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# FACULTY OF PHARMACY

**B. Pharmacy VII Semester (PCI) (Main & Backlog) Examination, February/March 2026**

**Subject: Pharmacy Practice**

**Time: 3 Hours** **Max. Marks: 75**

## PART – A

**Note: Answer all the questions.** **(10 x 2 = 20 Marks)**

1. Define clinical pharmacy.
2. Define hospital Pharmacy
3. Define ADR
4. Classify investigational new drug.
5. Mention few drugs which require TDM
6. Define drug information center
7. Mention few counselling information while dispensing antibiotics
8. Define lead time
9. Mention different methods of inventory control
10. What do you mean by fixed dose combination (FDC)

## PART – B

**Note: Answer any two questions.** **(2 x 10 = 20 Marks)**

11. List the various haematological tests and explain any five tests in detail and its significance.
12. Explain economic order quantity as a method of inventory control.
13. What are the steps involved in the patient counselling. Explain the barriers of patient counselling.

## PART – C

**Note: Answer any seven questions.** **(7 x 5 = 35 Marks)**

14. Explain organisation structure of a hospital, medical staff involved and their functions.
15. Explain various adverse drug reaction reporting and management techniques.
16. How records are maintained in wholesale and retail community pharmacy outlets
17. How drugs are dispensed to inpatients. Add a note on labelling of drugs.
18. Describe therapeutic drug monitoring.
19. What are the causes of medication non-adherence? Mention the role of pharmacist in improving adherence.
20. Explain with example how patient medication history interview is taken.
21. What is the role of pharmacist in education and training program in the hospital
22. Explain difference between prescription medicines and medication order for inpatients. What are the legal implications.

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# FACULTY OF PHARMACY

**B. Pharmacy (PCI) VII – Semester (Backlog) Examination, July 2025**

**Subject: Pharmacy Practice**

**Time: 3 Hours** **Max. Marks: 75**

## PART - A

**Note: Answer all the questions.** **(10 x 2 = 20 Marks)**

1. Discuss the functions of hospital pharmacist.
2. What is Idiosyncrasy? Give examples.
3. Mention the goals of medication history interview.
4. Enlist the types of drug distribution systems.
5. Mention the different sources of drug information.
6. Discuss the interpretation of the prescription.
7. Define Clinical Pharmacy. Mention its objectives.
8. Explain the significance of OTC drugs.
9. Define inventory. Mention the objectives of inventory control.
10. Mention the role of hospital pharmacist in the investigational use of drugs.

## PART - B

**Note: Answer any two questions.** **(2 x 10 = 20 Marks)**

11. Define Clinical Pharmacy. Explain in detail the functions and responsibilities of clinical pharmacist.
12. Define Therapeutic Drug Monitoring (TDM). Mention its objectives and explain the process involved in TDM.
13. (a) Explain in detail the objectives of Pharmacy and Therapeutic Committee (PTC).
    (b) Discuss the role of PTC in adverse drug monitoring.

## PART - C

**Note: Answer any seven questions.** **(7 x 5 = 35 Marks)**

14. Define hospital and explain its organization.
15. Explain the role and responsibilities of community pharmacist.
16. Define hospital formulary and explain its need.
17. Describe various systems involved in the dispensing of drugs to inpatients.
18. Illustrate the criteria for addition or deletion of drugs from hospital formulary.
19. Discuss the role of Pharmacist in education and training program in the hospital.
20. Discuss the role of Pharmacist in interdepartmental communication and community health education.
21. Define OTC drugs and mention their significance.
22. Mention various laboratory blood tests. Explain their significance.

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# FACULTY OF PHARMACY

**B. Pharmacy VII Semester (PCI) (Main & Backlog) Examination, March 2025**
**Subject: Pharmacy Practice**

**Time: 3 Hours** **Max. Marks: 75**

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## PART – A

**Note: Answer all the questions.** **(10 x 2 = 20 Marks)**

1. Classify Hospitals based on the system of medicine and speciality.
2. What is Idiosyncrasy? Give examples.
3. Define rational use of medicines.
4. Enlist the types of drug distribution systems.
5. Mention the different sources of drug information.
6. What do you mean by automatic stop orders?
7. Define Clinical Pharmacy. Mention its objectives.
8. Explain the significance of OTC drugs.
9. Define inventory. Mention the objectives of inventory control.
10. Define and classify ADR.

## PART – B

**Note: Answer any two questions.** **(2 x 10 = 20 Marks)**

11. Define Medication Adherence. Mention the methods to measure it. What is the role of a Pharmacist in promoting medication adherence in patients.
12. a) Explain in detail the objectives of Pharmacy and Therapeutic Committee (PTC).
    b) Discuss the role of PTC in adverse drug monitoring.
13. Define Therapeutic Drug Monitoring (TDM). Mention its objectives and explain the process involved in TDM.

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## PART – C

**Note: Answer any seven questions.** **(7 x 5 = 35 Marks)**

14. Define hospital and explain its organization.
15. Describe the various systems involved in the dispensing of drugs to inpatients.
16. Define hospital formulary and explain its need.
17. Explain the role and reponsibilites of community pharmacist.
18. Explain why communication skill is important for a pharmacist.
19. Discuss the role of Pharmacist in the education and training program in the hospital.
20. Discuss the role of Pharmacist in the interdepartmental communication and community health education.
21. Explain hospital budget preparation and implementation.
22. Mention the various laboratory blood tests. Explain their significance.

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# FACULTY OF PHARMACY

**B. Pharmacy (PCI) VII - Semester (Backlog) Examination, July 2024**
**Subject: Pharmacy Practice**

**Time: 3 Hours** **Max. Marks: 75**

## PART-A

**Note: Answer all the questions.** **(10 x 2 = 20 Marks)**

1. Define hospital. Classify it based on clinical ground.
2. Classify the community pharmacies with examples.
3. Differentiate hospital formulary and drug list.
4. Define medication adherence. Enlist the five dimensions of medication adherence.
5. Mention the specific objectives of health education.
6. Discuss the objectives of patient counseling.
7. Define Budget. Mention the approaches involved in the budget preparation.
8. Mention the steps involved in the implementation of budget plan.
9. Classify drug store based on design.
10. Explain the acquisition of premises for drug store.

## PART-B

**Note: Answer any two questions.** **(2 x 10 = 20 Marks)**

11. (a) Mention the composition and responsibilities of Pharmacy and Therapeutic Committee (PTC).
    (b) Describe the role of PTC in drug safety.

12. (a) Define adverse drug reaction. Discuss the methods of reporting the adverse drug reaction.
    (b) Explain the role of pharmacist in the management of adverse drug reaction.

13. (a) Define Therapeutic Drug Monitoring (TDM). Discuss the criteria for TDM.
    (b) Explain the factors that affect the TDM results.

## PART-C

**Note: Answer any seven questions.** **(7 x 5 = 35 Marks)**

14. Discuss in detail the functions of hospital pharmacy.
15. Describe the methods for detecting drug interactions.
16. Mention the role of Pharmacist in the medication adherence.
17. Explain the drug distribution system for in-patients in a hospital.
18. Define patient counseling. Enlist the steps involved in patient counseling.
19. Explain the types of non-verbal communication between pharmacist and patient.
20. Describe in detail the scope of clinical pharmacy.
21. Describe in brief the rational use of common over the counter medications.
22. Discuss the role of hospital pharmacist in investigational use of drugs.

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# FACULTY OF PHARMACY

**B. Pharmacy VII - Semester (PCI) (Main & Backlog) Examination, March 2024**
**Subject: Pharmacy Practice**

**Time: 3 Hours** **Max. Marks: 75**

## PART - A

**Note: Answer all the questions.** **(10 x 2 = 20 Marks)**

1. Define Hospital.
2. Define Hospital Pharmacy.
3. Define ADR.
4. Define controlled drugs.
5. Define Hospital formulary.
6. Mention few drugs which require TDM.
7. What do you mean by automatic stop order?
8. Define OTC drugs.
9. What do you mean by investigational new drug?
10. What is the significance of ESR?

## PART - B

**Note: Answer any two questions.** **(2 x 10 = 20 Marks)**

11. Define clinical pharmacy, explain the functions and responsibilities of clinical pharmacist.
12. Define inventory control? Explain in detail any one method of inventory control technique used in the procurement of drugs
13. Explain in detail therapeutic drug monitoring.

## PART - C

**Note: Answer any seven questions.** **(7 x 5 = 35 Marks)**

14. Explain functions of hospital pharmacy.
15. Describe different types of adverse drug reactions.
16. What are the legal requirement for establishing a community pharmacy?
17. Explain in detail procedure for dispensing of controlled drugs.
18. What do you mean by rational use of drugs? How the concept of Rational use can be implemented for OTC drugs
19. Explain salient features of hospital budget preparation.
20. Explain in detail various drug purchasing procedure in a hospital pharmacy
21. Explain in detail any four blood tests and their significance.
22. What do you mean by adherence? What are the methods to improve the patient adherence towards chronic therapy.

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# FACULTY OF PHARMACY

## B. Pharmacy VII Semester (PCI) (Backlog) Examination, July 2023

## Subject: Pharmacy Practice

**Time: 3 Hours** **Max. Marks: 75**

### PART - A

**Note: Answer all the questions.** **(10 x 2 = 20 Marks)**

1. Classify Hospitals based on the system of medicine and speciality.
2. Define community Pharmacy
3. Mention any two pharmacokinetic drug interactions
4. Define rational use of medicines
5. Mention few principles for the inclusion of drugs in hospital formulary
6. Define TDM.
7. Mention any two functions of DTC
8. Define DIC.
9. Mention two tertiary references used for drug information center?
10. What is the significance of C-reactive protein?

