MAY 2011

[KY 343] **Sub. Code: 2904**

M.PHARM. DEGREE EXAMINATION

(Regulations 2010)

Candidates admitted from 2010-2011 onwards

FIRST YEAR

Branch I – PHARMACEUTICS

Paper IV – ADVANCES IN DRUG DELIVERY SYSTEMS

Q.P. Code : 262904

Time : Three hours **Maximum : 100 marks**

Answer All questions

I. Essay Questions: **(6 x 10 = 60)**

1. Discuss in detail about physiochemical properties of drug molecule influencing the design and performance of sustained release drug delivery system.
2. Explain with examples biodegradable and nonbiodegradable polymers used for controlled drug delivery systems.
3. Discuss the principle and procedure for *in vitro* and *in vivo* evaluation of controlled released drug delivery.
4. Give an account of approaches and applications of implantable drug delivery systems.
5. Enumerate the characteristics of drug to be formulated transdermal drug delivery systems. Discuss any two methods of formulating transdermal drug delivery systems.
6. Discuss the design and development of oral controlled release drug administration.

II. Write short notes on: **(8 x 5 = 40)**

1. Occusert.
2. Microencapsulation technique.
3. Permeation enhancers.
4. Diffusion controlled drug delivery.
5. Osmotic pressure control.
6. Granule coated products.
7. Classification of polymers.
8. Dissolution test for evaluating oral sustained release drug delivery systems.

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October 2011

[KZ 343] **Sub. Code: 2904**

M.PHARM. DEGREE EXAMINATION

FIRST YEAR

BRANCH I – PHARMACEUTICS

PAPER IV – ADVANCES IN DRUG DELIVERY SYSTEMS

Q.P. Code : 262904

Time : 3 hours **Maximum : 100 marks**
(180 Min)

Answer ALL questions in the same order.

I. Elaborate on :	**Pages (Max.)**	**Time (Max.)**	**Marks (Max.)**
1. Classify polymers and write the applications of polymers in controlled drug delivery systems. Discuss in detail about biodegradable and natural polymers.	17	40	20
2. Explain the principle and techniques of formulating nanoparticles.	17	40	20
II. Write notes on :			
1. Osmotic pressure controlled drug delivery systems.	4	10	6
2. Long acting in insulin preparations.	4	10	6
3. New trends used in ophthalmic drug delivery systems.	4	10	6
4. Resealed erythrocytes as targeted drug delivery systems.	4	10	6
5. Monoclonal antibodies.	4	10	6
6. Magnetic microspheres.	4	10	6
7. Microencapsulation by spray drying and spray congealing.	4	10	6
8. Buccal strips.	4	10	6
9. Matrix devices controlled drug delivery systems.	4	10	6
10. Factors affecting permeation of transdermal drug delivery systems.	4	10	6

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[LA 343] **MAY 2012** **Sub. Code: 2904**

M.PHARM. DEGREE EXAMINATION

FIRST YEAR

BRANCH I – PHARMACEUTICS

PAPER IV – ADVANCES IN DRUG DELIVERY SYSTEMS

Q.P. Code: 262904

Time: 3 hours **Maximum: 100 marks**

(180 Min)

Answer ALL questions in the same order.

I. Elaborate on:	**Pages (Max.)**	**Time (Max.)**	**Marks (Max.)**
1. Discuss in detail about liposomal drug delivery system in drug targeting to a specific site.	17	40	20
2. Describe mucoadhesive drug delivery systems and its various methods of preparation and evaluation.	17	40	20
II. Write notes on :			
1. Biodegradable polymers.	4	10	6
2. Subdermal implants.	4	10	6
3. Long acting penicillin preparations.	4	10	6
4. Factors influencing colon targeting drug delivery systems.	4	10	6
5. Ion exchange controlled drug delivery systems.	4	10	6
6. Prodrug.	4	10	6
7. Components in transdermal drug delivery systems.	4	10	6
8. Give a brief account on nasal absorption and various approaches for its enhancement.	4	10	6
9. Spansules.	4	10	6
10. Explain design and mechanism of occuserts.	4	10	6

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[LB 343] **NOVEMBER 2012** **Sub. Code: 2904**

M.PHARM. DEGREE EXAMS

FIRST YEAR

BRANCH I – PHARMACEUTICS

PAPER IV – ADVANCES IN DRUG DELIVERY SYSTEMS

Q.P. Code : 262904

Time : 3 hours **Maximum : 100 marks**

(180 Min)

Answer ALL questions in the same order.

