

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

[LL 941]

NOVEMBER 2017

Sub. Code: 2941

M.PHARM. DEGREE EXAMINATION
(PCI New regulations 2016)
SEMESTER-I
PHARMACEUTICAL CHEMISTRY – MPC
PAPER I – MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES

Q.P. Code : 262941

Time : Three hours

Maximum : 75 Marks

I. Elaborate on:

(2 x 20 = 40)

1. a) Explain in detail the theory and instrumentation of NMR spectrometer.
b) Classify chromatographic methods based on mechanism of separation and add a note on column chromatography.
2. a) Explain the theory of Mass spectroscopy and add a note on matrix assisted laser desorption ionization mass spectroscopy.
b) Discuss a detail account on factors affecting vibrational frequencies and calculate the vibrational degrees of freedom for benzene and carbon dioxide molecule.

II. Write notes on:

(7 x 5 = 35)

1. Write a note on X- ray powder diffraction technique.
2. Give an account on principle and methodology of thermogravimetric analysis.
3. Describe stationary phases used in HPLC and GLC.
4. Explain the principle of electrophoresis and factors affecting separation.
5. Briefly explain the principle and working of potentiometer.
6. Discuss on quenching and factors affecting fluorescence intensity.
7. Write the comparison of flame emission and atomic absorption spectroscopy.

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[LM 941]

MAY 2018

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M.PHARM. DEGREE EXAMINATION
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SEMESTER-I
PHARMACEUTICAL CHEMISTRY – MPC
PAPER I – MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES

Q.P. Code : 262941

Time : Three hours

Maximum : 75 Marks

I. Elaborate on:

(2 x 20 = 40)

1. a) Explain the various components and working principle of fluorescence Spectrophotometer.
b) Give a detailed account on Ion selective electrodes.
2. a) State the important laws governing UV absorption and derive the mathematical expression for the combined laws.
b) Explain the principle and Instrumentation of Heat flux DSC.
c) How many NMR signals are expected in each of the following compounds?
i) 2- butanone ii) α -bromopropanoic acid

II. Write notes on:

(7 x 5 = 35)

1. Explain the theory and modes of molecular vibrations in IR spectroscopy.
2. Discuss about spin-spin coupling and coupling constant.
3. Briefly explain on affinity chromatography.
4. Describe the working of flame ionization detector and thermal conductivity detector.
5. Give a detail account on Fast Atom Bombardment.
6. Explain on capillary zone electrophoresis.
7. Calculate the concentration in mcg/ml of a solution of tryptophan (molecular weight 204.2) in 0.1M Hydrochloric acid, giving an absorbance at its wavelength maxima, 277nm, of 0.613 in a 4 cm cell. The molecular absorptivity at 277 nm is 5432.

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[LO 941]

MAY 2019

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SEMESTER-I
PHARMACEUTICAL CHEMISTRY – MPC
PAPER I – MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES

Q.P. Code : 262941

Time : Three hours

Maximum : 75 Marks

I. Elaborate on:

(2 x 20 = 40)

1. a) Instrumentation and application of Dispersive and Fourier IR Spectrophotometer.
b) Write a note on the theory and working of Zone electrophoresis.
c) What do you mean by Quadrapole analyzers of Mass spectroscopy?
2. a) Principle, instrumentation and application of NMR spectroscopy.
b) Discuss the IR interpretation.
 - i) Benzaldehyde ii) Acetaldehyde iii) $C_6H_5 - CH = CH_2$
 - iv) P-Chloro phenol.

II. Write notes on:

(7 x 5 = 35)

1. Describe the construction and working principle of photomultiplier tube and Argon ionization detector.
2. Write short notes on Affinity and Gel Chromatography.
3. Theory and applications of HPTLC.
4. Discuss about the importance of MALDI and ESI.
5. Detail about the principle and instrumentation of HPLC.
6. Statement, derivation and limitations of Beer Lambert's law.
7. Moving boundary electrophoresis – principle and application.