### PART - B

**Note: Answer any two questions.** **(2 x 10 = 20 Marks)**

11. Define clinical pharmacy, What are the roles and responsibilities of a clinical pharmacy department.
12. Define adherence. What are the factors affecting patient adherence. How adherence can be improved?
13. Explain in detail organisation and functions of DTC

### PART - C

**Note: Answer any seven questions.** **(7 x 5 = 35 Marks)**

14. Explain schedule N of drugs and cosmetics act 1940.
15. Describe different types of drug interactions with examples
16. What are the legal requirement for establishing a community pharmacy
17. Explain economic order quantity.
18. What are OTC drugs? How OTC drugs to be counselled?
19. Explain salient features of hospital budget preparation.
20. Explain the importance of communication skill for the pharmacist
21. Explain various urine test and its significance
22. What is patient counselling? What are the barriers of patient counselling?

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# FACULTY OF PHARMACY

B. Pharmacy VII-Semester (PCI) (Main & Backlog) Examination, March-2023

Subject: Pharmacy Practice

Time: 3 hours Max.Marks: 75

## PART-A

Note: Answer all the questions. (10x2=20marks)

1. Define and classify hospitals.
2. Define hospital pharmacy.
3. Define ADR?
4. Mention the different types of community pharmacy outlet
5. Define hospital formulary.
6. Define TDM
7. Define medication adherence.
8. What do you mean by automatic stop orders?
9. Define drug information center.
10. Give a general patient counselling information for antibiotics

## PART-B

Note: Answer any two questions (2x10=20Marks)

11. Describe organisational structure of hospital and its functions. Add a note on responsibilities of a hospital pharmacist.
12. Describe legal requirements to establish a community pharmacy outlet. What are the records to be maintained in community pharmacy outlet?
13. Explain the causes of medication adherence? What is the role of a pharmacist in promoting medication adherence in patients with chronic diseases?

## PART-C

Note: Answer any seven questions (7x5=35Marks)

14. What is the need for TDM. What are factors to be considered during TDM?
15. Explain the importance of patient history and patient medication history interview.
16. Explain the organisation and functions of pharmacy and therapeutic committee.
17. Mention the sources of drug information. Explain the advantages and disadvantages of the same.
18. Explain the role of a pharmacist in interdepartmental communication and health education in community.
19. Explain why communication skill is important for a pharmacist.
20. Explain drug related problems with examples.
21. Describe economic order quantity.
22. Explain various urine tests and their significance.

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# FACULTY OF PHARMACY

**B. Pharmacy VII-Semester (PCI) (Backlog) Examination, September 2022**

**Subject: Pharmacy Practice**

**Time: 3 hours** **Max Marks: 75**

## PART - A

**Note: Answer all the questions.** **(10 x 2 = 20 Marks)**

1. Define Primary, Secondary and Tertiary hospital.
2. Mention the functions of hospital pharmacy
3. Mention the classification of ADR
4. Define idiosyncrasy.
5. Mention few examples of pharmacokinetic drug interactions
6. Mention few drugs which require TDM
7. Define patient counselling.
8. Define lead time.
9. Define investigational drug.
10. Give a general patient counselling information for NSAIDs

## PART - B

**Note: Answer any two questions** **(2 x 10 = 20 Marks)**

11. Describe different types of drug interactions. Add a note on reporting and management of ADR
12. Describe organisation, structure, type and design of wholesale and community pharmacy outlet
13. Explain different types of drug distribution system in a hospital. What do you mean by satellite pharmacy?

## PART - C

**Note: Answer any seven questions** **(7 x 5 = 35 Marks)**

14. Define hospital formulary. What are the contents of hospital formulary? What is the difference between hospital formulary and essential drugs list?
15. Explain the role of pharmacist in improving medication adherence and highlight few counselling barriers.
16. Describe schedule N of drugs and cosmetics act rules 1945.
17. Describe the policies of pharmacy and therapeutic committee.
18. Explain the systematic approach of handling a drug information query.
19. Explain the role of a pharmacist in training and education.
20. Explain hospital budget preparation and implementation.
21. Define OTC drugs. What is the role of pharmacist in implementing rational use OTC drugs.
22. Classify investigational drugs. Explain haematological tests and its significance.

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# FACULTY OF PHARMACY

**B. Pharmacy VII - Semester (PCI) (Main & Backlog) Examination, February / March 2022**

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**Subject: Pharmacy Practice**

**Time: 3 Hours** **Max. Marks: 75**

## PART - A

**Note: Answer all questions:** **(10 x 2 = 20 Marks)**

1. What are the roles of clinical pharmacist in ward rounds?
2. Write the classification of drug related problems.
3. Mention the requisites & objectives for management of materials in hospital pharmacy.
4. Describe the significance of Drug Information Center.
5. Explain the important considerations for Therapeutic Drug Monitoring.
6. Give a brief note on the factors affecting drug variability.
7. Write a short note on material requirement for community pharmacy.
8. Give definition of drug integrations and classify them accordingly.
9. Enumerate the types of drug ADRs with examples.
10. Write a note on rational use of drugs.

## PART - B

**Note: Answer any two questions:** **(2 x 10 = 20 Marks)**

11. Define P & T Committee and write its objectives, organization and various functions.
12. Define Hospital and enumerate the organization and functions of hospital.
13. What is meant by clinical pharmacy? Explain functions and responsibility of clinical pharmacy.

## PART - C

**Note: Answer any seven questions:** **(7 x 5 = 35 Marks)**

14. Give a comprehensive note on factors affecting Therapeutic Drug Monitoring.
15. Explain the roles and responsibility of hospital pharmacist.
16. Describe the procurement or purchasing procedure for pharmaceuticals in detail.
17. Explain various hematologic tests and their significance.
18. Explain the steps involved in the preparation of hospital formulary.
19. Elaborate the requirements for establishment of Drug Information Center.
20. Provide the detailed role of pharmacist in medication adherence.
21. Write all the inclusive steps involved in patient counseling.
22. Define Inventory Control. Specify the methods of Inventory Control.

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# FACULTY OF PHARMACY

## B. Pharmacy VII-Semester (PCI) (Backlog) Examination, September 2021

## Subject: Pharmacy Practice

**Time: 2 Hours** **Max. Marks: 75**

### PART – A

**Note: Answer any seven questions.** **(7 X 3 = 21 Marks)**

1. Define Hospital. Classify it based on clinical ground.
2. What is Idiosyncrasy? Give examples.
3. Differentiate hospital formulary and drug list.
4. Enlist the types of drug distribution systems.
5. Mention the specific objectives of health education.
6. Discuss the interpretation of the prescription.
7. Define Budget. Mention the approaches involved in the budget preparation.
8. Explain the significance of OTC drugs.
9. Classify drug store based on design.
10. Mention the role of hospital pharmacist in the investigational use of drugs.

### PART – B

**Note: Answer any one questions.** **(1 X 14 = 14 Marks)**

11. Define Therapeutic Drug Monitoring (TDM). Mention its objectives and explain the process involved in TDM.
12. (a) Explain in detail the objectives of Pharmacy and Therapeutic Committee (PTC).
    (b) Discuss the role of PTC in adverse drug monitoring.
13. Define Clinical Pharmacy. Explain in detail the functions and responsibilities of clinical pharmacist.

### PART – C

**Note: Answer any five questions.** **(5 X 8 = 40 Marks)**

14. Discuss in detail the functions of hospital pharmacy.
15. Explain the role and responsibilities of community pharmacist.
16. Mention the role of Pharmacist in the medication adherence.
17. Describe the various systems involved in the dispensing of drugs to inpatients.
18. Illustrate the criteria for addition or deletion of drugs from hospital formulary.
19. Define patient counseling. Enlist the steps involved in patient counseling.
20. Discuss the role of Pharmacist in the interdepartmental communication and community health education.
21. Describe in brief the rational use of common over the counter medications.
22. Mention the various laboratory blood tests. Explain their significance.

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# FACULTY OF PHARMACY

**B. Pharmacy VII-Semester (PCI) (Main) Examination, March 2021**

**Subject: Pharmacy Practice**

**Time: 2 Hours** **Max. Marks: 75**

## PART – A

**Note: Answer any seven questions.** **(7 X 3 = 21 Marks)**

1. Describe the role of clinical pharmacist in health care setting?
2. Enumerate the types of drug related problems.
3. Mention the requisite Objectives for management of materials in hospital pharmacy.
4. Indicate the advantages and disadvantages of Unit Dose Distribution System.
5. Provide four examples of TDM drugs with their therapeutic range.
6. Give a brief note on Factors which influence drug variability?
7. Write a short note on the Material requirement for community pharmacy.
8. Define ADR and classify.
9. Explain types of drug interactions with example.
10. Write a note on rational use of drugs.

## PART – B

**Note: Answer any one question.** **(1 X 14 = 14 Marks)**

11. Define hospital formulary and elaborate the stepwise procedure involved in the preparation of hospital formulary.
12. What is clinical pharmacy? Elucidate functions and responsibility of clinical pharmacy.
13. Give a detailed account on the factors affecting Therapeutic Drug Monitoring.

## PART – C

**Note: Answer any five questions.** **(5 X 8 = 40 Marks)**

14. Explain the roles and responsibility of hospital pharmacist.
15. Write down the legal requirements for establishment and maintenance of drug store.
16. Enumerate the organization and functions of hospital.
17. Explain in detail about the role of pharmacist in medication adherence.
18. Define Pharmacy and Therapeutic Committee & explain the objectives, organization and functions.
19. Give comprehensive note on the steps involved in patient counseling.
20. Define Inventory Control. Specify the methods involved in Inventory Control.
21. Describe the procurement or purchasing procedure for pharmacists in detail.
22. Explain the various hematologic tests and their significance.

