MAY 2011

[KY 340] **Sub. Code: 2901**

M.PHARM. DEGREE EXAMINATION
(Regulations 2010)
(For candidates admitted from 2010-2011 onwards)

FIRST YEAR

PAPER I – MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES

(Common to all Branches)

Q.P. Code : 262901

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

Answer All questions

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

1. a) Briefly explain the proton exchange reaction in NMR spectroscopy. (5)
   b) Outline the salient features of NMR spectroscopy which are used in structural elucidation. (5)
2. Write a note on
   a) Quadrupole mass spectrometer.
   b) Theory behind mass spectroscopy.
3. Write the principle and working of ion exchange chromatography.
4. Explain briefly:
   a) IR detectors (5)
   b) Instrumentation of spectroflourimeter (5)
5. Explain briefly about fundamental vibration.
6. Discuss the various techniques employed in the assay of multicomponent mixture by UV spectrophotometer.

II. Write Short Notes on: **(8 x 5 = 40)**

1. What is theoretical plate and give its significance? How is it calculated?
2. Briefly explain the principle and application of flame emission spectrophotometer.
3. Write the criteria for fluorescence and its Pharmaceutical application.
4. Predict the signal position (δ value) in the NMR spectra of
   1) Benzyl alcohol 2) Ethyl benzene
5. Give the application of CD and ORD in Pharmacy.
6. The proposed structure for an organic compound shows m/e peak at 46, 31 and 29.confirm the structure by fragmentation mode.
7. Give the significance of Regression analysis and correlation coefficient.
8. Elution technique employed in HPTLC.

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October 2011

[KZ 340] **Sub. Code: 2901**

M.PHARM. DEGREE EXAMINATION

FIRST YEAR

PAPER I – MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES

(Common to all Branches)

Q.P. Code : 262901

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

Answer ALL questions in the same order.

I. Elaborate on :	**Pages (Max.)**	**Time (Max.)**	**Marks (Max.)**
1. (a) Explain the general fragmentation patterns for the interpretation of organic compounds in Mass Spectrometry. (b) Give the Mass interpretation patterns for the following organic compounds. (i) Benzyl alcohol (ii) 2 – Hexanone (iii) Benzaldehyde (iv) Benzamide.	17	40	20
2. (a) Write theory of fluorescence with neat diagram. (b) Explain the relationship between (i) Chemical structure and Fluorescent intensity (ii) pH and Fluorescent intensity.	17	40	20
II. Write notes on :			
1. Give the significance of students 't' test and F – test.	4	10	6
2. Write the principle and methods involved in Radio Immunoassay.	4	10	6
3. Briefly explain about Gel Electrophoresis.			
4. Compare and contrast Normal Phase Chromatography and Reverse Phase Chromatography.	4	10	6
5. How will you identify and determine the separated components from the mixture by Thin Layer Chromatography.	4	10	6
6. Write a brief account on Differential Scanning Calorimetry.	4	10	6
7. Define ORD and Octant rule. Write their applications with suitable examples.	4	10	6
8. How will you produce X – rays? Explain with neat diagram.	4	10	6
9. Explain the fundamental vibrations of the molecules in IR Spectrophotometry.	4	10	6
10. (a) Relationship between concentration and Fluorescence intensity. (b) Define Quenching. Write the types of Quenching.	4	10	6

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[LA 340] **MAY 2012** **Sub. Code: 2901**

M.PHARM. DEGREE EXAMINATION

FIRST YEAR

PAPER I – MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES

(Common to all Branches)

Q.P. Code: 262901

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

(180 Min)

Answer ALL questions in the same order.