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[LP 941]

NOVEMBER 2019

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M.PHARM. DEGREE EXAMINATION
(PCI New regulations 2016)
SEMESTER-I
BRANCH II – PHARMACEUTICAL CHEMISTRY – MPC
PAPER I – MODERN PHARMACEUTICAL ANALYTICAL
TECHNIQUES

Q.P. Code : 262941

Time : Three hours

Maximum : 75 Marks

I. Elaborate on:

(2 x 20 = 40)

1. a) With the help of a neat sketch explain the various components and working principle of Mass Spectrometer.
b) Give a detail note on deuterium exchange reactions and Nuclear Overhauser Effect.
2. a) Explain the principle and instrumentation of Gas Chromatography.
b) Describe the various detectors used in UV-Visible spectrophotometer.

II. Write notes on:

(7 x 5 = 35)

1. Give the construction, principle and operation of Total consumption burner and Hollow Cathode Lamp.
2. Explain the steps involved in the analysis of drugs using HPTLC.
3. How can you distinguish between two isomers of molecular formula, C_3H_6O using IR Spectroscopy?
4. Define electrophoresis, classify with examples and add a note on gel electrophoresis.
5. Briefly explain on origin and production of X- rays.
6. Explain the principle and application of potentiometric titrations.
7. Give an account on TG curve and its applications.

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

[LQ 0121]

JANUARY 2021

Sub. Code: 2941

(APRIL 2020 EXAM SESSION)

M.PHARMACY DEGREE EXAMINATION

SEMESTER-I (PCI New regulations 2016)

PHARMACEUTICAL CHEMISTRY – MPC

PAPER I – MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES

Q.P. Code : 262941

Time : Three hours

Answer ALL Questions

Maximum : 75 Marks

I. Elaborate on:

(2 x 20 = 40)

1. a) Explain with illustrations the working principle, instrumentation and applications of UV single beam spectrophotometer.
b) Enumerate any two factors influencing the followings:
 - i) Vibrational frequencies
 - ii) Fluorescence
 - iii) Band broadening in Chromatographic column
 - iv) Resolution and
 - v) Source of errors in Potentiometry.
2. a) Give the IR interpretation of following.
 - i) $C_6H_5CH = CH - CHO$ (Cinnamaldehyde)
 - ii) $CH_3 - \overset{O}{\parallel} - C_6H_5$ (Acetophenone)b) Discuss the 1H NMR signals of
 - i) Ethanol (CH_3CH_2OH)
 - ii) Phenol (C_6H_5OH)

II. Write notes on:

(7 x 5 = 35)

1. Principle, experimental parameters and applications of Differential thermal analysis.
2. Discuss about the detectors and sampling techniques in IR spectroscopy.
3. Write a brief account on the theory and applications of :
 - a) Capillary electrophoresis and
 - b) X-ray crystallography.
4. Compare and contrast of the followings:
 - a) Normal and reverse phase chromatography
 - b) Gradient and isocratic elution
5. Explain the production of X- rays and Bragg's Law.
6. Outline the salient features of NMR spectroscopy which are used in structural elucidation.
7. Give an account on Derivative spectroscopy.

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[MPHARM 0921]

**SEPTEMBER 2021
(OCTOBER 2020 EXAM SESSION)**

Sub. Code: 2941

**M.PHARMACY DEGREE EXAMINATION
SEMESTER-I (PCI New regulations 2016)
PHARMACEUTICAL CHEMISTRY - MPC
PAPER I – MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES
*Q.P. Code : 262941***

Time : Three hours

Answer ALL Questions

Maximum : 75 Marks

I. Elaborate on:

(2 x 20 = 40)

1. a) Principle, instrumentation and factors affecting results of thermal gravimetry analysis.
b) Principle and application of Carbon-13 nuclear magnetic resonance spectroscopy.
2. a) Theory and sample handling in Infrared spectroscopy.
b) Write a interpretation of Infrared spectrum of the following compounds
 - i) 1-Hexane
 - ii) 1- butanol

II. Write notes on:

(7 x 5 = 35)

1. Instrumentation and application of spectrofluorimetry.
2. Quantum Numbers and their role in Nuclear Magnetic Resonance spectroscopy.
3. Matrix Assisted Lasser Desorption Ionization (MALDI).
4. Write a note on ultra high performance liquid chromatography.
5. Boundary electrophoresis and isoelectric focusing.
6. Thermal transition in modulated Differential scanning calorimetry.
7. Solvent and solvent effect in ultraviolet spectroscopy.