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# FACULTY OF PHARMACY

**B. Pharmacy (PCI) VII Semester (Main & Backlog) Examination, February/March 2026**

**Subject: INDUSTRIAL PHARMACY- II**

**Time: 3 Hours** **Max. Marks: 75**

## PART – A

**Note: Answer all the questions.** **(10 x 2 = 20 Marks)**

1. What is pilot plant and scale-up?
2. Mention SUPAC guidelines.
3. Define validation.
4. What is technology transfer.
5. Write the role of regulatory affairs.
6. Write the importance of ANDA.
7. What are various phases of clinical trials?
8. Write a note on informed consent.
9. Write a note on functions of CDL.
10. Write a note on COPP.

## PART B

**Note: Answer any two questions.** **(2 x 10= 20 Marks)**

11. Write the general considerations for pilot plant and scale up for various dosage forms.
12. Write in detail about **i)** IND **ii)** NDA and **iii)** ANDA
13. a) Explain the principles of QBD.
    b) Write a note on six sigma concept.

## PART C

**Note: Answer any seven questions.** **(7 x 5= 35 Marks)**

14. Write general principles of Technology Transfer.
15. Write a note on Technology Transfer related documentation.
16. Write the role of regulatory affairs department in drug approval.
17. Write about clinical research protocol.
18. Write a brief note on NABL and GLP.
19. Write a note on ISO 14000.
20. Write briefly on TQM.
21. Write a note on Indian Regulatory. Write CDSCO functions.
22. Explain about Central Drugs Laboratory and its function.

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# FACULTY OF PHARMACY

**B. Pharmacy (PCI) VII - Semester (Backlog) Examination, July 2025**

**Subject: Industrial Pharmacy - II**

**Time: 3 Hours** **Max. Marks: 75**

## PART – A

**Note: Answer all the questions.** **(10 x 2 = 20 Marks)**

1. What is OOS & change control.
2. What is platform technology.
3. What is technology transfer?
4. What are legal issues in technology transfer.
5. Define qualification and validation.
6. What is Investigator's Brochure (IB).
7. What is bioavailability and bioequivalence?
8. What is informed consent procedure for clinical trials.
9. Write the role of ISO in quality management.
10. What is COPP.

## PART – B

**Note: Answer any two questions.** **(2 x 10 = 20 Marks)**

11. Write a note on pilot plant scale up considerations for solids and semi solid dosage forms.
12. **a)** Write the principles of QBD and applications of QbD in development of pharmaceutical products.
    **b)** Write a note on Total Quality Management.
13. Write a note on the **i)** Role and responsibility of regulatory affairs professionals
    **ii)** IND and NDA application requirement for drug approval

## PART – C

**Note: Answer any seven questions.** **(7 x 5 = 35 Marks)**

14. Write a note on documentation in pilot plant and scale up.
15. Write the SUPAC guidelines for solid and liquid dosage forms.
16. Write a note on APCTD, NRDC, TIFAC technology transfer agencies in India.
17. Write a note on analytical method transfer.
18. Write a note on role of biostatistics in pharmaceutical product development and Data representation for FDA submissions.
19. Write a note on six sigma concept.
20. Write a note on ISO 14000.
21. Write a note on organization and functions of CDSCO.
22. Write a note on regulatory requirements and approval procedures for new drugs.

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# FACULTY OF PHARMACY

**B. Pharmacy (PCI) VII - Semester (Main & Backlog) Examination, March 2025**
**Subject: Industrial Pharmacy - II**

**Time: 3 Hours** **Max.Marks:75**

## PART - A

**Note: Answer all the questions.** **(10 x 2 = 20 Marks)**

1. What is scale up?
2. Write a note on documentation in pilot plant.
3. What is technology transfer?
4. Write a note on legal issues in technology transfer.
5. What is qualification and validation?
6. Write a note on Investigator's Brochure (IB).
7. What is quality assurance?
8. Why informed consent procedure is important in clinical trials?
9. Write the role of ISO in quality management.
10. Write a note on state licensing authority responsibilities.

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## PART - B

**Note: Answer any two questions.** **(2 x 10 = 20 Marks)**

11. What is pilot plant? Write the general considerations for pilot plant and scale up for Tablets and Liquid dosage forms.
12. Write a note on the (i) IND and NDA application (ii) Clinical research protocol.
13. (a) Write a note on Indian drug regulatory. Write CDSCO functions.
    (b) Explain about Central Drugs Laboratory and its function.

## PART - C

**Note: Answer any seven questions.** **(7 x 5 = 35 Marks)**

14. Write the SUPAC guidelines for solid and liquid dosage forms.
15. Write a note on documentation in pilot plant and scaleup.
16. Write general principles of technology transfer.
17. Write the role and responsibility of regulatory affairs professionals.
18. Write a note on APCTD, NRDC, TIFAC technology transfer agencies in India.
19. Write the Principles and applications of QBD.
20. Write a note on TQM.
21. Write a note on NABL and GLP.
22. Write a note on regulatory requirements and approval procedures for new drugs.

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# FACULTY OF PHARMACY

## B. Pharmacy (PCI) VII - Semester (Backlog) Examination, July 2024

## Subject: Industrial Pharmacy - II

**Time: 3 Hours** **Max.Marks:75**

### PART - A

**Note: Answer all the questions.** **(10 x 2 = 20 Marks)**

1. What is nonclinical Drug Development?
2. What is platform technology?
3. What is validation?
4. Write a note on documentation in technology transfer.
5. Write a note on Technology transfer agencies.
6. Write the role of regulatory affairs professional.
7. Write a note on ANDA application.
8. Write a note on ISO 9000.
9. Write the role of CDL.
10. Write a note on Out of specifications (OOS).

### PART - B

**Note: Answer any two questions.** **(2 x 10 = 20 Marks)**

11. What is pilot plant and scale-up? Write about pilot plant and scale up requirements for Tablets and Capsules.
12. What is technology transfer? Write general principles, procedure from R&D to production (Process, Packaging and Cleaning).
13. (a) Explain the principles of QBD and applications of QbD.
    (b) Write a note on six sigma concept.

### PART - C

**Note: Answer any seven questions.** **(7 x 5 = 35 Marks)**

14. Write the role and responsibility of regulatory affairs professionals.
15. Write the SUPAC guidelines for various dosage forms.
16. Write a note on Technology Transfer protocol.
17. Write about Investigational New Drug (IND) Application.
18. Write the role of biostatistics in pharmaceutical product development and Data representation for FDA submissions.
19. Write briefly on TQM.
20. Write a note on NABL and GLP.
21. Write a note on Indian Regulatory. Write functions of CDSCO.
22. Write a note on COPP.

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# FACULTY OF PHARMACY

**B. Pharmacy VII - Semester (PCI) (Main & Backlog) Examination, March 2024**

**Subject: Industrial Pharmacy**

**Time: 3 Hours** **Max. Marks: 75**

## PART - A

**Note: Answer all the questions.** **(10 x 2 = 20 Marks)**

1. Write a note on SUPAC guidelines.
2. What is pilot plant and scale-up?
3. Explain the importance of validation.
4. What is Technology transfer?
5. Write the role of regulatory affairs.
6. Mention five important data documents for ANDA.
7. Write a note on different stages of clinical trials.
8. What is informed consent?
9. Write a note on ISO 9000.
10. Write the role of CDL.

## PART - B

**Note: Answer any two questions.** **(2 x 10 = 20 Marks)**

11. Write about pilot plant and scale up requirements for Tablets and Capsules.
12. (a) What is technology transfer? Write general principles of Technology Transfer.
    (b) Write the role and responsibility of regulatory affairs professionals.
13. (a) Explain the principles of QBD and applications of QbD.
    (b) Write a note on NABL and GLP.

## PART - C

**Note: Answer any seven questions.** **(7 x 5 = 35 Marks)**

14. Write a note on pilot plant scale-up for liquid dosage forms.
15. Write a note on Technology Transfer procedure from R&D to production (Process, packaging and cleaning).
16. Write briefly on Investigational New Drug (IND) Application.
17. Write the role of biostatistics in pharmaceutical product development
18. What is QRM? Describe the principle and process of QRM.
19. Write a note on six sigma concept.
20. Write briefly on TQM.
21. Write a note on Indian Regulatory. Write CDSCO functions.
22. Write a note on COPP.

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# FACULTY OF PHARMACY

B. Pharmacy VII Semester (PCI) (Backlog) Examination, July 2023

Subject: Industrial Pharmacy

Time: 3 Hours

Max. Marks: 75

## PART - A

Note: Answer all the questions. (10 x 2 = 20 Marks)

1. What is technology transfer?
2. Write a note on raw materials importance in pilot plant.
3. Write a note on analytical method transfer procedure in technology transfer.
4. Write a note on legal issues in technology transfer.
5. What is Investigator's Brochure (IB)?
6. What is quality assurance?
7. Write a note on GLP.
8. Write a note on role of ISO in quality management.
9. Write a note on COPP.
10. Write a note on state licensing authority responsibilities.

## PART - B

Note: Answer any two questions. (2 x 10 = 20 Marks)

11. What is pilot plant? Write the general considerations for pilot plant and scale up for Tablets and Liquid dosage forms.

12. Write a note on the i) Principles of QBD ii) Six sigma concept.

13. (a) Write a note on Indian Regulatory. Write CDSCO functions.
    (b) Explain about Central Drugs Laboratory and its function.

