

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

[BPHARM 1221]

**DECEMBER 2021
(MARCH 2021 EXAM SESSION)**

Sub. Code: 2071

**B. PHARMACY DEGREE EXAMINATION
PCI Regulation SEMESTER - VII
PAPER I – INSTRUMENTAL METHODS OF ANALYSIS
Q.P. Code : 562071**

Time: Three hours

Maximum: 75 Marks

I. Elaborate on: Answer any TWO questions. (2 x 10 = 20)

1. Write the principle and instrumentation of double beam UV spectrophotometer with a neat diagram.
2. Define electrophoresis. Explain in detail about gel electrophoresis and capillary electrophoresis.
3. Write the principle and instrumentation of Gas chromatography.

II. Write notes on: Answer any SEVEN questions. (7 x 5 = 35)

1. Explain about the preparation and activation of TLC plates.
2. Describe the types of ion exchange resins used in ion exchange chromatography?
3. Explain the principle and instrumentation involved in flame emission spectroscopy.
4. Write about the different development techniques used in Paper chromatography.
5. What are the different types of vibrations in IR spectroscopy?
6. Discuss the factors affecting the fluorescence intensity.
7. Write in short about paper electrophoresis.
8. Write the principle and instrumentation of Nephelometry.
9. Write the applications of atomic absorption spectroscopy.

III. Short answers on: Answer ALL questions. (10 x 2 = 20)

1. Define Beers-Lamberts Law.
2. What is Bathochromic shift?
3. Define the term Luminescence.
4. What is R_f value? How it is determined?
5. Write any two applications of affinity chromatography.
6. What is silicagel GF?
7. Mention the light source used in Atomic Absorption Spectroscopy.
8. What is tailing and fronting peak?
9. Define Isosbestic point.
10. What is HETP?

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

[BPHARM 0522]

**MAY 2022
(SEPTEMBER 2021 EXAM SESSION)**

Sub. Code: 2071

**B. PHARMACY DEGREE EXAMINATION
PCI Regulation SEMESTER - VII
PAPER I – INSTRUMENTAL METHODS OF ANALYSIS
Q.P. Code : 562071**

Time: Three hours

Maximum: 75 Marks

I. Elaborate on: Answer any TWO questions. (2 x 10 = 20)

1. Explain the principle, and instrumentation in Gel chromatography.
2. (a) Define and derive a mathematical expression for combined Beer's–Lamberts law.
(b) Add a note on deviations from Beer's –Lamberts law.
3. Write in detail about principle, types of ion exchangers used and applications of ion exchange Chromatography.

II. Write notes on: Answer any SEVEN questions. (7 x 5 = 35)

1. Explain the principle involved in fluorimetry with Jablonski diagram.
2. Write a brief note on detecting agents used in paper chromatography.
3. Describe the working principle of hollow cathode lamp with neat diagram.
4. Write the principle and applications of Gas chromatography.
5. Explain about the different types of detection techniques in TLC.
6. Write about different system suitability parameters used in HPLC.
7. Explain the sampling techniques for solids in IR spectroscopy.
8. Write the principle and applications of nephelo-turbidimetry.
9. Explain the different types of electronic transitions involved in UV spectroscopy.

III. Short answers on: Answer ALL questions. (10 x 2 = 20)

1. Describe the terms Bathochromic shift and hypsochromic shift.
2. Define the term static quenching.
3. What is ODS?
4. What is normal phase chromatography?
5. What are auxochromes?
6. What is capacity factor?
7. Write the applications of affinity chromatography.
8. Mention the light source used in IR spectroscopy.
9. What is edge effect?
10. What is derivatisation?

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

[BPHARM 1022]

**OCTOBER 2022
(MARCH 2022 EXAM SESSION)**

Sub. Code: 2071

**B. PHARMACY DEGREE EXAMINATION
PCI Regulation SEMESTER - VII
PAPER I – INSTRUMENTAL METHODS OF ANALYSIS
Q.P. Code : 562071**

Time: Three hours

Maximum: 75 Marks

I. Elaborate on: Answer any TWO questions. (2 x 10 = 20)

1. Derive Beer-Lamberts law and explain the reasons for deviation from the law.
2. Explain the principle, instrumentation and application involved in nephlo-turbidimetry.
3. Write the principle and instrumentation of HPLC with a neat diagram.

