
7. Compare and contrast the pharmacokinetics of conventional vs extended release dosage forms
8. Explain the Gene therapy with the help of any one FDA approved product
9. Describe the application of pharmacokinetics in the development of modified-release drug products.
10. Write a detailed note on Biosimilar and generic drug products.



East Point Campus, Jnana Prabha, Virgo Nagar Post,  
Bengaluru – 560049, Karnataka

# **Computer Aided Drug Delivery System**



East Point Campus, Jnana Prabha, Virgo Nagar Post,  
Bengaluru – 560049, Karnataka

### **UNIT I: Computers in Pharmaceutical Research and Development**

1. Outline the quality by design concept in pharmaceutical product development with respect to International conference on harmonization guidelines.
2. Describe the different levels of *In-vitro* and *In-vivo* correlation
3. Discuss the role of computers in pharmaceutical formulation.
4. Write the benefits of pharmaceutical automation in packaging.
5. Explain the computational modeling concept with respect to drug absorption and solubility.
6. Enumerate the history of computers in pharmaceutical research & development.
7. Describe the use of computers in market analysis.
8. Enumerate the history of computers in pharmaceutical research & development.
9. What are the bio waiver considerations to be considered to get the exception for *In vivo* studies?
10. Computers in Market analysis.
11. The various statistical modeling in Pharmaceutical Research and Development
12. Applications of computer aided techniques in development of Pharmaceutical emulsion.

### **UNIT II: Computational Modeling of Drug Disposition**

1. What is artificial intelligence? Mention its application.
2. Explain the computational modeling concept concerning drug absorption and solubility.
  - a. Discuss the optimization parameters and different optimization techniques in formulation development.
3. Discuss QbD.
4. Discuss ICHQ8 Guideline
5. Biomedical simulations (Pharmacokinetic & Pharmacodynamic).
  - a. Applications of scientifically based QbD.
6. The experimental design in optimization of Pharmaceutical formulations.



East Point Campus, Jnana Prabha, Virgo Nagar Post,  
Bengaluru – 560049, Karnataka

7. Comparison of the traditional and QbD approach (ICH Q8 guidelines) in Pharmaceutical development.
8. The benefits of QbD in Industry and regulation bodies.
9. Discuss in detail about ICH Q 8 guidelines.
10. What is modeling? Elaborate computational modeling of drug disposition

### **UNIT III: Computer-aided formulation development**

1. Computers in Clinical development.
2. Explain the role of computers in clinical data collection and management
3. What are the differences between non clinical, preclinical and clinical studies write short notes on clinical data collection?
4. Write the role of computers in clinical data collection and management for clinical development.
5. Write about computers in clinical development as clinical data collection and management.
6. The various statistical modeling in Pharmaceutical Research and Development

### **UNIT IV: Computer-aided biopharmaceutical characterization**

1. Explain the role of computers in clinical data collection and management.
2. What is Modeling? Explain Computational Modeling of Drug Disposition.
3. Explain in detail about computer aided formulation development.
7. The applications of computer in various Intellectual Property Rights of Pharmaceutical R & D.
8. The various statistical modeling in Pharmaceutical Research and Development.
9. The history of computers in Pharmaceutical Research and Development.
10. The experimental design in optimization of Pharmaceutical formulations.



East Point Campus, Jnana Prabha, Virgo Nagar Post,  
Bengaluru – 560049, Karnataka

**UNIT V: Artificial Intelligence (AI), Robotics and Computational fluid dynamics:**

1. Write history and role of computers in pharmaceutical research and development.
2. Write a note on Artificial intelligence and robotics in pharmaceutical automation
3. Write a note on Pharmaceutical applications, advantages and challenges of robotics in pharmaceutical product development.
4. Write a note on the Artificial intelligence and robotics in pharmaceutical automation.
5. Write a note on the Pharmaceutical applications, advantages and challenges of robotics in pharmaceutical product development.
6. Discuss about artificial intelligence and robotics in pharmaceutical automation and write their application, advantages and disadvantages.
7. Write current challenges and future directions of AI.
8. Mention and explain the various applications of Artificial intelligence in pharmaceutical automation.
9. Write brief notes about Robotics in Pharmacy