I. Elaborate on:	**Pages (Max.)**	**Time (Max.)**	**Marks (Max.)**
1. a) Explain the theory of Electronic Spectroscopy and the different types of electronic transitions encountered in UV Spectroscopy. b) Explain the terms Chromophore and Auxochromes with examples. c) Discuss the Woodward Fieser Rules for calculating Absorption maximum in dienes.	17	40	20
2. a) Explain the different relaxation Process in NMR Spectroscopy by which a nucleus in an upper transition state returns to the lower state. b) Describe the instrumentation of an NMR Spectrophotometer. c) Draw a neat sketch of the NMR Spectrum you expect to get for 1, 1- dibromoethane	17	40	20
II. Write notes on :			
1. Describe the construction and working of the following: a) Hollow cathode lamp used as light source in Atomic Absorption Spectroscopy b) Photomultiplier Tube.	4	10	6
2. Draw a schematic diagram of a Gas Chromatograph set up and briefly explain the working.	4	10	6
3. Discuss the important features of the parent ion peak in Mass Spectrometry.	4	10	6
4. Discus the important factors affecting Differential Thermal Analysis.	4	10	6
5. Write a short note on the principle underlying Ion Exchange Chromatography.	4	10	6
6. State Bragg's Law. Explain the X-Ray Powder Diffraction method.	4	10	6
7. Explain Circular Dichroism and its relationship to Optical Rotatory Dispersion.	4	10	6
8. Explain the different Sampling Techniques employed in Infrared Spectrophotometry.	4	10	6
9. a)State the properties of Coefficient of Correlation. b) How will you interpret a value of r=0?	4	10	6
10. Discuss briefly the essential components of a research report.	4	10	6

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[LB 340] **NOVEMBER 2012** **Sub. Code: 2901**

M.PHARM. DEGREE EXAMS

FIRST YEAR

PAPER I – MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES

(Common to all Branches)

Q.P. Code : 262901

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

(180 Min)

Answer ALL questions in the same order.

I. Elaborate on :	**Pages (Max.)**	**Time (Max.)**	**Marks (Max.)**
1. a. Explain the principle and working of an High Performance Liquid Chromatography.	17	40	20
b. Elution technique employed in HPTLC.			
2. a. Discuss the principle and instrumentation of Nuclear Magnetic Resonance.	17	40	20
b. Explain the techniques of decoupling interaction between ^{13}C NMR and ^{1}H NMR.			
II. Write Notes on :			
1. Liquid Chromatography - Mass Spectroscopy **LC-MS**.	4	10	6
2. Explain the principle of Differential Scanning Colorimeter.	4	10	6
3. Give the construction and working principle of Time of flight mass analyzer.	4	10	6
4. Give the significance of Student's' test, regression analysis and correlation coefficient.	4	10	6
5. Discuss briefly about ESR and its applications.	4	10	6
6. Explain Optical Rotary Dispersion and Circular Dispersion.	4	10	6
7. Enumerate various detectors used in Gas chromatography.	4	10	6
8. List the applications of Atomic Absorption Spectroscopy.	4	10	6
9. Radio Immuno Assay.	4	10	6
10. Explain Mc Lafferty Rearrangement?	4	10	6

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[LC 340] **APRIL 2013** **Sub. Code: 2901**

M.PHARM. DEGREE EXAMS

FIRST YEAR

PAPER I – MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES

(Common to all Branches)

Q.P. Code : 262901

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

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

1. a. Explain the working of mass spectroscopy.
   b. Elaborate the criteria for fluorescence and its pharmaceutical applications.
2. a. Discuss the principle and applications of Nuclear Magnetic Resonance.
   b. Give an account of detectors used in Gas Chromatography.

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

1. Electron Spin Resonance spectroscopy.
2. Differential Scanning Colorimeter.
3. Explain the Principle and applications of Radio Immuno Assay.
4. Discuss the advantages of HPTLC over TLC.
5. Woodward's rule and its application.
6. What is circular dichorism? Explain this concept in relevance to optical rotatary dispersion?
7. Why it is necessary to apply statistical methods to analytical techniques? Add a note on Student's't' test.
8. Explain the sampling techniques used in infrared spectroscopy.
9. Capillary zone electrophoresis.
10. Briefly highlight citation of references.

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[LD 340] **OCTOBER 2013** **Sub. Code: 2901**

M.PHARM. DEGREE EXAMINATIONS

FIRST YEAR

PAPER I – MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES

(Common to all Branches)

Q.P. Code : 262901

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

Answer ALL questions in the same order.

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

1. a) Explain the principle and methodology of Differential Scanning Calorimetry (DSC).

   b) Discuss the working principle and instrumentation of HPLC (High Performance Liquid Chromatography).

2. a) Discuss the principle and instrumentation of mass spectroscopy.

   b) Enumerate the interfaces used in mass spectrometry and explain any one in detail.