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

[MPHARM 0422]

APRIL 2022
(OCTOBER 2021 EXAM SESSION)

Sub. Code: 2941

M.PHARMACY DEGREE EXAMINATION
SEMESTER-I (PCI New regulations 2016)
PHARMACEUTICAL CHEMISTRY - MPC
PAPER I – MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES
Q.P. Code : 262941

Time : Three hours

Answer ALL Questions

Maximum : 75 Marks

I. Elaborate on:

(2 x 20 = 40)

1. a) Principle, instrumentation and factors affecting results of thermal gravimetry analysis.
b) Principle and application of Carbon-13 nuclear magnetic resonance spectroscopy.
2. a) Theory and sample handling in Infrared spectroscopy.
b) Write a interpretation of Infrared spectrum of the following compounds
 - i) 1-Hexane
 - ii) 1- butanol

II. Write notes on:

(7 x 5 = 35)

1. Instrumentation and application of spectrofluorimetry.
2. Quantum Numbers and their role in Nuclear Magnetic Resonance spectroscopy.
3. Matrix Assisted Laser Desorption Ionization (MALDI).
4. Note on ultra high performance liquid chromatography.
5. Boundary electrophoresis and isoelectric focusing.
6. Thermal transition in modulated Differential scanning calorimetry.
7. Solvent and solvent effect in ultraviolet spectroscopy.

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[M.PHARM 0922]

SEPTEMBER 2022
(APRIL 2022 EXAM SESSION)

Sub. Code: 2941

M.PHARMACY DEGREE EXAMINATION
SEMESTER - I (PCI New regulations 2016)
PHARMACEUTICAL CHEMISTRY - MPC
PAPER I – MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES

Q.P. Code : 262941

Time : Three hours

Answer ALL Questions

Maximum : 75 Marks

I. Elaborate on:

(2 x 20 = 40)

1. a) Explain the general Mass fragmentation and its rule for important organic compounds.
b) Discuss in detail about GC-Derivatization.
2. a) Discuss ^1H NMR signals of the following.
i) Acetophenone ii) Propanoic acid iii) Butanal iv) Benzyl alcohol.
b) Explain the working principle and applications of the following:
i) Paper electrophoresis ii) Power compensation DSC.

II. Write notes on:

(7 x 5 = 35)

1. Discuss IR molecular vibrations and the factors affecting molecular vibrations in I.R.
2. Brief account on Quantum numbers and their role in NMR Spectrometry.
3. Discuss about Electronic transitions in UV-Visible Spectroscopy.
4. Write about different types of ion exchanger used in ion exchange chromatography.
5. Discuss on instrumentation of double beam spectro fluorimetry.
6. Write a note on TGA.
7. Write a note on rotating crystal technique.

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

[M.PHARM 0423]

APRIL 2023
(OCTOBER 2022 EXAM SESSION)

Sub. Code: 2941

M.PHARMACY DEGREE EXAMINATION
SEMESTER - I (PCI New regulations 2016)
PHARMACEUTICAL CHEMISTRY - MPC
PAPER I – MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES

Q.P. Code: 262941

Time : Three hours

Answer ALL Questions

Maximum : 75 Marks

I. Elaborate on:

(2 x 20 = 40)

1. a) Write a detailed note on HPLC including principle, instrumentation and applications.
b) Define the terms: Retention time, Retention Volume and HETP.
2. a) Discuss the following in NMR spectroscopy:
i) Chemical shift ii) Coupling constant.
b) Explain the working principle and applications of the following:
i) Gel electrophoresis ii) DTA.

II. Write notes on:

(7 x 5 = 35)

1. Discuss IR interpretation of the following:
i) p-aminobenzoic acid ii) Ethyl benzene.
2. Brief account on C¹³ NMR.
3. Discuss the Beer Lambert's Law.
4. Write about different detecting methods used in Thin Layer chromatography.
5. Discuss the Jablonski diagram.
6. Write a note on working principle and applications of Affinity chromatography.
7. Write a note on Bragg's law and applications of X-ray crystallography.