## PART - C

Note: Answer any seven questions. (7 x 5 = 35 Marks)

14. Write the significance of personnel requirements and space requirements in pilot plant and scale up.
15. Write a note on documentation in pilot plant and scaleup.
16. Write general principles of technology transfer.
17. Write a note on technology transfer agencies in India.
18. Write the role and responsibility of regulatory affairs professionals.
19. Write about IND and NDA application.
20. Write the role of biostatistics in pharmaceutical product development.
21. Write the applications of QbD in formulation development.
22. Write the SUPAC guidelines for various dosageforms.

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# FACULTY OF PHARMACY

B. Pharmacy VII Semester (PCI) (Main & Backlog) Examination, March-2023

Subject: Industrial Pharmacy

Time: 3 Hours

Max. Marks: 75

## PART-A

Note: Answer all the questions. (10x2=20marks)

1. What is pilot plant and scale-up?
2. Write a note on SUPAC.
3. Define validation.
4. Name few approved regulatory bodies.
5. Write the role of regulatory affairs.
6. Write the importance of ANDA.
7. Write a note on informed consent.
8. Write a note on GLP.
9. Write a note on COPP
10. What is the role of Drug control laboratory?

## PART-B

Note: Answer any two questions (2x10=20Marks)

11. Write about pilot plant and scale up requirements for solid dosage forms.
12. a) What is technology transfer? Write general principles of Technology Transfer.
    b) Write a note on Technology Transfer agencies in India.
13. a) Explain the principles of QBD.
    b) Write a note on six sigma concept.

## PART-C

Note: Answer any seven questions (7x5=35Marks)

14. Write a note on pilot plant scale-up for semi solid dosage forms.
15. Write a note on Technology Transfer related documentation.
16. Write the role of regulatory affairs department in drug approval.
17. Write briefly on Investigational New Drug (IND) Application.
18. What is QRM? Describe the principle and process of QRM.
19. Write a note on ISO 14000.
20. Write briefly on TQM.
21. Write a note on Indian Regulatory. Write CDSCO functions.
22. Explain about Central Drugs Laboratory and its function.

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# FACULTY OF PHARMACY

**B. Pharmacy VII-Semester (PCI) (Backlog) Examination, August 2022**

**Subject: Industrial Pharmacy**

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**Time: 3 Hours** **Max. Marks: 75**

**Note: Answer all questions PART – A, any two questions from PART – B and any seven question from PART – C.**

## PART – A (10 x 2 = 20 Marks)

1 Write a note on SUPAC.
2 What is validation?
3 Write a note on DQ, IQ, OQ and PQ.
4 What is QRM?
5 Define API and excipient.
6 What are various phases of clinical trials?
7 What is the aim of NDA?
8 Define Bioavailability and Bioequivalence.
9 Write a note on CDSCO.
10 What is RDTL and its functions?

## PART – B (2 x 10 = 20 Marks)

11 (a) Write the General considerations for pilot plant and scale up.
(b) Write a note on platform technology.

12 (a) Write a note on six sigma concept.
(b) Write a note on ISO 14000.

13 (a) Discuss Regulatory requirements and approval procedures for New Drugs.
(b) Write the responsibilities of State Licensing authorities.

## PART – C (7 x 5 = 35 Marks)

14 Explain the procedure for pilot plat scale-up for semisolid dosage forms.
15 What is technology transfer? Write general principles of Technology Transfer.
16 Write the role and responsibility of regulatory affairs professionals.
17 Write a note on technology transfer agencies in India.
18 Write briefly on Investigational New Drug (IND) Application.
19 Write about QbD and its applications.
20 Write about the Certificate of Pharmaceutical Product (COPP).
21 Write a note on the principle and process of QRM.
22 Write NDA Review process.

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# FACULTY OF PHARMACY

**B. Pharmacy VII - Semester (PCI) (Main & Backlog) Examination,**
**February / March 2022**

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**Subject: Industrial Pharmacy – II**

**Time: 3 Hours** **Max. Marks: 75**

## PART - A

**Note: Answer all questions:** **(10 x 2 = 20 Marks)**

1 What is the need of pilot plant studies in pharmaceutical industries?
2 Write the level of changes expected under SUPAC.
3 Explain the quality risk management to technology transfer.
4 Describe the role of project team in the technology transfer.
5 Enlist at least four names of regulatory authorities functioning all around the world.
6 Enumerate the categories and type of INDs.
7 What are the benefits of NABL accreditation?
8 Mention the difference between corrective actions and preventive actions in quality system.
9 Write the functions of state regulatory authority.
10 What are the regulatory requirements for new drug approval?

## PART - B

**Note: Answer any two questions:** **(2 x 10 = 20 Marks)**

11 Explain the steps involved in scale-up technology.
12 Define TQM and explain its key elements.
13 Discuss IND approval process in detail with help of flow diagram.

## PART - C

**Note: Answer any seven questions:** **(7 x 5 = 35 Marks)**

14 Discuss the scale-up considerations for liquid oral pharmaceuticals.
15 Define the following: (a) Quality (b) QC (c) QA (d) Technology transfer (e) QbD
16 Discuss business process benchmarking as a tool of quality management.
17 What are the roles of regulatory affairs personnel in pharmaceutical industry?
18 Describe different models for the statistical design of clinical trials.
19 Discuss transfer of technology between R & D and manufacturing unit.
20 Differentiate between GMP and GLP.
21 Discuss importance of non-clinical drug development.
22 Describe the terms "QTPP" and "CQA" concerning QbD.

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# FACULTY OF PHARMACY

## B. Pharmacy VII-Semester (PCI) (Backlog) Examination, September 2021

## Subject: Industrial Pharmacy - II

**Time: 2 Hours** **Max. Marks: 75**

### PART – A

**Note: Answer any seven questions.** **(7 X 3 = 21 Marks)**

1. What is Pilot Plant?
2. Write a note on SUPAC.
3. What is Technology Transfer?
4. Name few approved regulatory bodies and Technology Transfer agencies in India.
5. What is the role of regulatory affairs?
6. What are various phases of clinical trials?
7. What is Quality Assurance?
8. Write a note on GLP.
9. Write a note on Indian regulatory.
10. What is the role of Drug control laboratory?

### PART – B

**Note: Answer any one questions.** **(1 X 14 = 14 Marks)**

11. What is Pilot plant and scale-up? Explain in detail about the scale up techniques for Solid dosage forms (Tablets/Capsules).
12. (a) Write a note on Indian Regulatory. Write C D S C O functions.
    (b) Write short note on State Licensing authorities.
13. (a) Write the principles of TQM.
    (b) Explain the principles of QBD.

### PART – C

**Note: Answer any five questions.** **(5 X 8 = 40 Marks)**

14. Explain the procedure for pilot plant scale-up for liquid dosage form.
15. What is technology transfer? Write general principles of Technology Transfer.
16. Write the role of regulatory affairs department in drug approval.
17. What is QRM? Describe the principle and process of QRM.
18. Write briefly on Master Formula Record and its importance.
19. Write a note on ICH guidelines.
20. Explain about Central Drugs Laboratory and its function.
21. Write brief note on (i) IND (ii) NDA.
22. Write protocol for technology transfer.

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# FACULTY OF PHARMACY

## B. Pharmacy VII-Semester (PCI) (Main) Examination, March 2021

**Subject: Industrial Pharmacy - II**

**Time: 2 Hours** **Max. Marks: 75**

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### PART – A

**Note: Answer any seven questions.** **(7 X 3 = 21 Marks)**

1. What is platform technology?
2. Define: (a) Pilot Plant (b) Scale-up.
3. 'Technology transfer means physical transfer of goods'. True or false, explain.
4. Write the roles of regulatory affairs department.
5. Explain the term "Technology transfer".
6. Differentiate between IND and NDA.
7. Write the applications of Quality by Design.
8. What is OOS? How does OOS apply only to finished products?
9. Enlist functions of regulatory authorities.
10. Write the vision and mission of CDSCO.

### PART – B

**Note: Answer any one question.** **(1 X 14 = 14 Marks)**

11. Explain the process of Change control with the help of flow-chart.
12. Discuss the NDA approval process in detail, illustrate with the help of flow diagram.
13. Explain the features of finished product technology transfer as per WHO guidelines.

### PART – C

**Note: Answer any five questions.** **(5 X 8 = 40 Marks)**

14. Discuss the stages of pharmaceutical product life-cycle.
15. Explain the principles of Good Laboratory Practice (GLP).
16. Describe in detail the barriers to technology transfer.
17. What is Investigator's Brochure (IB)? Comment on the content of IB.
18. Discuss the objectives of pilot plant.
19. Explain SUPAC guidelines.
20. Write about ISO 9000 series.
21. Describe the phases of clinical trials.
22. Enlist the key elements of TQM and explain any one of them.

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# FACULTY OF PHARMACY

**B. Pharmacy (PCI) VII – Semester (Main & Backlog) Examination, February / March 2026**

**Subject: Instrumental Methods of Analysis**

**Time: 3 Hours** **Max. Marks: 75**

## PART – A

**Note: Answer all the questions.** **(10 x 2 = 20 Marks)**

1. What are the differences between chromophore and auxochrome? Give suitable examples.
2. Explain the phenomena of fluorescence?
3. What are the sources of IR radiation?
4. Define the term Chromatography. List some chromatographic techniques.
5. List the deviations from Beer-Lambert's law.
6. What is the principle of thin layer chromatography?
7. What is the difference between nephelometry and turbidometry?
8. What are the different development techniques in paper chromatography?
9. List the similarities and differences between GC and HPLC.
10. Define electrophoresis and give examples of electrophoretic techniques.

## PART – B

**Note: Answer any two questions.** **(2 x 10 = 20 Marks)**

11. With a labelled diagram explain the principle & instrumentation of HPLC.
12. Explain the process of separation of a mixture by gel electrophoresis.
13. Explain UV-Visible instrumentation with a labeled diagram.