I. Elaborate on :	**Pages (Max.)**	**Time (Max.)**	**Marks (Max.)**
1. What are Buccal drug delivery systems? Write a detail note on Merits, Demerits, Structure of Oral mucosa and Buccal absorption.	17	40	20
2. Discuss in detail Rate controlled drug delivery system and Explain the invitro and invivo Evaluation of Rate controlled drug delivery system.	17	40	20
II. Write Notes on :			
1. Oral controlled drug delivery system.	4	10	6
2. Applications of Polymers in Controlled drug delivery system.	4	10	6
3. Long acting contraceptive preparations.	4	10	6
4. Structure of Skin and Permeation of TDDS.	4	10	6
5. Coacervation and Phase separation technique.	4	10	6
6. Applications of Nasal drug delivery system.	4	10	6
7. Liposomes and Brain targeting.	4	10	6
8. Insitu Gels.	4	10	6
9. Ion-exchange resins.	4	10	6
10. Evaluation of TDDS.	4	10	6

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[LC 343] **APRIL 2013** **Sub. Code: 2904**

M.PHARM. DEGREE EXAMS

FIRST YEAR

BRANCH I – PHARMACEUTICS

PAPER IV – ADVANCES IN DRUG DELIVERY SYSTEMS

Q.P. Code : 262904

Time : 3 hours **Maximum : 100 marks**

I. Elaborate on : **(2x20=40)**

1. Discuss in detail Physicochemical and Biological factors influencing Design of SRDDS.
2. Discuss in detail the Formulation approaches and Evaluation of TDDS.

II. Write notes on : **(10x6=60)**

1. Classify Polymers and Write the applications of Polymers in CDDS.
2. Long acting Insulin preparations.
3. In-vitro and In-vivo Evaluation of Rate controlled drug delivery systems.
4. Write a note on Ocular inserts.
5. Resealed Erythrocytes.
6. Magnetic Microspheres.
7. Advantages and Dis-advantages of Mucoadhesive drug delivery system.
8. Add a note on Buccal drug delivery system.
9. Oral controlled release drug delivery system.
10. Microencapsulation techniques systems.

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[LD 343] **OCTOBER 2013** **Sub. Code: 2904**

M.PHARM. DEGREE EXAMINATIONS

FIRST YEAR

BRANCH I – PHARMACEUTICS

PAPER IV – ADVANCES IN DRUG DELIVERY SYSTEMS

Q.P. Code : 262904

Time: Three Hours **Maximum: 100 marks**

Answer ALL questions in the same order.

I. Elaborate on : **(2 x 20 = 40)**

1. Define targeting. Discuss in detail Liposomal Drug Delivery system.

2. Describe in detail ocular drug delivery system.

II. Write notes on : **(10 x 6 = 60)**

1. Differentiate sustained, Controlled and Conventional Drug Delivery System.
2. Co acervation phase separation.
3. Non Biodegradable polymers.
4. Long acting contraceptives
5. Various approaches for colon targeting.
6. pH controlled drug delivery system.
7. Nanoparticles.
8. Resealed erythrocytes.
9. Permeation enhancers in Transdermal Delivery.
10. Write note on Pulmonary drug delivery system.

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[LE 343] **APRIL 2014** **Sub. Code: 2904**

M.PHARM. DEGREE EXAMS
FIRST YEAR
BRANCH I – PHARMACEUTICS
PAPER IV – ADVANCES IN DRUG DELIVERY SYSTEMS

Q.P. Code : 262904

Time : 3 hours **Maximum : 100 marks**

I. Elaborate on : **(2x20=40)**

1. Explain the concepts and design of rate controlled drug delivery system.

2. Enumerate the characteristics of drug to be formulated as Transdermal Drug Delivery System. Explain formulation and evaluation in detail.