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

1. Write a note on the principle of Radio Immuno Assay.
2. Discuss the following and mention the merits
   a) Ion exchange chromatography
   b) Affinity chromatography
3. Write a note on Chi-square test.
4. Give an account on sampling techniques in Infrared spectroscopy.
5. Discuss briefly Simultaneous equation method.
6. Write an account on
   a) Thermal conductivity detector.
   b) Argon ionisation detector.
7. Give an account on the instrumentation of Atomic Absorption Spectroscopy.
8. Write a note on Coupling constant and the factors influencing the value of coupling constant.
9. Discuss about detectors in IR spectroscopy.
10. Give an account on scientific writing of paper.

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[LE 340] **APRIL 2014** **Sub. Code: 2901**

M.PHARM. DEGREE EXAMS
FIRST YEAR
PAPER I – MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES
(Common to all Branches)

Q.P. Code : 262901

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

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

1. a) Explain the theory of Fluoresence and Phosphorescence with Jablanski diagram.
   b) Give an account on the instrumentation of Fluorescence.
   c) Write a note on factors affecting Fluorescence intensity.

2. a) Discuss the principle and instrumentation of nuclear magnetic resonance spectroscopy.
   b) Explain the term "chemical shift" and describe the factors affecting it with the aid of suitable examples.

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

1. What is McLafferty re-arrangement? How is it applicable in Structural diagnosis?
2. Discuss the following and mention the merits
   a) Zone electrophoresis
   b) Isoelectric focussing
3. Write a note on Students T test.
4. Give an account on Thermo Mechanical Analysis (TMA).
5. Discuss briefly derivative UV spectroscopy.
6. Write a note on development techniques and detecting agents In Paper Chromatography.
7. Discuss the principle of High Performance thin layer Chromatography (HPTLC).
8. Write a note on the theory & applications of IR.
9. Write the principle involved in Flame emission spectroscopy.
10. Write a note on LC-MS.

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[LF 340] **OCTOBER 2014** **Sub. Code: 2901**

M.PHARM. DEGREE EXAMINATION
FIRST YEAR
PAPER I – MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES
(Common to all Branches)

Q.P. Code : 262901

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

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

1. a) Explain the different elution techniques used in High Performance Thin layer chromatography (HPTLC).
   b) Discuss about the molecular vibrations, and the instrumentation of I.R Spectroscopy.
2. a) Explain the theory of U.V absorption and add a note on effect of Auxochromes on Chromophores.
   b) Explain the construction and functioning of a single beam U.V Spectro Photometer.
   c) Discuss the application of woodward- Fieser Rules taking α, β-Unsaturated Ketones as examples.

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

1. Write a brief account on the applications of
   a) Atomic Absorption Spectroscopy b) Thermo gravimetric Analysis (TGA)
2. Discuss briefly the theory of
   a) Ion Exchange Chromatography b) Radio Immuno Assay
3. Explain the theory behind the important aspects of molecular fragmentation in mass spectroscopy.
4. Write a note on circular dichroism and its relation to ORD.
5. Discuss the principle of different Ionization techniques used in Mass spectrometers.
6. Predict and explain the signal positions (δ value) and spin-spin splitting in the NMR spectra of a) Butanal b) 2- Chloropropane
7. Discuss about the importance of proton exchange reactions and Nuclear Overhauser Effect (NOE) in NMR Spectroscopy.
8. Define Quenching and explain the factors responsible for Quenching in Fluorescence spectroscopic analysis.
9. Explain the statistical significance of F- test and Chi-square test.
10. State Bragg's law and discuss about the applications of X- ray Diffraction method.

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[LG 340] **APRIL 2015** **Sub. Code: 2901**

M.PHARM. DEGREE EXAMINATION

FIRST YEAR

PAPER I – MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES
(Common to all Branches)

Q.P. Code : 262901

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

Answer ALL questions

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

1. a) Explain the construction and working principle of Time of flight of mass analyser.

   b) Explain in detail with examples the fragmentation pattern of organic compounds by mass spectroscopy.

2. a) Explain the principle, instrumentation and Pharmaceutical applications of DSC.

   b) Explain the principle and instrumentation of Nuclear magnetic spectroscopy.