## PART – C

**Note: Answer any seven questions.** **(7 x 5 = 35 Marks)**

14. With a neat labelled diagram explain the principle of AAS.
15. Explain the sampling techniques in IR spectroscopy.
16. What is the principle and applications of flame photometry? Explain the instrumentation with a labelled diagram.
17. Explain in detail the experimental procedure for the separation of any mixture by TLC.
18. List and briefly explain any two GC detectors.
19. Explain the principle and methods to perform paper electrophoresis.
20. Explain the principle of Ion exchange chromatography.
21. What is meant by quenching? What are the different types of quenching?
22. Explain the principle and instrumentation of fluorimeter with a neat labeled diagram.

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# FACULTY OF PHARMACY

## B. Pharmacy (PCI) VII - Semester (Backlog) Examination, July 2025

## Subject: Instrumental Methods of Analysis

Time: 3 Hours Max.Marks:75

### PART - A

**Note: Answer all the questions.** (10 x 2 = 20 Marks)

1. Define auxochrome and chromophore with example.
2. What is fluorescence quenching? Give examples.
3. Write the interferences in Flame photometry.
4. Write the applications of Nephelometry and turbidometry techniques.
5. Mention different types of columns used in Gas chromatography?
6. Write the ion exchange mechanism of ion exchange chromatography.
7. What are the different types of molecular vibrations in IR spectroscopy?
8. Define theoretical plate and give the formula for calculating theoretical plates.
9. Define the term Electrophoretic mobility.
10. Write the applications of Gel-permeation chromatography.

### PART – B

**Note: Answer any two questions.** (2 x 10 = 20 Marks)

11. Describe different components of uv-visible spectrophotometer with a neat labelled diagram.
12. Explain the principles and experimental details of Gel electrophoresis for Quantitative analysis.
13. Explain the principles and instrumentation of Gas chromatography technique.

### PART – C

**Note: Answer any seven questions.** (7 x 5 = 35 Marks)

14. Explain the principles of fluorescence and phosphorescence with help of Jablonski diagram.
15. Explain different sample handling techniques used in IR spectroscopy.
16. Write the different factors affecting electrophoretic mobility of ions in electrophoresis separations.
17. Describe the principle instrumentation & applications of Flame Photometry?
18. Describe the TLC and applications.
19. Write about the Detectors used in HPLC.
20. Explain the separation principles and working procedure of Capillary electrophoresis.
21. Explain any two Detectors used in GC.
22. Explain the theoretical principles and applications of Paper chrometography.

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# FACULTY OF PHARMACY

**B. Pharmacy VII - Semester (PCI) (Main & Backlog) Examination, March 2025**
**Subject: Instrumental Methods of Analysis**

**Time: 3 Hours** **Max. Marks: 75**

## PART – A

**Note: Answer all the questions.** **(10 x 2 = 20 Marks)**

1. State and explain Beer-Lambert equation.
2. What are the different types of fundamental modes of vibration in molecules after absorption of IR radiations?
3. Define fluorescence and Phosphorescence phenomena.
4. Write the principles of Flame photometry technique.
5. Define the term Retention time and Resolution in HPLC?
6. Write the principles of partition and adsorption chromatography.
7. Write the applications of gel permeation chromatography.
8. What are the different types of Ion exchange resins used in Ion-exchange chromatography?
9. Write the principles of separation in Electrophoresis.
10. Write about the different types of columns used in GC.

## PART – B

**Note: Answer any two questions.** **(2 x 10 = 20 Marks)**

11. Describe different components of UV spectrophotometer with a neat labelled diagram.
12. Explain the principles and experimental details of paper chromatography for Quantitative analysis.
13. a) Describe the different sampling preparation techniques in IR spectroscopy.
    b) Describe different types of detectors used in HPLC instruments.

## PART – C

**Note: Answer any seven questions.** **(7 x 5 = 35 Marks)**

14. Discuss the different factors influencing intensity of fluorescence of molecules.
15. Explain the theoretical principles and applications of affinity chromatography.
16. Explain in brief about Paper electrophoresis technique.
17. Describe different methods for quantitative analysis of single component samples by UV spectrophotometry.
18. Explain the principle and measurement of Interferences in Atomic Absorption spectroscopy.
19. Explain the principles, advantages and disadvantages, and applications of thin layer chromatography.
20. Write about the Spectrophotometric titrations with examples?
21. Explain the different derivatization techniques used in Gas Chromatography?
22. Explain the instrumentation of Nephelotubiodmetry.

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# FACULTY OF PHARMACY

**B. Pharmacy (PCI) VII - Semester (Backlog) Examination, July 2024**

**Subject: Instrumental Methods of Analysis**

**Time: 3 Hours** **Max. Marks: 75**

## PART-A

**Note: Answer all the questions.** **(10 x 2 = 20 Marks)**

1. What are the differences between chromophore and auxochrome? Give examples.
2. List the electronic transitions.
3. What type of compounds exhibit the phenomena of fluorescence?
4. Explain the choice of filter paper in paper chromatography.
5. Explain the use and working of hollow cathode lamp
6. What is the principle of thin layer chromatography?
7. What is the difference between nephelometry and turbidometry?
8. What are the different development techniques in paper chromatography?
9. List the similarities and differences between GC and HPLC.
10. Define electrophoresis and give examples.

## PART-B

**Note: Answer any two questions.** **(2 x 10 = 20 Marks)**

11. Explain UV-Visible instrumentation with a labeled diagram.
12. Explain GC instrumentation with a labeled diagram.
13. Explain the sampling techniques in IR spectroscopy.

## PART-C

**Note: Answer any seven questions.** **(7 x 5 = 35 Marks)**

14. Explain the principle of fluorescence spectroscopy. What are the factors affecting fluorescence?
15. Explain the molecular vibrations in IR spectroscopy.
16. Explain the principle of Ion exchange chromatography
17. Explain any two detectors used in IR spectroscopy.
18. What is the principle and applications of flame photometry? Explain the instrumentation with a labelled diagram.
19. What is the principle of TLC? Explain in detail the experimental procedure for the separation of any mixture by TLC.
20. Explain the principle and methods to perform paper electrophoresis.
21. What are the factors affecting vibrations in IR spectroscopy?
22. What is meant by quenching? What are the different types of quenching?

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# FACULTY OF PHARMACY

**B. Pharmacy VII - Semester (PCI) (Main & Backlog) Examination, March 2024**
**Subject: Instrumental Methods of Analysis**

**Time: 3 Hours** **Max. Marks: 75**

## PART - A

**Note: Answer all the questions.** **(10 x 2 = 20 Marks)**

1. Explain bathochromic shift and Hypsochromic shift with examples.
2. What are chromophores and auxochromes. Give examples.
3. Write the principles of absorption in IR spectroscopy.
4. Write the principles of partition and adsorption chromatography.
5. Write the different fuel gases and oxidants used in the flame photometry technique.
6. Write the different types of stationary phases used in gel permeation chromatography separations.
7. Write the ion exchange mechanism in ion exchange chromatography.
8. Define the Capacity factor.
9. Write the effect of solvent on the absorption maximum of compounds.
10. Write the applications of affinity chromatography.

## PART - B

**Note: Answer any two questions.** **(2 x 10 = 20 Marks)**

11. Describe different components of IR spectrophotometer with a neat labelled diagram.
12. Explain the principles and experimental details of Paper chromatography.
13. Explain the principles and instrumentation of the HPLC technique.

## PART - C

**Note: Answer any seven questions.** **(7 x 5 = 35 Marks)**

14. Describe the Jablonski diagram and explain different internal and external processes in fluorescence emission.
15. Explain the factors affecting Ion exchange Chromatography and applications of the technique.
16. Explain different sample handling techniques used in IR spectroscopy.
17. Write the Instrumentation and applications of the flame photometry technique.
18. Write short notes on nepheloturbidometry.
19. Describe the different types of detectors used in UV spectrophotometers.
20. Explain the different development techniques used in paper chromatography.
21. Write the principles and applications of Atomic absorption spectroscopy.
22. Discuss the theory and principles of separation in capillary electrophoresis.

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# FACULTY OF PHARMACY

**B. Pharmacy VII Semester (PCI) (Backlog) Examination, July / August 2023**

**Subject: Instrumental Methods of Analysis**

**Time: 3 Hours** **Max. Marks: 75**

## PART - A

**Note: Answer all the questions.** **(10 x 2 = 20 Marks)**

1. Explain different types of electronic transitions.
2. What is fluorescence quenching? Give examples.
3. Write the applications of Nephelometry and turbidometry techniques.
4. What are the different types of molecular vibrations in IR spectroscopy?
5. Write the principles of separation in Electrophoresis.
6. What is chromophore and auxochrome. Give examples.
7. What are the different types of Ion exchange resins used in Ion-exchange chromatography?
8. Define theoretical plate and give the formula for calculating theoretical plates.
9. Write the principle involved in affinity chromatography.
10. State and explain Beer-Lamberts law.

## PART - B

**Note: Answer any two questions.** **(2 x 10 = 20 Marks)**

11. Describe different components of a UV-Visible spectrophotometer.
12. Explain the principles and experimental details of thin layer chromatography.
13. Explain the principles and instrumentation of Gas chromatography technique.