II. Write notes on: Answer any SEVEN questions. (7 x 5 = 35)

1. What are different regions of the IR spectrum? Explain various types of stretching and bending vibrations.
2. Write note on solvent effect on Absorption spectra.
3. Give the principle and applications of Gel filtration chromatography.
4. Explain the interferences involved in Atomic absorption spectroscopy.
5. Explain Derivatization techniques in Gas Chromatography.
6. Write short notes on Ion exchanges techniques in Ion exchange chromatography.
7. Explain the principle and applications of Affinity chromatography.
8. Write a short note on Gel Electrophoresis.
9. Explain Detectors used in Gas chromatography.

III. Short answers on: Answer ALL questions. (10 x 2 = 20)

1. Define Capacity factor.
2. What is Finger print region?
3. What is phosphorescence?
4. What is Hypochromic shift?
5. List out the factors affecting quenching.
6. State Lambert's Law.
7. What are the sampling techniques used in IR spectroscopy?
8. Give the sources of radiation in UV-visible spectroscopy.
9. Give the Advantages of Photomultiplier tube.
10. What is meant by Reverse phase chromatography?

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

[B.PHARM 0323]

**MARCH 2023
(SEPTEMBER 2022 EXAM SESSION)**

Sub. Code: 2071

**B.PHARMACY DEGREE COURSE (SEMESTER EXAMINATIONS)
PCI Regulation 2017 - SEMESTER -VII
PAPER I – INSTRUMENTAL METHODS OF ANALYSIS**

Q.P. Code: 562071

Time: Three hours

Maximum: 75 Marks

I. Elaborate on: Answer any TWO questions. (2 x 10 = 20)

1. Describe the principle and instrumentation involved in Flame emission spectroscopy.
2. Explain about the theory and instrumentation of fluorimeter.
3. Discuss the different types of radiation sources used in UV and IR spectroscopy.

II. Write notes on: Answer any SEVEN questions. (7 x 5 = 35)

1. Explain the Electronic transitions involved in UV spectroscopy.
2. Write a brief note on factors effecting fluorescence.
3. What are the factors that influence vibrational frequencies? Explain.
4. Give the principle in paper chromatography. What are the detecting agents used in this technique?
5. Write the principle and Instrumentation of Capillary electrophoresis.
6. Give short notes on method of preparation and activation of TLC plates.
7. Explain the temperature programming in Gas Chromatography.
8. Write principle and Instrumentation of Ion Exchange chromatography.
9. Write a short note on partition column chromatography.

III. Short answers on: Answer ALL questions. (10 x 2 = 20)

1. What is capacity factor?
2. Name the Detectors used in Gas chromatography.
3. What is Resolution?
4. What is tailing effect?
5. What are Chromophores?
6. State Beer's Law.
7. What is finger – print region?
8. Write any two applications of HPLC.
9. Mention any two applications of Gel electrophoresis
10. What is quenching?

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

[B.PHARM 0823]

**AUGUST 2023
(MARCH 2023 EXAM SESSION)**

Sub. Code: 2071

**B. PHARMACY DEGREE EXAMINATION
PCI Regulation 2017 - SEMESTER - VII
PAPER I – INSTRUMENTAL METHODS OF ANALYSIS**

Q.P. Code: 562071

Time: Three hours

Maximum: 75 Marks

I. Elaborate on: Answer any TWO questions. (2 x 10 = 20)

1. Write the principle, preparation, procedure and method of detection in Column chromatography.
2. a) Write the sources of radiation in UV-visible spectroscopy.
b) Compare Double beam and Single beam spectrophotometer.
3. Explain the principles and applications of Atomic absorption spectroscopy.

II. Write notes on: Answer any SEVEN questions. (7 x 5 = 35)

1. What are the different detection techniques used in paper chromatography?
2. Explain the sampling techniques in IR spectroscopy.
3. List the various pumps used in HPLC. Explain in detail the working principle of any two pumps with a neat diagram.
4. a) Golay cell b) Pyroelectric detectors.
5. Write short notes on types of Columns used in Gas chromatography.
6. What are the types of ion exchange resins used in ion exchange chromatography? Explain.
7. Describe the working principle of photo multiplier tube.
8. Explain Simultaneous Equation method for multicomponent analysis.
9. Describe the construction and working of a double beam spectrofluorometer.

III. Short answers on: Answer ALL questions. (10 x 2 = 20)

1. What is HETP?
2. What are Auxochrome?
3. What are the support materials in Affinity chromatography?
4. What is self – Quenching?
5. Write any two applications of flame photometry.
6. Give the Advantages of TLC.
7. What is Isocratic elution?
8. What is bathochromic shift?
9. What is retention time?
10. What is gel electrophoresis?

