**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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