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

1. With a neat diagram explain the construction and working of Hollow cathode lamp and Photomultiplier tube.

2. Explain the fundamental vibrations of the molecules in IR spectrophotometry.

3. Discuss theory of fluorescence with Jablonski diagram.

4. Write short notes on Chi-square test, correlation and regression.

5. Give an account of detectors used in HPLC.

6. Write a note on 13C-NMR and coupling constant.

7. Discuss the principle and applications of Radio Immuno Assay.

8. Briefly explain reverse phase chromatography and two dimensional chromatography.

9. Explain the application and various interferences occurring in Flame emission spectroscopy.

10. Write a note on thesis writing and citation of references.

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[LH 340] **OCTOBER 2015** **Sub. Code: 2901**

M.PHARM. DEGREE EXAMINATION
(Common to all Branches)
FIRST YEAR
PAPER I – MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES

Q.P. Code: 262901

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

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

1. a) With a neat diagram, explain the construction and working of double beam UV-Vis Spectrophotometer.
   b) Describe the principle and instrumentation of double beam Spectrofluorimeter.

2. a) Describe the principle and working of HPLC with a neat labeled diagram.
   b) With a neat diagram, explain the principle and instrumentation of GLC.

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

1. Students “t” test.
2. Radio Immuno Assay.
3. COSY and NOE.
4. Bragg’s law and X-ray powder diffraction.
5. HPTLC.
6. Differential Thermal Analysis.
7. Cotton effect, octant rule and its applications with examples.
8. Atomic absorption spectroscopy.
9. FT-IR and ATR.
10. McLafferty rearrangement and its significance in structural diagnosis.

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[LI 340] APRIL 2016 **Sub. Code: 2901**

M.PHARM. DEGREE EXAMINATION
(Common to all Branches)
FIRST YEAR
PAPER I – MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES

Q.P. Code: 262901

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

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

1. a) Discuss about the molecular vibrations, and the instrumentation of IR spectroscopy.
   b) Discuss the principle of different Ionization techniques used in Mass spectroscopy.

2. a) Write theory of Fluorescence with neat diagram.
   b) Explain the relationship between:
      i) Chemical structure and Fluorescent intensity.
      ii) pH and Fluorescent intensity.

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

1. Derive Bragg's law and discuss the applications of X-ray diffraction method.
2. Write a note on circular Dichroism and its relation to ORD.
3. Write the principle involved in Flame emission spectroscopy.
4. Write a note on the principle of Radio Immuno Assay.
5. Write a note on coupling constant and the factors influencing the value of coupling constant.
6. Give an account on scientific writing of paper.
7. How do you calculate the absorption maximum wavelength for Dienes with Wood ward Fisher rules?
8. Why is it necessary to apply statistical methods to analytical techniques? Add a note on Chi-Square test.
9. Discuss briefly about ESR and its application.
10. Explain briefly about Gel Electrophoresis.

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[LJ 340] OCTOBER 2016 **Sub. Code: 2901**

M.PHARM. DEGREE EXAMINATION
(Common to all Branches)
FIRST YEAR
PAPER I – MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES

Q.P. Code : 262901

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

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

1. a) Explain the theory involved in fluorescence and Phosphorescence with the help of jablonski diagram.
   b) Write a note on factors affecting fluorescent intensity.

2. a) Explain the construction and working of Qudrapole mass analyser.
   b) Explain the fragmentation rules of organic compounds by Mass Spectroscopy in detail.

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

1. Write a note on Woodward-Fischer rules for calculating absorption maximum.
2. Write the principle involved in atomic absorption Spectroscopy.
3. Explain the sample handling techniques in Infra red Spectroscopy.
4. Explain the terms: a) Chemical shift b) Spin-Spin coupling.
5. Write the applications of differential Scanning Calorimetry.
6. Explain the principle involved in supercritical fluid chromatography.
7. Give the different methods of Radioimmunoassay.
8. Explain the statistical significance of Chi-square test and F-test.
9. Write a note on citation of references.
10. What is octant rule? Give its applications with examples.

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[LK 340] MAY 2017 **Sub. Code: 2901**

M.PHARM. DEGREE EXAMINATION
(Common to all Branches)
FIRST YEAR
PAPER I – MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES

Q.P. Code : 262901

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

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

1. a) Explain the principle and instrumentation of infrared spectrophotometer with a neat diagram.
   b) Discuss the various techniques employed in the assay of multicomponent mixture by UV spectrophotometer.

