

[KQ 289] MARCH 2007 Sub. Code : 2801

M.Pharm. DEGREE EXAMINATION.

(Revised Regulations)

First Year

Paper I — MODERN PHARMACEUTICAL
ANALYTICAL TECHNIQUES

(Common to all Branches)

Time : Three hours Maximum : 100 marks

Theory : Two hours and Theory : 80 marks
forty minutes

M.C.Q. : Twenty minutes M.C.Q. : 20 marks

Answer ALL questions.

I. Long Essay :

1. Explain the theory and principles of Atomic Absorption spectrophotometry. How will you eliminate spectral and chemical interference in Atomic Absorption Spectroscopy? Compare the sensitivity of Atomic Absorption Spectroscopy and Flame Photometry. (20)

2. With suitable diagram explain the construction and working of

- (a) Halo cathode Lamp
- (b) Graphite Furnace. (8 + 7 = 15)

3. Explain the following with respect to mass spectrometry

(a) Theory and principle of Electron Impact mass spectrometry with magnetic deflection analyser.

(b) Matrix Assisted Laser Desorption Ionisation

(c) Chemical Ionisation. (7 + 5 + 3 = 15)

II. Short notes on : (6 × 5 = 30)

1. Types of electronic transition and their use in analysis, with examples.

2. Construction and working of Interferometer in FTIR.

3. Difference between PMR and ^{13}C NMR with respect to sensitivity and Spin-Spin Coupling.

4. Capillary zone electrophoresis

5. Relation between chemical structure and fluorescence.

6. Principle and Pharmaceutical applications of DSC.

[KQ 315]

MARCH 2007

Sub. Code : 2851

M.Pharm. DEGREE EXAMINATION.

(Regulation 2006)

First Year

Paper I — MODERN PHARMACEUTICAL
ANALYTICAL TECHNIQUES

(Common to all Branches)

Time : Three hours

Maximum : 100 marks

Theory : Two hours and
forty minutes

Theory : 80 marks

M.C.Q. : Twenty minutes

M.C.Q. : 20 marks

Answer ALL questions.

I. Long Essay :

1. (a) Outline methodology of moving boundary electrophoresis technique. Write any two important applications of electrophoresis.

(b) What do you mean by MALDI-MS? Write the importance of this technique in mass spectroscopy.

(10 + 10)

2. What are the different components of High performance liquid chromatograph? What are their roles in the equipment? Add a note on column types used in HPLC? (15)

3. What are the principles of spin-spin decoupling? Describe any three methods of decoupling. Write the significance of C-13 NMR spectroscopy in the structure elucidation of organic molecules. (15)

II. Short notes :

(6 × 5 = 30)

1. What is circular dichroism? Explain this concept in relevance to optical rotatory dispersion.

2. Why is it necessary to apply statistical methods to analytical techniques? Add a note on chi-square test.

3. Write the principles involved in the techniques of HPTLC and Super critical fluid chromatography.

4. Outline the objectives of derivatization process in Gas chromatography. Mention the process and chemistry involved in derivatization of amino acids.

5. Write the infra-red absorption frequencies, mass fragmentation patterns and low resolution as well as high resolution nmr spectral features for 'phenyl-acetic acid'.

6. How do you calculate the absorption maximum wavelength for Dienes with Woodward-fisher rules?

SEPTEMBER 2007

[KR 289]

Sub. Code : 2801

M.Pharm. DEGREE EXAMINATION.

(Revised Regulations)

First Year

Paper I — MODERN PHARMACEUTICAL
ANALYTICAL TECHNIQUES

(Common to all Branches)

Time : Three hours

Maximum : 100 marks

Theory : Two hours and
forty minutes

Theory : 80 marks

M.C.Q. : Twenty minutes

M.C.Q. : 20 marks

Answer ALL questions.

I. Long Essay : (20)

1. (a) Why are the absorption bands in a UV spectrum very broad when compared to IR or NMR spectra? What are the factors that govern the position and intensity of the absorption bands in UV spectrum? Give the analytical applications of UV-visible spectrophotometry.

SEPTEMBER 2007

(b) Discuss the general appearance of IR spectrum of normal alkane. What are the changes in the above spectrum seen upon the introduction of following structural residues?

- (i) Alkene
- (ii) Alcohol-OH
- (iii) Carbonyl.

(2 × 15 = 30)

2. (a) Explain the theory of PMR Spectroscopy.

(b) What is Spin-spin splitting? Give the rules that characterise the spin-spin splitting of PMR resonance peak.

3. (a) Outline the instrumentation of mass spectrometry with special reference to different types of mass analyser.

(b) Write notes on :

- (i) Mc Lafferty rearrangement.
- (ii) Isotope effect in mass spectroscopy.

II. Short notes : (6 × 5 = 30)

1. Explain the principle of ESR. How do you compare ESR with NMR method.

2. Explain the principle and significance of interferences involved in Flame emission spectroscopy.

3. What is Bragg's Law? Explain its significance.

4. Discuss the significance of Student's *T*-test, *F*-test and Chi-square in statistical analysis.

5. Write an account on Fundamental Principles of ORD.

6. Explain the significance of different types of ions formed in Mass Spectra.

SEPTEMBER 2007

[KR 315]

Sub. Code : 2851

M.Pharm. DEGREE EXAMINATION.

(Regulation 2006)

First Year

Paper I — MODERN PHARMACEUTICAL
ANALYTICAL TECHNIQUES

(Common to all Branches)

Time : Three hours

Maximum : 100 marks

Theory : Two hours and
forty minutes

Theory : 80 marks

M.C.Q. : Twenty minutes

M.C.Q. : 20 marks

I. Long Essay :

1. (a) Explain diagrammatically the working of a spectrofluorimeter. (10)

(b) Discuss the theory of fluorescence and phosphorescence. (5)

(c) What are the applications of fluorimetry in quality control of drugs? (5)

2. (a) Describe different parts of a HPLC with a block diagram. (7)

(b) Explain the principles and applications of : (4 + 4 = 8)

(i) Super critical fluid chromatography.

(ii) Ion-exchange chromatography.

3. Discuss the following in detail : (3 × 5 = 15)

(a) Spin-spin coupling.

(b) Chemical shift.

(c) Proton exchange reaction.

II. Short notes : (6 × 5 = 30)

1. Write the applications of I.R. Spectroscopy in quality control of drugs and research.

2. Explain the principle of :

(a) Matrix assisted laser desorption.

(b) Fast atom bombardment ionisation.

3. Discuss the principle and applications of X-ray diffraction technique.

4. What is the principle involved in Radio immuno assay? What are its applications?

5. Explain the principle and applications of DTA.

6. What are the applications of AAS? Mention the advantages of AAS over Flame Photometry.