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

[LM 941] MAY 2018 **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 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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THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[LN 941] NOVEMBER 2018 **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 the principle, instrumentation and pharmaceutical applications of Gas Chromatography.
   b) Describe how an Infrared spectra is systematically interpreted?
   c) Detail about the interferences Flame emission spectroscopy.
2. Explain IR vibrational frequencies for:

   i) $CH_3 - \overset{O}{\overset{\|}{C}} - CH_3$ (Acetone).

   ii) $CH \equiv C - CH_2 - C \equiv CH$ (1, 5 – Penta-di-yne)

II. Write notes on: **(7 x 5 = 35)**

1. Principle, Instrumentation and pharmaceutical applications of DTA.
2. Isoelectric focusing and Zone electrophoresis.
3. Give an account on the principle and interferences of Atomic absorption spectroscopy.
4. Write about Chemical shift and spin-spin coupling and add a note on the factors influencing them.
5. Principle and applications of Potentiometry.
6. Explain how the calibration techniques are adopted in GC.
7. Explain the terms: a) Quenching effect b) Coupling constant
   c) Meta stable peak d) Bragg's law.

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

[LO 941] MAY 2019 **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) 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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THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[LP 941] NOVEMBER 2019 **Sub. Code: 2941**

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.

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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) $CH_3 - \overset{O}{\overset{\|}{C}} - C_6H_5$ (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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THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[MPHARM 0921] SEPTEMBER 2021 Sub. Code: 2941
(OCTOBER 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) 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 spectroflourimetry.
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.

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

[MPHARM 0422] APRIL 2022 Sub. Code: 2941
(OCTOBER 2021 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) 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 spectroflourimetry.
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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