2. a) What is electrophoresis? Explain the principle, instrumentation and applications of Gel electrophoresis.
   b) Describe the theory, instrumentation and applications of DTA.

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

1. Discuss the theory involved in fluorescence with the help of Jablonski diagram.
2. With a neat diagram explain the construction and working of Hollow cathode lamp and Photomultiplier tube.
3. Explain normal phase, reverse phase and two dimensional chromatography.
4. Write short notes on Quenching.
5. Write short notes on Chi-square test and student ‘t’ test.
6. Write a note on the theoretical aspects of NMR and ESR.
7. Explain the various development techniques and applications of paper chromatography.
8. How X-rays are generated? Briefly explain X-ray powder diffraction method.
9. Write an account on detectors used in HPLC.
10. Describe the principle involved in mass spectroscopy.

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[LL 340] OCTOBER 2017 **Sub. Code: 2901**

M.PHARM. DEGREE EXAMINATION
(Common to all Branches)
FIRST YEAR
PAPER I – MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES

Q.P. Code : 262901

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

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

1. a) Explain the construction and working principle of Time of flight mass analyser.
   b) Explain in detail with examples the fragmentation pattern of organic compounds by mass spectroscopy.

2. a) With neat labeled diagram, explain the principle and instrumentation of High pressure liquid chromatography.
   b) Write in detail about the various factors affecting chemical shift.

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

1. Write a note on ^{13}C-NMR and NOE.
2. Discuss about FTIR and ATR.
3. Write the principle and working of ion exchange chromatography.
4. What is the significance of statistical methods? Explain variance and normal distribution.
5. Explain the application and various interferences occurring in Flame emission spectroscopy.
6. Write short notes on HPTLC.
7. Explain how Woodward-Fischer rules are useful for calculating absorption maximum for dienes, carbonyl and aromatic compounds.
8. Explain the principle of TGA and TMA.
9. Describe the principle and instrumentation of ESR.
10. Write a note on Bragg's law and application of X-ray diffraction technique.

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

[LM 340] MAY 2018 **Sub. Code: 2901**

M.PHARM. DEGREE EXAMINATION
(Common to all Branches)
FIRST YEAR
PAPER I – MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES

Q.P. Code : 262901

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

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

1. a) Describe the different electronic transitions involved in UV spectrophotometry with examples.
   b) Discuss the principle and instrumentation of nuclear magnetic spectroscopy.

2. a) With neat labeled diagram, explain the principle and instrumentation of Gas liquid Chromatography.
   b) Explain the principle and instrumentation of spectrofluorimeter with a neat diagram.

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

1. Write the theory and various types of ions produced in mass spectroscopy.
2. Describe the principle and instrumentation of DSC.
3. Discuss the principle and applications of flame emission spectroscopy.
4. Explain optical rotatory dispersion and circular dichroism with examples.
5. Write a note on degree of freedom, correlation and regression.
6. Explain the principle involved in supercritical fluid chromatography.
7. Discuss the fundamental vibrations of the molecules in IR spectrophotometry.
8. Write short notes on Radioimmunoassay.
9. Write a note on citation of references.
10. What is coupling constant? Briefly explain the various factors affecting the coupling constant.

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

[LN 340] OCTOBER 2018 **Sub. Code: 2901**

M.PHARM. DEGREE EXAMINATION
(Common to all Branches)
FIRST YEAR
PAPER I – MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES

Q.P. Code : 262901

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

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

1. a) Explain the simultaneous equation method and absorbance correction method for the analysis of multi component dosage forms by UV spectrophotometry.

   b) Write the principle of spectrofluorimetry with a neat labeled diagram and write the relationship between concentration and fluorescence intensity.

2. a) Write a note on FT-IR and ATR.

   b) Write a note on ^{13}C-NMR.

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

1. Explain the various types of ions produced in mass spectrometry.
2. Write a note on circular dichroism.
3. What are the interfaces used in LC-MS? Explain about moving belt interface.
4. Write a note on differential scanning calorimetry.
5. Write short notes on gel electrophoresis.
6. Write a note on precision and accuracy.
7. Briefly explain about super critical fluid chromatography.
8. Write a note on Mc Lafferty rearrangement.
9. Explain the sampling techniques used in IR spectrophotometry.
10. How will calculate the absorbance maximum by using Woodward-Fiesher rule?