II. Write notes on : **(10x6=60)**

1. Detail the physicochemical properties of Sustained Drug Delivery Systems.
2. Give the principle of Microencapsulation. Explain any one technique adopted for bringing about Microencapsulation.
3. Give an account of Natural Polymers used in Drug Delivery System
4. Write a note on Liposomal drug delivery
5. Add a note on Magnetically responsible microspheres
6. Write a note on Long acting Pencillin preparations.
7. Explain Ocular controlled drug delivery in detail
8. Write note on Transmucosal permeability and permeation enhancers.
9. Explain briefly Pulmonary drug delivery system.
10. Describe in detail Gastro intestinal retention of oral drug delivery system.

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[LF 343] **OCTOBER 2014** **Sub. Code: 2904**

M.PHARM. DEGREE EXAMINATION
FIRST YEAR
BRANCH I – PHARMACEUTICS
PAPER IV – ADVANCES IN DRUG DELIVERY SYSTEM

Q.P. Code : 262904

Time : Three hours **Maximum : 100 marks**

I. Elaborate on: **(2 x 20 = 40)**

1. Define Mucoadhesive drug delivery systems and the various methods of preparation and evaluation.

2. Discuss the design and development of controlled release oral drug delivery system.

II. Write notes on: **(10 x 6 = 60)**

1. Physiochemical properties of drug influencing design of Sustained release preparations.
2. Biodegradable polymers
3. Implants
4. Long acting penicillin preparations
5. Evaluation of transdermal drug delivery systems
6. Opthlalmic *in situ* gels
7. Liposomes
8. Buccal strips
9. Feedback regulated drug delivery systems
10. Nanoparticles

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[LG 343] **APRIL 2015** **Sub. Code: 2904**

M.PHARM. DEGREE EXAMINATION

FIRST YEAR

BRANCH I – PHARMACEUTICS

PAPER IV – ADVANCES IN DRUG DELIVERY SYSTEMS

Q.P. Code : 262904

Time: Three Hours **Maximum: 100 marks**

Answer ALL questions

I. Elaborate on : **(2 x 20 = 40)**

1. Describe the Formulation approaches used in the development of Transdermal delivery systems. Explain the evaluation for the same.
2. What is mucoadhesive drug delivery system? Discuss the concept of Buccal delivery in detail. Write a note on pulmonary drug delivery system.

II. Write notes on : **(10 x 6 = 60)**

1. Influence of physicochemical properties of drug in the design of sustained drug delivery systems.
2. Natural polymers used in controlled drug delivery system.
3. Long acting Insulins.
4. Osmotic pressure controlled oral drug delivery system.
5. Ophthalmic inserts.
6. Vesicular carriers.
7. Magnetic microspheres.
8. Rate programmed drug delivery system.
9. Ion exchange controlled delivery system
10. Invivo evaluation of controlled release drug delivery systems.

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[LH 343] **OCTOBER 2015** **Sub. Code: 2904**

M.PHARM. DEGREE EXAMINATION
FIRST YEAR
BRANCH I – PHARMACEUTICS
PAPER IV – ADVANCES IN DRUG DELIVERY SYSTEM

Q.P. Code : 262904

Time : Three hours **Maximum : 100 marks**

I. Elaborate on: **(2 x 20 = 40)**

1. Discuss in detail the biological factors influencing the performance of sustained release drug delivery system. How route of administration have impact on the therapeutic outcomes of drug? Explain with example.

2. Explain the basic concept of target oriented drug delivery system. Write note on colon targeting.

II. Write notes on: **(10 x 6 = 60)**

1. Classification of polymers.
2. Activation modulated drug delivery system.
3. Long acting steroid preparations.
4. Factors affecting permeation and permeation enhancers in transdermal delivery system.
5. Gel diffusion controlled oral drug delivery system.
6. Buccal strips.
7. Nasal drug delivery system.
8. Insitu gels.
9. In vitro evaluation of controlled release drug delivery.
10. Implants.

