

# **NOVEL DRUG DELIVERY SYSTEMS – II**

## **Polymer Science**

1. Define 'Polymer'. Describe its properties.
2. Classify polymers based on various criteria.
3. What are the ideal characteristics of biodegradable polymers? Give advantages and disadvantages of biodegradable polymer in pharmaceuticals.
4. What is smart polymer? Discuss in brief giving suitable illustration.
5. Discuss the factors affecting degradation behavior of polymers.
6. Quantity of polymer can vary 1-70%, ultimate decision is from pharmacist, Comment on regulatory aspect for this.
7. Enlist various properties of polymer. Briefly describe the importance of Molecular weight and Glass Transition temperature of polymers. Discuss about the method for determination of molecular weight of polymers
8. Discuss the role of biodegradable polymers in drug delivery system and describe the mechanism of biodegradations.
9. Discuss inactive ingredient database
10. Write a note on polymers as solubilizing agents.
11. Give biodegradation mechanism of naturally occurring polymers.
12. Discuss hydrolysable polymers
13. Discuss polymers used in colon targeted drug delivery with suitable example.
14. Describe various polymers which undergo sol-gel transition.
15. Write pharmaceutical applications of polymers and discuss in brief polymer characterization.
16. Discuss in detail polymer properties.

## **Nanotechnology**

1. Define nanotechnology and various products prepared by it. Explain application of nanoparticles and nanosuspensions giving examples for their market products.
2. Briefly introduce the term nanotechnology. Enlist the commonly used polymers into these products. Discuss any one method of preparation of nanoparticle.
3. Write about applications of nanoparticulate drug delivery system.
4. Give application of nanotechnology in the field of pharmaceutical science.
5. Explain the terms Nanotechnology and Nanoparticles. Enumerate different parameters and characterization methods for each parameter in context to characterization of Nanoparticulate system.

## **Bioadhesive systems**

1. Which are potential sites and dosage forms for bioadhesion? Draw a general schematic diagram for BDDS and classify them. Write a note on ex-vivo and in-vivo methods to study this system.
2. Discuss about theories related to Bioadhesion.
3. Discuss evaluation of bioadhesive drug delivery system.
4. Classify various factors affecting bioadhesion/mucoadhesion under separate/distinct heads and discuss in detail two factors from each head.
5. Define and explain bioadhesion, explain the theories of Bioadhesion and enumerate the properties of an ideal polymer for mucoadhesive drug delivery system

## **Insitu gels**

1. What is in-situ gel? Classify them and suggest its applications.
2. Discuss various approaches of in-situ gelation.
3. Note on: Insitu gels

## **Intelligent drug delivery systems and Tailor made medicines**

1. What do you mean by intelligent DDS, explain giving suitable illustrations?
2. What is tailor-made medicine? Explain biomarker and theranostics with reference to medicine of 2050.
3. Write about applications of hydrogel in drug delivery system.
4. Enlist various intelligent drug delivery systems. Write about the system utilizing enzymes in context to intelligent drug delivery system.
5. What is intelligent drug delivery system? Give its application
6. Write a note on tailor-made drug delivery system.
7. Discuss in detail Intelligent drug delivery

## **Strips, diskettes and film products**

1. What is diskette? Classify them and discuss in brief the methods to evaluate them.
2. Compare films/strips with TDDS; write an idea about modified TDDS.
3. Define diskettes. Write a note on buccal diskettes.

## **Liposomes and Niosomes**

1. Enlist materials used in preparation of liposomes. Discuss about lipid characterization and control of liposomes. Compare emulsion with liposome as a system
2. Describe in brief the structure of Niosomes. Write about method of preparation of Niosomes.
3. Define liposome. Give classification of liposome. Discuss about the characterization of liposomes.
4. Discuss the problems associated with liposomes drug delivery system.
5. Discuss Sonication and French Pressure Cell (with the help of diagram) in context to methods of preparation of liposomes.
6. Define Liposomes, classify them (based on structural parameters) and discuss the applications of the same.
7. Note on: Proniosomes

## **Ionto and Sonophoretic system**

1. Define sonophoresis. Differentiate between sonophoresis and iontophoresis. Discuss about drugs used by sonophoretic drug delivery system.
2. Explain electro-osmosis and electrorepulsive with reference to Iontophoresis.
3. Give advantages of using sonophoresis as a physical penetration enhancer
4. Define Iontophoresis. Discuss advantages, disadvantages, side effects and biomedical applications of the same.
5. Note on: Historical Development of Sonophoretic system.

## **Use of Spherical Techniques**

1. What is SCF? Discuss relative features of micronization by SCF technique and its application in Pharma research.
2. How does particle geometry affect Pharma processing? Discuss conventional and novel technology of spherical techniques in brief.
3. Enlist the methods of spherical crystallization. Discuss any one method of spherical crystallization and write applications of spherical crystallization.

## **Super and Sub-Critical fluids**

1. What is SCF? State the challenges of SCF. Write about applications of SCF in pharmaceutical research.
2. Give drug delivery applications of supercritical fluid technology
3. Note on: Commonly used Super Critical fluids

## **PEGylations**

1. What is PEGylation? How will you optimize manufacturing challenges and medical application of PEG-protein?
2. Briefly explain the concept of PEGylation. Give factors affecting performance of PEGlyted peptide. Discuss about manufacturing challenges.
3. Write a note on PEGylation.
4. Discuss in detail PEGylations

## **Biotech based products**

1. Write a note on  $\gamma$ -DNA technology.
2. Write a note on cell and gene therapy products.
3. Enumerate various techniques used to produce biotechnological products. Write about rDNA technology. Give examples of FDA approved rDNA products.
4. Discuss any one biotech based product in detail

## **Proteins and Peptides**

1. "Proteins and peptides are vulnerable to all sorts of problems those API can face." What are the strategies for oral delivery of protein?
2. Discuss about in-vivo and in-vitro problems associated with protein and peptide. Give your comment on formulation aspects of protein and peptide delivery system.
3. Discuss issues related to delivery of proteins and peptides.
4. Discuss challenges and stability problems in context to proteins and peptides.

## **Immunomodulated approach**

1. Write a note on Immunomodulated molecules

## **Prodrug approach**

1. Define "Pro-drug" Discuss pathways of them in therapeutics giving suitable examples.
2. Write potential of the prodrug approach
3. Discuss in detail polymer properties.