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

[LO 340] MAY 2019 **Sub. Code: 2901**

M.PHARM. DEGREE EXAMINATION
(Common to all Branches)
FIRST YEAR
PAPER I – MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES

Q.P. Code : 262901

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

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

1. a) Write the general fragmentation patterns for the interpretation of organic molecules in mass spectrometry.
   b) Explain in detail about Radio immuno assay.

2. a) Discuss in detail about the factors affecting the vibrational frequency.
   b) Explain in detail about spin-spin coupling and write the factors affecting coupling constant values.

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

1. Write the principle of X-ray diffraction analysis. How will you determine the crystal structure by powder crystal method?
2. Explain the types of electronic transitions in UV- Visible spectrophotometry.
3. Write the mass analyzers used in mass spectrometry. Explain the working principle of Time of Flight mass analyser with a neat diagram.
4. Write a note on HPTLC.
5. Write the effect of conjugation and pH on absorption of radiation by the molecules.
6. Explain quenching and its types. Write the effect of pH on fluorescence intensity.
7. Write a note on nuclear magnetic double resonance.
8. Describe the mass interpretation pattern for benzaldehyde.
9. Explain the terms chromophore and auxochrome with suitable examples.
10. Write a note on thesis writing and citation of references.

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

[LP 340] OCTOBER 2019 **Sub. Code: 2901**

M.PHARM. DEGREE EXAMINATION
(Common to all Branches)
FIRST YEAR
PAPER I – MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES

Q.P. Code : 262901

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

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

1. a) With a help of a neat sketch explain the various components and working principle of double beam spectrophotometer.
   b) Give a detail note on factors affecting spin-spin coupling.

2. a) Explain the principle and instrumentation of Gas Chromatography.
   b) Discuss in detail about affinity chromatography and column chromatography.

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

1. Give the construction, principle and operation of Total consumption burner and pre-mixed burner.
2. Explain the advantages of HPTLC over TLC & Paper Chromatography.
3. Write the principle and advantages of FT-IR & Attenuated Total Reflectance over dispersive IR.
4. Define electrophoresis. Classify with examples and add a note on Iso Electric Focusing.
5. Briefly explain ORD, Circular dichroism and production of X-rays.
6. Explain the statistical significance of student's t-test & add a note on classification of errors.
7. Give an account on applications of Radio Immuno Assay techniques.
8. Discuss about TG curve and its applications.
9. Define molar absorptivity and absorption law and its limitations.
10. Write a note on matrix assisted laser desorption ionization mass spectroscopy.

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

[LQ 0121] JANUARY 2021 Sub. Code: 2901

(APRIL 2020 EXAM SESSION)

M.PHARMACY DEGREE EXAMINATION

FIRST YEAR - (Common to all Branches)

PAPER I – MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES

Q.P. Code : 262901

Time : Three hours **Answer ALL Questions** **Maximum : 100 Marks**

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

1. a) With a help of a neat sketch explain the various components and working principle of double beam spectrophotometer.
   b) Give a detail note on factors affecting spin-spin coupling.

2. a) Explain the principle and instrumentation of Gas Chromatography.
   b) Discuss in detail about affinity chromatography and column chromatography.

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

1. Give the construction, principle and operation of Total consumption burner and pre-mixed burner.
2. Explain the advantages of HPTLC over TLC & Paper Chromatography.
3. Write the principle and advantages of FT-IR & Attenuated Total Reflectance over dispersive IR.
4. Define electrophoresis. Classify with examples and add a note on Iso Electric Focusing.
5. Briefly explain ORD, Circular dichroism and production of X-rays.
6. Explain the statistical significance of student's t-test & add a note on classification of errors.
7. Give an account on applications of Radio Immuno Assay techniques.
8. Discuss about TG curve and its applications.
9. Define molar absorptivity and absorption law and its limitations.
10. Write a note on matrix assisted laser desorption ionization mass spectroscopy.