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

[B.PHARM 1223]

**DECEMBER 2023
(SEPTEMBER 2023 EXAM SESSION)**

Sub. Code: 2071

**B. PHARMACY DEGREE EXAMINATION
PCI Regulation 2017 - SEMESTER - VII
PAPER I – INSTRUMENTAL METHODS OF ANALYSIS**

Q.P. Code: 562071

Time: Three hours

Maximum: 75 Marks

I. Elaborate on: Answer any TWO questions. (2 x 10 = 20)

1. With neat labeled diagram explain the working of double beam Ultra-violet-visible spectrophotometer.
2. Explain the fundamental modes of vibrations in poly atomic molecules and applications of Infra- red spectrophotometer.
3. Write in detail about the principle and instrumentation involved in Flame photometry.

II. Write notes on: Answer any SEVEN questions. (7 x 5 = 35)

1. Discuss the different factors affecting the fluorescent intensity.
2. Describe the construction and working of a hollow cathode lamp.
3. Describe with neat diagram the working principles of Nepheloturbidimeter.
4. Explain the different types of detection technique used in paper chromatography.
5. Write a note on moving boundary electrophoresis.
6. What are the detectors used in Gas chromatography? Discuss the principle of Electron Capture detector.
7. Write the theory involved in HPLC.
8. Explain the different types of ion exchange resins used in ion exchange chromatography.
9. Write a note on interferences in Flame Photometry.

III. Short answers on: Answer ALL questions. (10 x 2 = 20)

1. Define Bathochromic shift.
2. Define the term quenching.
3. Name the detectors used in Infra Red spectrometer.
4. Write two applications of TLC.
5. Write any two applications of capillary electrophoresis.
6. Name four inorganic adsorbents used in Thin Layer chromatography.
7. What are auxochromes?
8. Define Retention time.
9. What is HETP? How it is related to number of theoretical Plates and length of column?
10. What is gel chromatography?

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

[B.PHARM 0524]

MAY 2024

Sub. Code: 2071

**B. PHARMACY DEGREE EXAMINATION
PCI Regulation 2017 - SEMESTER - VII
PAPER I – INSTRUMENTAL METHODS OF ANALYSIS**

Q.P. Code: 562071

Time: Three hours

Maximum: 75 Marks

I. Elaborate on: Answer any TWO questions. (2 x 10 = 20)

1. With a neat diagram explain the principle and instrumentation of High Performance Liquid Chromatography.
2. Describe the principle and instrumentation involved in Flame emission spectroscopy.
3. Write about the theory, instrumentation and applications of Gel filtration chromatography.

II. Write notes on: Answer any SEVEN questions. (7 x 5 = 35)

1. Explain the different detectors used in Ultra-violet visible spectrophotometer.
2. Discuss the different factors affecting the fluorescent intensity.
3. What are different regions of the Infra red spectrum? Explain various types of stretching and bending vibrations.
4. Write a note on principle and applications of nepheloturbidimetry.
5. Explain the various methods of detection of compounds in Thin Layer chromatography.
6. Write short notes on Photomultiplier tube and photovoltaic cell.
7. Explain the different types of ion exchange resins and mechanism involved in ion exchange chromatography.
8. Write in short about Gel Electrophoresis.
9. Explain quenching and its types.

III. Short answers on: Answer ALL questions. (10 x 2 = 20)

1. Define Hypsochromic shift.
2. Explain self quenching.
3. State Beer – Lambert's law.
4. Mention the light source and detectors used in Atomic absorption spectroscopy.
5. Write two grades of paper used in paper chromatography.
6. Define R_f value.
7. Write any two applications of fluorimetry.
8. What are the Detectors of gas chromatography?
9. Define Resolution.
10. Why is a Guard Column used in HPLC?

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

[B.PHARM 1024]

**OCTOBER 2024
(SEPTEMBER 2024 EXAM SESSION)**

Sub. Code: 2071

**B. PHARMACY DEGREE (SEMESTER EXAMINATIONS)
PCI Regulation 2017 - SEMESTER - VII
PAPER I – INSTRUMENTAL METHODS OF ANALYSIS**

Q.P. Code: 562071

Time: Three hours

Maximum: 75 Marks

I. Elaborate on: Answer any TWO questions. (2 x 10 = 20)

1. Write the principle and instrumentation of double beam UV spectrophotometer with a neat diagram.
2. Write in detail about principle, types of ion exchangers used and applications of ion exchange Chromatography.
3. Explain the principle, instrumentation and application involved in Nepheloturbidimetry.