# **Cosmetics and Cosmeceuticals**

## **LONG ESSAY 7.5 MARKS**

### **UNIT I: Cosmetics-Regulatory**

1. Explain in detail plant layout and factory requirements for manufacturing of cosmetics.
2. Discuss on salient features of international nomenclature cosmetic ingredients. Add a note on the labelling requirements for cosmetic products.
3. Discuss the conditions to be fulfilled for manufacturing of cosmetics according to Indian regulatory provisions.
4. Discuss the regulatory provisions for import of cosmetics
5. Explain the regulatory requirements for labelling of cosmetics
6. Explain the conditions for obtaining license
7. Write a note on prohibition of manufacture and sale of certain cosmetics.
8. Explain about the offences and penalties of cosmetics
9. Write a note on Indian regulatory requirements for labelling of cosmetics.
10. Explain about cosmetic- regulatory aspects

### **UNIT II: Cosmetics-Biological aspects**

1. Discuss about structure of hair and hair growth cycle. List the different hair care products
2. Define cosmetic products as per European union guidelines. Discuss basic raw materials used in the formulations of creams.
3. Describe the formulations used for foot care and hygiene.
4. Discuss the cleaning and care needs of under arms. Discuss in detail about cosmeceutical products used to address body odour.
5. Define cosmetics and discuss the structure of hair and the hair growth cycle. Explain the reasons and treatment for dandruff.
6. Explain the biological aspects of skin relating problem like dry skin, acne and pigmentation
7. Write a note on common problems associated with oral cavity
8. Write a note on cleansing and care needs for face, eye lids
9. Explain about neck, body and under arm care need
10. Write a note on biological aspects of cosmetics.

### **UNIT III: Formulation Building blocks**

1. What are rheology modifiers and classify rheology modifiers.
2. Classify surfactants and mention the applications.
3. Define cosmetics. Give the building block for formulation of cream.
4. Write the classification and applications of surfactants.
5. Write a note on factors influencing effectiveness of preservatives.
6. Discuss on different controversial ingredients used in cosmetic products
7. Classify perfumes used in industry with examples.
8. Explain on the formulation of amine based hair dyes.
9. Describe the different ingredients used in the formulation of toothpaste.
10. Write the difference between perfume and flavouring agents and give the list of allergens in perfume.

### **UNIT IV: Design of cosmeceutical products**

1. Write in detail on cosmeceutical products for mouth odor and sensitive teeth.
2. Cosmeceutical products for dandruff control.
3. What are ideal properties of sun screening agents. How are they classified?
4. What is antiperspirant. Add a note on its formulation
5. Explain the skin condition relating to prickly heat and how to address the same.
6. Explain the cosmetic preparations used in treating bleeding gum and sensitive teeth.
7. Explain on the sunscreen for skin protection.
8. Classify perfumes
9. Write a note on parabens, formaldehyde liberators
10. Explain about the building blocks for formulation of a moisturizing cream, vanishing cream



## **UNIT V: Herbal cosmetics**

1. Write briefly on challenges in formulating herbal cosmetics
2. Write a note on guidelines for herbal cosmetics by private bodies.
3. Discuss about herbal ingredients used in oral care.
4. Explain hair colorants. Add brief note on herbal hair colorants.
5. What are herbal cosmetics? Discuss in detail herbal ingredients used in the formulation of cosmetics.
6. Discuss in detail various colorants. Add a note on herbal hair colorant.
7. Discuss the formulation of herbal toothpaste.
8. Discuss the role of emollients rheology modifiers in cosmetic products including their classification.
9. What are the challenges in formulating herbal cosmetics.
10. Explain the factors influencing performance of preservatives in cosmetic products.
11. Explain the role of herbal ingredients for oral care.
12. Write a note on syndet bars used in personal care.
13. Explain guidelines for herbal cosmetics with respect to preservatives.



## Vision and Mission of the Institution

### Vision

The East Point College of Pharmacy aspires to be a globally acclaimed institution, **recognized for excellence in pharmaceutical education, research and nurturing students for holistic development.**

### Mission

- M1** Create pharmacy graduates through **quality education**
- M2** Promote innovation, **creativity**, and excellence **in teaching**, learning, and **research**
- M3** **Inspire** integrity, teamwork, critical thinking, **personal** development, and ethics in **students** and lay **the** foundation for lifelong learning
- M4** **Serve** the **healthcare, technological, scientific, and economic** needs of then **society.**