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

[MPHARM 0921] SEPTEMBER 2021 Sub. Code: 2901
(OCTOBER 2020 EXAM SESSION)

M.PHARMACY DEGREE EXAMINATION
FIRST YEAR - (Common to all Branches)
PAPER I – MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES
Q.P. Code : 262901

Time : Three hours **Answer ALL Questions** **Maximum : 100 Marks**

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

1. a) Compare and contrast atomic absorption spectroscopy versus flame emission spectroscopy.
   b) Construction and working of Flame ionisation detector, Thermal conductivity detector and Electron capture detector.

2. a) State the important laws governing UV absorption and derive the mathematical expression for the combined laws.
   b) Explain the theory and application of Thermo Gravimetric Analysis with an example. Add a note on plain curves and curves with cotton effect.

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

1. Explain the principle and theory of mass spectroscopy.
2. Explain single pass and double pass prism monochromator.
3. Briefly explain chiral HPLC.
4. Explain the contents for writing of thesis.
5. Explain various steps involved in HPTLC method.
6. Describe the theory of moving boundry electrophoresis and ESR Spectroscopy.
7. Briefly explain Radio immuno assay.
8. Write a note on ion exchange chromatography.
9. Give an account on reliability of results and student's 't'- test.
10. Discuss on proton exchange reactions and spin-spin decoupling.

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

[MPHARM 0122] JANUARY 2022 Sub. Code: 2901
(APRIL 2021 EXAM SESSION)

M.PHARMACY DEGREE EXAMINATION
FIRST YEAR - (Common to all Branches)
PAPER I – MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES
Q.P. Code : 262901

Time : Three hours **Answer ALL Questions** **Maximum : 100 Marks**

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

1. a) Explain in detail about the theory and instrumentation of NMR.
   b) Classify chromatographic methods based on mechanism of separation and add a note on Super Critical Fluid Chromatography.

2. a) Explain the theory of spectrofluorimetric method and give a comparison of fluorescence and UV-Visible absorption method.
   b) Discuss in detail the various factors affecting vibrational frequency.

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

1. Write a note on generation of X-rays and law governing X-ray diffraction.
2. Explain theory and methods in radio immuno assay and its applications.
3. Discuss on probability, accuracy, precision and Confidence interval.
4. Briefly explain the writing and presentation of thesis.
5. Give an account on principle and methodology of thermogravimetric analysis.
6. Describe stationary phases used in HPLC and GLC.
7. Explain the general fragmentation mode in mass spectroscopy.
8. Write the differences between ESR and NMR.
9. Discuss on various types of elution techniques in Column chromatography.
10. With the help of neat diagram, write the working principle of Atomic absorption spectroscopy. Add a note on its interferences.

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

[MPHARM 0422] APRIL 2022 Sub. Code: 2901
(OCTOBER 2021 EXAM SESSION)

M.PHARMACY DEGREE EXAMINATION
FIRST YEAR - (Common to all Branches)
PAPER I – MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES
Q.P. Code : 262901

Time : Three hours **Answer ALL Questions** **Maximum : 100 Marks**

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

1. a) Compare and contrast Atomic Absorption Spectroscopy versus Flame Emission Spectroscopy.
   b) Construction and working of Flame Ionization Detector, Thermal Conductivity Detector.

2. a) Explain the theory and application of Thermo Gravimetric Analysis with an example.
   b) State the important Laws governing UV absorption and derive the mathematical expression for the combined laws.

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

1. Write a note on ion exchange chromatography.
2. Explain single pass and double pass prism monochromator.
3. Discuss on probability, accuracy, precision and Confidence interval.
4. Briefly explain the Radio Immuno Assay.
5. Give an account on reliability of results and students‘t’ test.
6. Describe various steps involved in HPTLC.
7. Explain the general fragmentation mode in mass spectroscopy.
8. Write the differences between ESR and NMR.
9. Discuss on various types of elution techniques in Column chromatography.
10. Discuss on proton exchange reactions and spin – spin decoupling.

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

[M.PHARM 0922] **SEPTEMBER 2022** **Sub. Code: 2901**
(APRIL 2022 EXAM SESSION)

M.PHARMACY DEGREE EXAMINATION
FIRST YEAR – (Common to all Branches)
PAPER I – MODERN PHARMACEUTICAL ANALYTIC TECHNIQUES

Q.P. Code: 262901

Time : Three hours **Answer ALL Questions** **Maximum : 100 Marks**

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

1. Explain process of fluorescence, factors affecting fluorescence and applications of spectrofluorimetry in pharmaceutical field.