II. Write notes on: Answer any SEVEN questions. (7 x 5 = 35)

1. What are different regions of the IR spectrum? Explain various types of stretching and bending vibrations.
2. Give the principle and applications of Gel Filtration Chromatography.
3. Write a brief note on factors effecting Fluorescence.
4. Give short notes on method of preparation and activation of TLC plates.
5. What are the different detection techniques used in paper Chromatography?
6. Explain Simultaneous Equation method for multicomponent analysis.
7. Describe the construction and working of a hollow cathode lamp.
8. Write the principle and Instrumentation of Capillary electrophoresis.
9. Write a note on interferences in Flame Photometry.

III. Short answers on: Answer ALL questions. (10 x 2 = 20)

1. What is Bathochromic shift?
2. What is HETP?
3. What is Edge effect?
4. Write the applications of Affinity Chromatography.
5. List out the factors affecting quenching.
6. Write any two applications of HPLC.
7. What are Chromophores?
8. What is Isocratic elution?
9. Write any two applications of flame photometry.
10. What is finger – print region?

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

[B.PHARM 0325]

MARCH 2025

Sub. Code: 2071

B. PHARMACY DEGREE (SEMESTER EXAMINATIONS)

PCI Regulation 2017 - SEMESTER - VII

PAPER I – INSTRUMENTAL METHODS OF ANALYSIS

Q.P. Code: 562071

Time: Three hours

Maximum: 75 Marks

I. Elaborate on: Answer any TWO questions.

(2 x 10 = 20)

1. Explain the principle, instrumentation and applications of nepheloturbidimetry.
2. Write the principle and instrumentation in Gel Chromatography.
3. Define R_f value. Explain the principle, methodology, advantages and disadvantages of Thin layer chromatography.

II. Write notes on: Answer any SEVEN questions.

(7 x 5 = 35)

1. What are different types of vibrations in Infrared Spectroscopy?
2. State and derive Beer-Lambert's Law.
3. Write a short note on paper electrophoresis.
4. Explain the detectors used in Gas Chromatography.
5. Write the applications of atomic absorption spectroscopy.
6. Explain the principle and applications of Affinity chromatography.
7. Name the various pumps used in High Performance Liquid Chromatography.
Write in detail about the working principle of any two pumps with a neat diagram.
8. Describe the different types of ion exchange resins used in ion exchange chromatography.
9. Explain the working principle of photomultiplier tube and photovoltaic cell.

III. Short answers on: Answer ALL questions.

(10 x 2 = 20)

1. Define static quenching.
2. Explain the term Bathochromic shift.
3. What is capacity factor?
4. What is finger print region?
5. What is Phosphorescence?
6. What is Resolution?
7. Write any two applications of High-Performance Liquid Chromatography.
8. What are the support materials used in Affinity chromatography?
9. Mention the sampling techniques used in Infrared spectroscopy.
10. What is Silica GF?

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

[B.PHARM 0925]

SEPTEMBER 2025

Sub. Code: 2071

B. PHARMACY DEGREE (SEMESTER EXAMINATIONS)

PCI Regulation 2017 - SEMESTER - VII

PAPER I – INSTRUMENTAL METHODS OF ANALYSIS

Q.P. Code: 562071

Time: Three hours

Maximum: 75 Marks

I. Elaborate on: Answer any TWO questions.

(2 x 10 = 20)

1. a) Define and derive a mathematical expression for Beer's-Lamberts law.
b) Add a note on deviations from Beer's law.
2. Write the principle and instrumentation of HPLC with a neat diagram.
3. Describe the principle and instrumentation involved in Flame emission spectroscopy.

II. Write notes on: Answer any SEVEN questions.

(7 x 5 = 35)

1. Give the principle in paper chromatography. What are the detecting agents used in this technique.
2. What are the different types of vibrations in IR spectroscopy?
3. Write the principle and instrumentation of Nephelometry.
4. Explain the principle and applications of Affinity chromatography.
5. Write a short note on Gel Electrophoresis.
6. Explain Detectors used in Gas chromatography.
7. Explain about the different types of detection techniques in TLC.
8. Explain the interferences involved in Atomic absorption spectroscopy.
9. Write a short note on partition column chromatography.

III. Short answers on: Answer ALL questions.

(10 x 2 = 20)

1. Define the term Luminescence.
2. Define Isosbestic point.
3. What is R_f value? How it is determined?
4. Define the term static quenching.
5. What are auxochromes?
6. Define Capacity factor.
7. What is tailing effect?
8. What is phosphorescence?
9. Give the sources of radiation in UV-visible spectroscopy.
10. What is normal phase chromatography?