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[LI 343] APRIL 2016 **Sub. Code: 2904**

M.PHARM. DEGREE EXAMINATION
FIRST YEAR
BRANCH I – PHARMACEUTICS
PAPER IV – ADVANCES IN DRUG DELIVERY SYSTEM

Q.P. Code : 262904

Time : Three hours **Maximum : 100 Marks**

I. Elaborate on: **(2 x 20 = 40)**

1. Explain the various approaches for injectable controlled release formulations. Add note on long acting Contraceptives.

2. Discuss in detail the formulation and evaluation of ocular controlled delivery system. Describe Insitu Gels.

II. Write notes on: **(10 x 6 = 60)**

1. Factors influencing the design of sustained release drug delivery system.
2. Micro encapsulation technique.
3. Polymers used in controlled drug delivery systems.
4. Activation modulated drug delivery system.
5. Evaluation of transdermal drug delivery system.
6. Dissolution controlled drug delivery system.
7. Permeation enhancers in muco adhesive delivery system.
8. Nasal absorption enhancement.
9. Resealed erythrocytes.
10. Monoclonal antibodies.

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[LJ 343] OCTOBER 2016 **Sub. Code: 2904**

M.PHARM. DEGREE EXAMINATION
FIRST YEAR
BRANCH I – PHARMACEUTICS
PAPER IV– ADVANCES IN DRUG DELIVERY SYSTEM

Q.P. Code : 262904

Time : Three hours **Maximum : 100 Marks**

I. Elaborate on: **(2 x 20 = 40)**

1. a) Write in detail Biodegradable polymers.
   b) Explain the various permeation enhancers of TDDS.

2. a) Explain briefly on loading of drugs in resealed erythrocytes.
   b) Write a note on application of nasal drug delivery system.

II. Write notes on: **(10 x 6 = 60)**

1. Discuss on production of monoclonal antibodies.
2. Write in detail advantages and disadvantages of buccal drug delivery systems.
3. What is ophthalmic inserts? Explain its evaluation parameters.
4. Explain the matrix type of controlled drug delivery with examples.
5. Briefly write on long acting penicillin preparations for parenteral controlled release system.
6. Discuss on *invitro* and *invivo* evaluation of controlled drug delivery systems.
7. Write a note on application of microencapsulation in pharmaceutical industry.
8. Explain Intrauterine SRDDS.
9. Write in detail hand shaking and non hand shaking method of preparation of liposomes.
10. Define magnetic microspheres and explain its formulation procedure.

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[LK 343] MAY 2017 **Sub. Code: 2904**

M.PHARM. DEGREE EXAMINATION
FIRST YEAR
BRANCH I – PHARMACEUTICS
PAPER IV – ADVANCES IN DRUG DELIVERY SYSTEM

Q.P. Code : 262904

Time : Three hours **Maximum : 100 Marks**

I. Elaborate on: **(2 x 20 = 40)**

1. Describe various parameters to be taken into account before selecting a drug for sustained action formulation.

2. Explain the advantages of Transdermal Drug Delivery Systems. According to the technological basis of their approach, how are these systems classified? Give an account of the marketed forms of these systems.

II. Write notes on: **(10 x 6 = 60)**

1. Coacervation Phase separation.
2. Bio degradable polymers.
3. Safety and efficacy aspects of controlled release systems.
4. Long acting insulin preparations.
5. Reservoir devices.
6. Buccal strips.
7. Trans mucosal Permeability enhancers.
8. *In situ* gels and its evaluations.
9. Nanoparticles.
10. Immunoconjugates.

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[LL 343] OCTOBER 2017 **Sub. Code: 2904**

M.PHARM. DEGREE EXAMINATION
FIRST YEAR
BRANCH I – PHARMACEUTICS
PAPER IV – ADVANCES IN DRUG DELIVERY SYSTEM

Q.P. Code : 262904

Time : Three hours **Maximum : 100 Marks**

I. Elaborate on: **(2 x 20 = 40)**

1. Explain the characteristics of an ideal polymer to be used in CDDS? Discuss biodegradable polymers commonly used in the preparations of Novel drug delivery systems.