2. Principle and instrumentation of HPLC.
   b) Application of HPLC.

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

1. Theory of UV absorption by molecules.
2. Zone electrophoresis.
3. Ionization methods in Mass spectroscopy.
4. Chemical shift.
5. Interferences in flame photometry.
6. ORD.
7. Brgg's law.
8. T-test and F-test.
9. Ion exchange chromatography.
10. Thermal methods of analysis.

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

[M.PHARM 0423] APRIL 2023 Sub. Code: 2901
(OCTOBER 2022 EXAM SESSION)

M.PHARMACY DEGREE EXAMINATION
FIRST YEAR – (Common to all Branches)
PAPER I – MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES

Q.P. Code: 262901

Time : Three hours **Answer ALL Questions** **Maximum : 100 Marks**

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

1. a) Give fragmentation rules for organic molecules in Mass spectrometry.
   b) Write the principle of Mass spectrometry.

2. a) Draw, Label and working of a Double beam UV spectrophotometer.
   b) Explain chromophore concepts in UV.

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

1. Principles of NMR.
2. Basic concept of IR interpretation.
3. HPLC detectors.
4. Instrumentation of gas chromatography.
5. X-ray diffraction methods and applications.
6. Write on Cotton effect.
7. DSC and its application.
8. Write on super critical fluid chromatography.
9. Give an account on Radio Immunoassay.
10. Briefly write on Correlation and Regression.

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

[M.PHARM 0823] AUGUST 2023 Sub. Code: 2901
(APRIL 2023 EXAM SESSION)

M.PHARMACY DEGREE EXAMINATION
FIRST YEAR – (Common to all Branches)
PAPER I – MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES

Q.P. Code: 262901

Time : Three hours **Answer ALL Questions** **Maximum : 100 Marks**

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

1. a) Define Chemical shift. Explain the factors affecting chemical shift.
   b) State and derive Beer – Lambert's law and write the deviations from Beer's law.

2. a) Explain the working principle of any three detectors used in IR spectrophotometry.
   b) Write in detail about Themogravimetric analysis.

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

1. Write the interferences produced in flame photometry. How will you overcome?
2. Explain in detail the structural relationship and fluorescence intensity with examples.
3. Write the principle involved in Mass spectrometry.
4. Write a note on Nuclear Overhauser Enhancement (NOE) with example.
5. What are the detectors used in Gas chromatography? Explain flame ionization detector with a neat labeled diagram.
6. Write a note on isoelectric focusing electrophoresis.
7. Write a note on student's "t" and F test with their significance.
8. Define hyperfine splitting. Explain with suitable example.
9. Write a note on principle and application of X-ray diffraction.
10. Write a note on quadrapole mass analyser.

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

[M.PHARM 0524] MAY 2024 Sub. Code: 2901
(APRIL 2024 EXAM SESSION)

M.PHARMACY DEGREE EXAMINATION
FIRST YEAR – (Common to all Branches)
PAPER I – MODERN PHARMACEUTICAL ANALYTICAL TECHNIQUES

Q.P. Code: 262901

Time: Three hours **Answer ALL Questions** **Maximum: 100 Marks**

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

1. a) Explain the techniques involved in Radio immuno Assay.
   b) Explain in detail the various factors affecting the vibrational frequency with examples.

2. a) Describe the factors affecting chemical shift with suitable examples.
   b) Discuss the general fragmentation pattern and rules for the interpretation of mass spectra.

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

1. Explain how will you overcome the interferences produced in flame photometry?
2. Discuss briefly the principle and application of Electron Spin Resonance Spectroscopy.
3. Define Bragg's law and discuss the application of X-ray diffraction method.
4. Outline Thermo gravimetric method of analysis with examples.
5. Define Electrophoresis. Explain about moving boundary electrophoresis.
6. Describe the principle and applications of affinity chromatography.
7. Describe the different types of electronic transitions involved absorption of ultra violet radiation.
8. Explain the principle of Spectrofluorimetry with Jablonski diagram.
9. How will you determine the absorption maximum of a compound by applying Woodward –Fieser rule? Give examples.
10. Explain the followings:
    a) Mc Lafferty Rearrangement b) Metastable ion.

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