

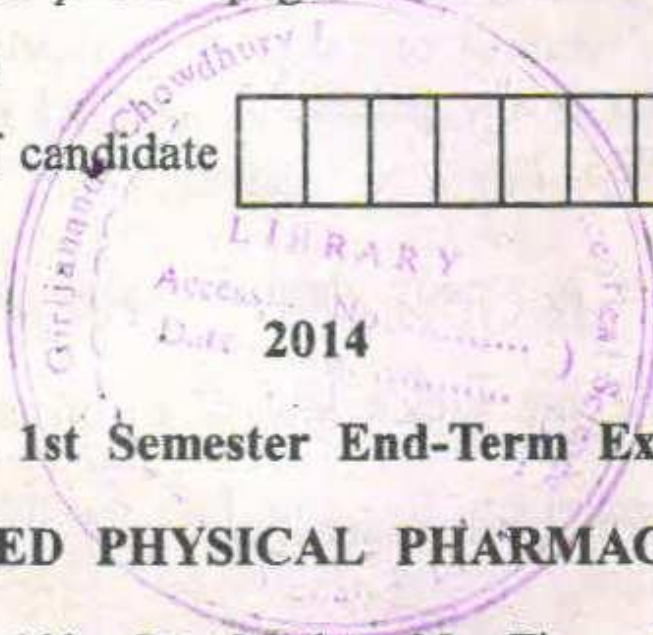
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M. Pharm 1st Semester End-Term Examination
ADVANCED PHYSICAL PHARMACEUTICS

Full Marks – 100 Pass Marks – 35 Time – Three hours

The figures in the margin indicate full marks
for the questions.

1. (a) Write two techniques to characterize drug-excipient interactions. 10×1=10
- (b) Write the biodegradable product from poly (lactide-co-glycolide) polymer.
- (c) Write the mathematical equation of Higuchi model.
- (d) How you can define the term 'NDDS' ?
- (e) Name two directly compressible tablet excipients.

[Turn over]

- (f) Define the term 'order of a reactions'.
- (g) What is the principle involved in hydrogel NDDS ?
- (h) What is steady state diffusion ?
- (i) Write the Fick's law of diffusion.
- (j) Define bioavailability.
2. (a) Derive the first order reaction rate equation for $t_{1/2}$. 10×2=20
- (b) How can you measure the flow property of powders ?
- (c) Elaborate the role of pH on drug absorption.
- (d) Compare between active and passive absorptions.
- (e) Enumerate the kinetics of drug release from polymer matrices.
- (f) How can you relate the diffusivity of a drug with its molecular size ?
- (g) Enumerate the properties of tablet influenced by compression.

- (h) Write two rate limiting steps in drug absorption. Which rate limiting step can be manipulated by the pharmacists to enhance the bioavailability of a drug (BCS II) ?
- (i) What is the prodrug of Aspirin ? Name one biodegradable hydrophilic polymer ?
- (j) Compare and contrast between 'controlled release', 'sustained release' and 'extended release' formulation of drugs.
3. (a) Enumerate the properties required to design NDDS. $3 \times 10 = 30$
- (b) Derive the equation to describe the dissolution of drug.
- (c) Give the relation between dissolution rate and absorption of drug.
- (d) How pharmaceuticals are stabilized against hydrolysis and oxidation ?
- (e) Derive the first order reaction rate equation for $t_{90\%}$ value.
- (f) Write the mechanism of solubilization.

- (g) Explain the role of micellar solubilization in enhancing solubility of poorly water soluble drugs.
- (h) Explain the application of chromatography.
- (i) Elaborate role of shape and surface area in preformulation.
- (j) Differentiate between steady state diffusion and non-steady state diffusion.
4. (a) Explain the importance of organoleptic properties and purity in designing of dosage forms. 4×5=20
- (b) Explain the application of starch polymer in pharmaceutical formulation.
- (c) How can you determine drug release mechanism from polymer matrix ?
- (d) Give the application of inclusion complexes in enhancement of solubility.
- (e) Design a protocol for accelerated stability testing of pharmaceutical formulation.

5. (a) Detail the design aspects of membrane controlled drug delivery devices with mathematical equation. $4 \times 5 = 20$
- (b) Describe the procedure used to study the dissolution of a drug from solid dosage form.
- (c) Explain the different kinetic equation and their application in pharmacy.
- (d) Explain the role of Arrhenius theory in the prediction of drug stability.