2. What are the advantages of targeted drug delivery systems? Discuss in detail about liposomal formulations for drug targeting.

II. Write notes on: **(10 x 6 = 60)**

1. Influence of physico chemical properties in the development of sustained release dosage forms.
2. Prodrug and solubilisation approach for bio-availability enhancement.
3. Insulin pump as CDDS module.
4. Role of Ion exchange resin in SR formulations.
5. *In vitro* evaluations of transdermal drug delivery systems.
6. Buccal drug delivery system.
7. Systemic absorption of drugs through nasal route.
8. Ocular inserts and its evaluations.
9. Particulate carriers.
10. Antibody based drug delivery system.

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THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[LM 343] MAY 2018 **Sub. Code: 2904**

M.PHARM. DEGREE EXAMINATION
FIRST YEAR
BRANCH I – PHARMACEUTICS
PAPER IV – ADVANCES IN DRUG DELIVERY SYSTEM

Q.P. Code : 262904

Time : Three hours **Maximum : 100 Marks**

I. Elaborate on: **(2 x 20 = 40)**

1. What is Microencapsulation? Mention different methods of Microencapsulation. Describe any method in detail used for encapsulating a liquid drug to be converted into a free flowing solid.

2. Give a detailed account of Parenteral controlled release drug delivery systems.

II. Write notes on: **(10 x 6 = 60)**

1. Potential advantages and disadvantages of Sustained release dosage forms.
2. Chemical approach for improvement of dissolution.
3. Biodegradable polymers.
4. Properties of drug to be considered in the design of Transdermal drug delivery stystems.
5. Module for drug delivery in the GIT.
6. Muco adhesive drug delivery.
7. Design, mechanism and advantages of Ophthalmic inserts.
8. Why are liposomes considered versatile for parenteral targeted delivery?
9. Applications of resealed erythrocytes.
10. Magnetically responsive microspheres.

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THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[LN 343] OCTOBER 2018 **Sub. Code: 2904**

M.PHARM. DEGREE EXAMINATION
FIRST YEAR
BRANCH I – PHARMACEUTICS
PAPER IV – ADVANCES IN DRUG DELIVERY SYSTEM

Q.P. Code : 262904

Time : Three hours **Maximum : 100 Marks**

I. Elaborate on: **(2 x 20 = 40)**

1. Explain the classification of polymers and applications of polymers in formulation of controlled drug delivery systems.

2. Describe the design and development of dissolution, diffusion, P^H and Ion exchange controlled oral drug delivery system.

II. Write notes on: **(10 x 6 = 60)**

1. Protein binding of a drug influencing design and performance of SRDDS.
2. Activation-moduled controlled drug delivery system.
3. Long acting steroid preparation.
4. Permeation enhancers used in development of TDDS.
5. Preparation of Liposomes.
6. Advantages and disadvantages of muco adhesive drug delivery system.
7. Evaluation of ocular controlled drug delivery system.
8. Colon targeting.
9. Immunoconjugates.
10. Nanoparticles.

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THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[LP 343] OCTOBER 2019 **Sub. Code: 2904**

M.PHARM. DEGREE EXAMINATION
FIRST YEAR
BRANCH I – PHARMACEUTICS
PAPER IV – ADVANCES IN DRUG DELIVERY SYSTEM

Q.P. Code : 262904

Time : Three hours **Maximum : 100 Marks**

I. Elaborate on: **(2 x 20 = 40)**

1. What are the Basic components of TDDS and factors affecting permeation of drug through skin?

2. Explain the formulation and evaluation of ocular controlled drug delivery systems.

II. Write notes on: **(10 x 6 = 60)**

1. Biological factors influencing design and performance of SRDDS.
2. Application of polymers in formulation of controlled drug delivery system.
3. Classification of Rate programmed drug delivery system.
4. Long acting Insulin preparations.
5. Membrane and osmotic pressure controlled release oral drug delivery system.
6. Nasal drug delivery system.
7. Ophthalmic inserts and insitu gels.
8. Resealed erythrocytes.
9. Advantages and disadvantages of microencapsulation process.
10. Rationale of SRDDS.

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