## PART - C

**Note: Answer any seven questions.** **(7 x 5 = 35 Marks)**

14. Explain in brief the gel electrophoresis technique.
15. Describe different methods for quantitative analysis of single component samples by UV spectrophotometry.
16. Explain the principles, advantages and disadvantages, and applications of paper chromatography.
17. Describe different types of detectors used in HPLC.
18. Write the principles and applications of atomic absorption spectroscopy.
19. Explain different sample handling techniques used in IR spectroscopy.
20. Explain the principles of fluorescence and Phosphorescence with the help of the Jablonski diagram.
21. Explain the principles and applications of partition and adsorption chromatography.
22. Write the different factors affecting electrophoretic mobility of ions in electrophoresis separartions.

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# FACULTY OF PHARMACY

B.Pharmacy VII-Semester (PCI) (Main & Backlog) Examination, March 2023

Subject: Instrumental Method of Analysis

Time: 3 Hours

Max.Marks:75

## PART - A

Note: Answer all the questions. (10 x 2 = 20 Marks)

1. Explain the principle involved in Pyroelectric detector in IR spectroscopy?
2. What are Chromophores, mention some example?
3. Define the term Quenching and their types?
4. Explain the principle involved in Bolometer Detector?
5. Define the term Electrophoretic mobility?
6. Write adsorbents used in column chromatography?
7. Mention different types of detectors used in Gas chromatography?
8. Write about the types of pumps used in HPLC?
9. Explain Spectrophotometric Titrations?
10. Derive the Beer – Lambert's law?

## PART – B

Note: Answer any two questions. (2 x 10 = 20 Marks)

11. Compare the methodology of Thin Layer and Paper Chromatography?
12. Explain in detail about the working principle and technique of Capillary Electrophoresis?
13. Explain the principle and applications of Nepheloturbidometry?

## PART – C

Note: Answer any seven questions. (7 x 5 = 35 Marks)

14. Explain the theory and procedure involved in Affinity Chromatography?
15. Write the Applications of Flame Photometry with examples?
16. Write in detail about the factors affecting Electrophoretic Mobility?
17. Describe the methodology of PartitionColumn Chromatography?
18. Write about the Interferences and their types in Atomic Absorption Spectroscopy?
19. Write a note on different sources of IR spectroscopy?
20. Describe the Factors affecting Ion Exchange Process in Ion Exchange Chromatography?
21. Write about the applications of UV with respect to single and multi-component analysis?
22. What about the stationary Phases used in Gel Chromatography?

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# FACULTY OF PHARMACY

**B. Pharmacy VII-Semester (PCI) (Backlog) Examination, August 2022**
**Subject: Instrumental Methods of Analysis**

**Time: 3 Hours** **Max. Marks: 75**

**Note: Answer all questions PART – A, any two questions from PART – B and any seven question from PART – C.**

## PART – A (10 x 2 = 20 Marks)

1. Define auxochrome and chromophore with example.
2. What is Quenching and types of quenching?
3. Write the interferences in Flame photometry and types of interference.
4. Name the Infra-Red radiation source.
5. Define the term chromatography and the general principle involved in it.
6. Mention the factors affecting Electrophoretic Mobility.
7. Write about the temperature program in Gas chromatography.
8. Explain different types of pumps used in HPLC and their brief working principle.
9. Explain the principle involved in Ion Exchange Chromatography.
10. Write the theory involved in Gel Chromatography.

## PART – B (2 x 10 = 20 Marks)

11. (a) Explain in detail about the construction and working principle of detectors used in UV-Vis spectroscopy.
    (b) Write about the Methodology involved in Paper Chromatography.
12. (a) Describe the sources and sampling techniques in IR spectroscopy.
    (b) Explain the factors affecting in exchange methodology in ion exchange chromatography.
13. (a) Explain the applications of HPLC with examples.
    (b) Write about the Instrumentation of Affinity chromatography.

## PART – C (7 x 5 = 35 Marks)

14. Explain the technique of Capillary Electrophoresis.
15. Write about electronic transitions and solvent effect on absorption spectra.
16. Describe the theory involved in fluorimetric technique.
17. Explain the instrumentation of Nephelotubiodmetry.
18. Write the factors affecting vibration in IR spectroscopy.
19. Differentiate between single and multi-component analysis in UV-Vis spectroscopy with examples.
20. Explain the principle and Interference in Atomic Absorption spectroscopy.
21. (a) Write the principle involved in column chromatography.
    (b) Explain the working principle of Thermocouple Detector.
22. Write about the Detectors used in HPLC.

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# FACULTY OF PHARMACY

**B. Pharmacy VII - Semester (PCI) (Main & Backlog) Examination, February / March 2022**

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**Subject: Instrumental Methods of Analysis**

**Time: 3 Hours** **Max. Marks: 75**

## PART - A

**Note: Answer all questions:** **(10 x 2 = 20 Marks)**

1. State and explain Beer-Lambert equation.
2. What is fluorescence quenching? Give examples.
3. Write the principles of Flame photometry technique.
4. Write the applications of Nephelometry and turbidometry techniques.
5. Write different types of stationary phase column packing materials used in HPLC.
6. Write Van Deempter equation.
7. What are the different types of Ion exchange resins used in Ion-exchange chromatography?
8. Define theoretical plate and give formula for calculating theoretical plates.
9. What is an electronic transition and types?
10. Write the principle involved in affinity chromatography.

## PART - B

**Note: Answer any two questions:** **(2 x 10 = 20 Marks)**

11. Describe different components of IR spectrophotometer.
12. Explain the principles and experimental details of paper chromatography for Quantitative analysis.
13. Explain the principles and instrumentation of Gas chromatography technique.

## PART - C

**Note: Answer any seven questions:** **(7 x 5 = 35 Marks)**

14. Explain in brief about Paper electrophoresis technique.
15. Describe different methods for quantitative analysis of single component samples by UV spectrophotometry.
16. Explain the principles, advantages and disadvantages and applications of thin layer chromatography.
17. Write about Gel Permeation chromatography.
18. Write the principles and applications of Atomic absorption spectroscopy.
19. Explain different sample handling techniques used in IR spectroscopy.
20. Explain the principles of fluorescence and Phosphorescence with help of Joblonski diagram.
21. Explain the principles and applications of partition and adsorption chromatography.
22. Write the different factors affecting electrophoretic mobility of ions in electrophoresis separations.

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# FACULTY OF PHARMACY

## B. Pharmacy VII-Semester (PCI) (Backlog) Examination, September 2021

## Subject: Instrumental Method of Analysis

**Time: 2 Hours** **Max. Marks: 75**

### PART – A

**Note: Answer any seven questions.** **(7 X 3 = 21 Marks)**

1. Explain the principle involved in Silicon photodiode detector in UV-Vis spectroscopy?
2. What are Singlet, Doublet and Triplet electronic states in Fluorimetry?
3. Define the term Retention time and Resolution in HPLC?
4. Explain the principle involved in Bolometer Detector?
5. Define the term Rf value.
6. Write the principles involved in Gel electrophoresis?
7. Mention different types of columns used in Gas chromatography?
8. Write different detectors compatible to HPLC?
9. Classify the Ion exchange chromatography?
10. Write about the deviations of Beer-Lamberts Law?

### PART – B

**Note: Answer any one questions.** **(1 X 14 = 14 Marks)**

11. (a)Explain Theory and Instrumentation of Affinity Chromatography?
    (b) Derive Beer-Lamberts Law?
12. Explain in detail the Instrumentation and Derivatization technique in Gas Chromatography?
13. (a) Write about the Spectrophotometric titrations with examples?
    (b) Explain the Internal and External conversions in fluorimetry?

### PART – C

**Note: Answer any five questions.** **(5 X 8 = 40 Marks)**

14. Write about the fundamental modes of Vibrations in polyatomic molecules?
15. Explain the Applications of Atomic Absorption spectroscopy with example?
16. Write in detail about the factors affecting Electrophoretic Mobility?
17. Describe the methodology of Adsorption Column Chromatography?
18. Write about the Interferences and their types in Flame Photometry?
19. Write a note on Wavelength selectors and sources of IR spectroscopy?
20. Describe the Principle involved in different sources of radiation of UV-Vis spectroscopy?
21. Write the methodology and application of Thin Layer Chromatography?
22. What is Quenching and explain the types of Quenching with examples?

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# FACULTY OF PHARMACY

## B. Pharmacy VII-Semester (PCI) (Main) Examination, March 2021

### Subject: Instrumental Methods of Analysis

**Time: 2 Hours** **Max. Marks: 75**

### PART – A

**Note: Answer any seven questions.** **(7 X 3 = 21 Marks)**

1. Define chromophore and Auxochrome and give examples.
2. Explain the phenomenon of Fluorescence and Phosphorescence.
3. What are the different types of fundamental modes of vibration in molecules after absorption of IR radiations?
4. Write the principles of partition and adsorption chromatography.
5. Write the different fuel gases and oxidants used in flame photometry technique.
6. Write the applications of gel permeation chromatography.
7. Write the ion exchange mechanism of ion exchange chromatogramphy.
8. Define retardation factor.
9. What is Bathochromic and Hypsochromic shift?
10. Write the principle involved in affinity chromatography.

### PART – B

**Note: Answer any one questions.** **(1 X 14 = 14 Marks)**

11. Describe different components of UV spectrophotometer with a labeled diagram.
12. Explain the principles and experimental detail of thin layer chromatography for Quantitative analysis.
13. Explain the principles and instrumentation of HPLC technique.

### PART – C

**Note: Answer any five questions.** **(5 X 8 = 40 Marks)**

14. Discuss the factors influencing intensity of fluorescence and applications of Fluorimetry technique.
15. Explain about gel electrophoresis.
16. Explain different sample handling techniques used in IR spectroscopy.
17. Write the theory and principle involved in flame photometry technique.
18. Write short notes on nepheloturbidometry.
19. Describe the different types of detectors used in Gas Chromatography.
20. Explain the different techniques used in paper chromatography.
21. Write the principles and applications of Atomic absorption spectroscopy.
22. Write the different factors affecting electrophoretic mobility of ions in electrophoresis separations.

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# FACULTY OF PHARMACY

**B. Pharmacy (PCI) VII Semester (Main & Backlog) Examination, February/March 2026**

**Subject: Novel Drug Delivery System**

**Time: 3 Hours** **Max. Marks: 75**

## PART – A

**Note: Answer all the questions.** **(10 x 2 = 20 Marks)**

1. Define controlled release dosage forms. Write its advantages.
2. What are the various ideal characters required for a drug to formulate controlled release formulations
3. Enlist the coating materials used in microencapsultion.
4. Explain mucoadhesion.
5. Define microspheres and microcapsules.
6. List out permeation enhancers used in Transdermal drug delivery system with examples.
7. Write advantages and disadvantages of implantable drug delivery systems.
8. Write the applications of targeted drug delivery system.
9. Explain the basic structural components of liposomes.
10. Explain about intra ocular barriers.

## PART B

**Note: Answer any two questions.** **(2 x 10= 20 Marks)**

11. Discuss the physicochemical factors and biological factors affecting controlled drug delivery system.
12. Explain the approaches used in development of gastro retentive drug delivery systems.
13. Explain the basic components and formulation approaches used in transdermal drug delivery system.

## PART C

**Note: Answer any seven questions.** **(7 x 5= 35 Marks)**

14. Explain the terms: Delayed release, sustained release, prolonged release and timed release. What are the formulation additives in the formulation of Delayed release formulation.
15. Define polymer. Classify them, write their applications in controlled release formulations.
16. Discuss formulation considerations of buccal drug delivery systems
17. Write a note coacervation phase separation.
18. Discuss about intra uterine devices.
19. Explain about evaluation methods of liposomes.
20. Write about production of monoclonal antibodies.
21. Explain about ocular inserts.
22. Explain about the inflatable and gastroadhesive systems.

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# FACULTY OF PHARMACY

## B. Pharmacy (PCI) VII - Semester (Backlog) Examination, July 2025

## Subject: Novel Drug Delivery Systems

Time: 3 Hours Max. Marks: 75

### PART – A

(10 x 2 = 20 Marks)

**Note: Answer all the questions.**

1. Differentiate reservior and matrix systems.
2. What are polymers. Classify them with examples.
3. Define microencapsulation. Write its applications
4. Write the advantages and disadvantages Nasal and Pulmonary routes of drug delivery.
5. Write the different types of nanoparticles.
6. What is transmucosal permeability.
7. Explain advantages and disadvantages of intrauterine devices.
8. Write the applications of monoclonal antibodies.
9. What are the advantages of niosomes when compared to liposomes
10. What is floating time and floating lag time.

### PART – B

(2 x 10 = 20 Marks)

**Note: Answer any two questions.**

11. Discuss formulation & evaluation of transdermal drug delivery systems.
12. Explain in detail coacervation phase separation method with suitable examples.
13. Discuss about in detail a) Alzet osmotic pump b) Dry powder inhaler.

### PART – C

(7 x 5 = 35 Marks)

**Note: Answer any seven questions.**

14. Explain various basic components in the formulation of Transdermal patches
15. Explain the theories of mucoadhesion.
16. Explain about factors affecting permeation in transdermal drug delivery system.
17. Discuss the approaches used in development of gastroretentive drug delivery system.
18. Explain about nasal sprays and nebulizers.
19. Write a note on evaluation of niosomes.
20. Discuss the ocusert with neat sketch.
21. Explain the preparation methods of nanoparticles.
22. Explain metered dose inhalers.

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# FACULTY OF PHARMACY

**B. Pharmacy (PCI) VII - Semester (Main & Backlog) Examination, March 2025**
**Subject: Novel Drug Delivery Systems**

**Time: 3 Hours** **Max. Marks: 75**

## PART – A

**Note: Answer all the questions.** **(10 x 2 = 20 Marks)**

1. Define the following terms?
   a) Controlled drug delivery system
   b) Sustained drug delivery system
2. Distinguish between matrix and reservoir systems?
3. List out the methods used for liposomes?
4. Define the following
   a) Osmotic drug delivery system b) Transdermal drug delivery system
5. Classify gastro retentive drug delivery systems?
6. Define the following?
   a) Implants b) Niosomes
7. Differentiate between Zero Order and First Order release kinetics?
8. List out the different types of nanoparticles?
9. Applications of monoclonal antibodies?
10. Discuss the advantages of Ocusert?

## PART – B

**Note: Answer any two questions.** **(2 x 10 = 20 Marks)**

11. Discuss the formulation and evaluation of floating drug delivery systems?
12. Write in detail about the coacervation phase separation technique?
13. Write in detail about the following?
    a) Explain about the push pull systems?
    b) Mucoadhesive drug delivery system?

## PART – C

**Note: Answer any seven questions.** **(7 x 5 = 35 Marks)**

14. Discuss about the factors influencing formulation of sustained release system?
15. Write the polymerization techniques?
16. Explain the Wuster process for microencapsulation with an example?
17. Explain the different theories of mucoadhesion?
18. Describe the formulation of Buccal drug delivery systems?
19. Discuss about the metered dose inhalers?
20. Write about ocular controlled drug delivery systems? Describe the methods to overcome the ocular barriers?
21. Write about the applications Intrauterine devices?
22. Write about the elementary osmotic pump?

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# FACULTY OF PHARMACY

## B. Pharmacy (PCI) VII - Semester (Backlog) Examination, July 2024

## Subject: Novel Drug Delivery Systems

**Time: 3 Hours** **Max. Marks: 75**

### PART - A

**Note: Answer all the questions.** **(10 x 2 = 20 Marks)**

1. Define controlled drug delivery systems and Sustained release drug delivery systems.
2. Write any three applications of polymers in formulation of controlled release drug delivery systems.
3. Explain principle of bioadhesion.
4. Define microspheres, microcapsules.
5. Explain about inflatable systems.
6. Write a note on nebulizers.
7. Differentiate liposomes and niosomes.
8. What are the advantages of nasopulmonary route of drug delivery?
9. Write the advantages and disadvantages of Intra uterine devices.
10. Write a note on Ocuserts.

### PART - B

**Note: Answer any two questions.** **(2 x 10 = 20 Marks)**

11. Discuss physicochemical and biological factors affecting controlled release formulations.
12. Explain the approaches used in development of gastro retentive drug delivery systems.
13. Discuss advantages, disadvantages and applications of Nanoparticles.

### PART - C

**Note: Answer any seven questions.** **(7 x 5 = 35 Marks)**

14. Describe controlled release formulations based on dissolution and ion exchange principles.
15. Describe coacervation phase separation technique in microencapsulation.
16. Write a note on Buccal drug delivery systems.
17. Write in detail about elementary Osmotic pump.
18. Discuss about basic components and approaches of Transdermal drug delivery system.
19. Discuss about formulation of inhalers.
20. Write a note on Liposomes.
21. Describe Monoclonal antibodies and their applications.
22. Write a note on Ocular formulations and Ocuserts.

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# FACULTY OF PHARMACY

**B. Pharmacy VII - Semester (PCI) (Main & Backlog) Examination, March 2024**

**Subject: Novel drug delivery systems**

**Time: 3 Hours** **Max. Marks: 75**

## PART - A

**Note: Answer all the questions.** **(10 x 2 = 20 Marks)**

1. Differentiate between matrix and reservoir system.
2. Define polymers. Classify them with examples.
3. Define microencapsulation. Write its applications.
4. Write the advantages and disadvantages of mucoadhesive drug delivery system.
5. Define microspheres and microcapsules.
6. Write note on permeation enhancers used in Transdermal drug delivery system with examples.
7. What is floating time and floating lag time.
8. Write the applications of targeted drug delivery system.
9. Explain the basic structural components of liposomes.
10. Explain about intra ocular barriers.

## PART - B

**Note: Answer any two questions.** **(2 x 10 = 20 Marks)**

11. Explain the approaches used in development of gastro retentive drug delivery systems.
12. Explain in detail any two methods of microencapsulation.
13. Explain the basic components and formulation approaches used in transdermal drug delivery system.

## PART - C

**Note: Answer any seven questions.** **(7 x 5 = 35 Marks)**

14. Discuss the physicochemical factors affecting controlled drug delivery system.
15. Explain the principles of mucoadhesion.
16. Write a note on nebulizers.
17. Discuss about intra uterine devices.
18. Explain about preparation methods of liposomes.
19. Write about production of monoclonal antibodies.
20. Explain about ocular inserts.
21. Explain about osmotic pump.
22. Explain about the inflatable and gastroadhesive systems.

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# FACULTY OF PHARMACY

## B. Pharmacy VII Semester (PCI) (Backlog) Examination, July-2023

**Subject: Novel drug delivery systems**

**Time: 3 Hours** **Max. Marks: 75**

### PART - A

**Note: Answer all the questions.** **(10 x 2 = 20 Marks)**

1. Define terms sustained, controlled and targeted release dosage forms.
2. List out pharmacokinetic parameters suitable for selection of drug for controlled drug delivery system.
3. Explain about inflatable systems.
4. Explain the Nasal and Pulmonary routes of drug delivery.
5. Write the advantages and disadvantages of gastroretentive drug delivery system.
6. Describe various coating materials used in microencapsulation.
7. Write note on transmucosal permeability.
8. Explain advantages and development of intrauterine devices.
9. Write the applications of monoclonal antibodies.
10. Differentiate between liposomes and niosomes

### PART - B

**Note: Answer any two questions.** **(2 x 10 = 20 Marks)**

11. Explain in detail physicochemical and biological factors affecting controlled release formulations.
12. Explain in detail coacervation phase separation method with suitable examples.
13. Discuss about in detail a) Alzet osmotic pump b) Dry powder inhaler

### PART - C

**Note: Answer any seven questions.** **(7 x 5 = 35 Marks)**

14. Discuss the classification and applications of polymers used in controlled drug delivery system.
15. Explain the theories of mucoadhesion.
16. Explain about factors affecting permeation in transdermal drug delivery system..
17. Discuss the approaches used in development of gastroretentive drug delivery system.
18. Explain about nasal sprays and nebulizers.
19. Write a note on niosomes.
20. Discuss the ocusert with neat sketch.
21. Explain the preparation methods of nanoparticles.
22. Explain metered dose inhalers.

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# FACULTY OF PHARMACY

## B. Pharmacy VII-Semester (PCI) (Main & Backlog) Examination, April-2023

### Subject: Novel Drug Delivery Systems

**Time : 3 Hours** **Max. Marks: 75**

### PART - A

**Note: Answer all questions.** **(10 x 2 = 20 Marks)**

1 Define the following dosage forms:
   (a) Controlled drug delivery systems
   (b) Sustained release drug delivery systems
2 Differentiate between matrix and reservoirs systems.
3 List out the methods used for microencapsulation technique.
4 Write the advantages of buccal drug delivery systems.
5 Types of permeation enhancers used in TDDS with examples.
6 Define the following:
   (a) Lipsomes (ii) Niosomes
7 Differentiate between Zero Order and Frist Order release kinetics.
8 List out the different types of nanoparticles.
9 Enumerate the applications of monoclonal antibodies.
10 Write the advantages of Ocuserts.

### PART - B

**Note: Answer any two questions.** **(2 x 10 = 20 Marks)**

11 Discuss the formulation of Transdermal drug delivery systems with the components and examples? Add a note on factors affecting permeation.
12 Describe in detail any two methods for preparation of microencapsulation.
13 Write in detail about the following:
   (a) Explain about the Alzet osmotic pump.
   (b) Mucoadhesive drug delivery system.

### PART - C

**Note: Answer any seven questions.** **(7 x 5 = 35 Marks)**

14 Classify the polymers with examples.
15 Discuss about the factors influencing of controlled drug delivery system.
16 Explain the different theories of mucoadhesion.
17 Write about the elementary osmotic pump.
18 Describe the formulation of floating drug delivery systems.
19 Discuss about the dry powder inhalers.
20 Write a note on intraocular barriers. Describe the methods to overcome the problem.
21 Intrauterine devices and their applications.
22 Explain the Wuster process for microencapsulation with an example.

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# FACULTY OF PHARMACY

**B. Pharmacy VII - Semester (PCI) (Backlog) Examination, September 2022**

**Subject: Novel Drug Delivery Systems**

**Time: 3 Hours** **Max. Marks: 75**

## PART – A

**Note: Answer all questions.** **(10 x 2 = 20 Marks)**

1. Define terms sustained, controlled and targeted release dosage forms.
2. Write ideal characters suitable for selection of drug for controlled drug delivery system.
3. Explain about inflatable systems.
4. Explain the Nasal and Pulmonary routes of drug delivery.
5. Write the advantages and disadvantages of gastroretentive drug delivery system.
6. Explain various coating materials used in microencapsulation.
7. Write a note on transmucosal permeability.
8. What is floating time and floating lag time.
9. Write the applications of monoclonal antibodies.
10. Compare and contrast liposomes and niosomes.

## PART – B

**Note: Answer any two questions.** **(2 x 10 = 20 Marks)**

11. Explain in detail physiochemical and biological factors affecting controlled release formulations.
12. Explain in detail coacervation phase separation method with suitable examples.
13. Discuss about advantages and disadvantages and development of intra uterine devices and applications.

## PART – C

**Note: Answer any seven questions.** **(7 x 5 = 35 Marks)**

14. Discuss the classification and applications of polymers used in controlled drug delivery system.
15. Explain the theories of mucoadhesion.
16. Explain about factors affecting permeation in transdermal drug delivery system.
17. Discuss the approaches used in development of gastroretentive drug delivery system.
18. Explain about nasal sprays and nebulizers.
19. Explain about osmotic pump.
20. Discuss the ocusert with neat sketch.
21. Explain the preparation methods of nanoparticles.
22. Explain dry powder and metered dose inhalers.

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# FACULTY OF PHARMACY

**B. Pharmacy VII-Semester (PCI) (Main & Backlog) Examination,**
**February / March 2022**

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**Subject: Novel Drug Delivery Systems**

**Time: 3 Hours** **Max. Marks: 75**

## PART - A

**Note: Answer all questions:** **(10 x 2 = 20 Marks)**

1. Define terms sustained, controlled and targeted release dosage forms.
2. Enlist ideal characters suitable for selection of drug for controlled drug delivery system.
3. Define microencapsulation, write its applications.
4. What are implantable drug delivery system with examples?
5. Write the advantages and disadvantages of mucoadhesive drug delivery system.
6. Explain various coating materials used in microencapsulation.
7. Write a note on permeation enhancers with examples.
8. What is floating time and floating lag time?
9. Write the applications of monoclonal antibodies.
10. Write the methods of evaluation of liposomes.

## PART - B

**Note: Answer any two questions:** **(2 x 10 = 20 Marks)**

11. Explain in detail physicochemical and biological factors affecting controlled release formulations.
12. Explain the methods of microencapsulation.
13. Discuss the basic components, formulation approaches for development of transdermal drug delivery system.

## PART - C

**Note: Answer any seven questions:** **(7 x 5 = 35 Marks)**

14. Discuss the classification and applications of polymers used in controlled drug delivery system.
15. Explain the theories of mucoadhesion.
16. Write a note on osmotic pump.
17. Discuss the approaches used in development of gastroretentive drug delivery system.
18. Explain about nasal sprays and nebulizers.
19. Write a note on niosomers.
20. Discuss the ocuserts with neat sketch.
21. Explain the applications of intrauterine devices.
22. Explain the formulation considerations of buccal drug delivery system.

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# FACULTY OF PHARMACY

## B. Pharmacy VII-Semester (PCI) (Backlog) Examination, September 2021

## Subject: Novel Drug Delivery Systems

**Time: 2 Hours** **Max. Marks: 75**

### PART – A

**Note: Answer any seven questions.** **(7 X 3 = 21 Marks)**

1. Define the following dosage forms?
   (a) Controlled drug delivery systems (b) Targeted drug delivery system.
2. Differentiate between matrix and reservoir systems?
3. List out the methods used for microencapsulation?
4. Define the following: (a) Implants (b) Transdermal drug delivery system.
5. Types of permeation enhancers used in TDDS with examples?
6. Define the following: (a) Liposomes (b) Niosomes
7. Differentiate between Zero Order and First Order release kinetic?
8. List out the different types of nanoparticles?
9. Enumerate the applications of monoclonal antibodies?
10. Write the advantages of Ocuserts?

### PART – B

**Note: Answer any one questions.** **(1 X 14 = 14 Marks)**

11. Discuss the formulation of Transdermal drug delivery systems with the components and examples? Add a note on factors affecting permeation?
12. Write in detail about the coacervation phase separation technique with examples?
13. Write in detail about the following:
    (a) Explain about the Alzet osmotic pump?
    (b) Mucoadhesive drug delivery system?

### PART – C

**Note: Answer any five questions.** **(5 X 8 = 40 Marks)**

14. Discuss about the factors influencing formulation of controlled drug delivery system?
15. Write the polymerization techniques?
16. Explain the Wuster process for microencapsulation with an example?
17. Explain the different theories of mucoadhesion?
18. Describe the formulation of floating drug delivery systems?
19. Discuss about the metered dose inhalers?
20. Write a note on intraocular barriers? Describe the methods to overcome the problem?
21. Write about the different types and applications of Intra-uterine devices?
22. Write about the elementary osmotic pump?

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# FACULTY OF PHARMACY

## B. Pharmacy VII-Semester (PCI) (Main) Examination, March 2021

**Subject: Novel Drug Delivery Systems**

**Time: 2 Hours** **Max. Marks: 75**

### PART – A

**Note: Answer any seven questions.** **(7 X 3 = 21 Marks)**

1. Write the advantages and disadvantages of controlled release dosage forms.
2. Explain various pharmacokinetic properties for selection of drug for controlled drug delivery system.
3. What are niosomes, write its structural components.
4. What are transdermal drug delivery system. Write its applications.
5. Write the advantages and disadvantages of mucoadhesive drug delivery system.
6. Define microspheres and microcapsules.
7. Write note on permeation enhancers with examples.
8. What is floating time and floating lag time.
9. Write the applications of targeted drug delivery system.
10. Write about classification of liposomes.

### PART – B

**Note: Answer any one question.** **(1 X 14 = 14 Marks)**

11. Explain the approaches used in development of gastro retentive drug delivery systems.
12. Explain in detail coacervation phase separation with suitable examples.
13. Discuss classification, properties and applications of polymers used in controlled drug delivery system.

### PART – C

**Note: Answer any five questions.** **(5 X 8 = 40 Marks)**

14. Discuss the physicochemical factors affecting controlled drug delivery system.
15. Explain the principles of mucoadhesion.
16. Write a note on metered dose inhaler.
17. Discuss the basis used in development of transdermal drug delivery system.
18. Explain about intra-uterine devices.
19. Write about production of monoclonal antibodies.
20. Discuss the ocular barriers, methods to overcome barriers.
21. Explain the approaches used in development of controlled drug delivery systems.
22. Explain the formulation considerations of buccal drug delivery system.

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