

[KI 268] APRIL 2003 Sub. Code : 2001

M.Pharm. DEGREE EXAMINATION

(New Regulations)

First Year

Paper I — MODERN PHARMACEUTICAL  
ANALYTICAL TECHNIQUES

(Common to all branches)

Time : Three hours Maximum : 100 marks

Answer any FOUR questions.

All questions carry equal marks.

(a) Explain the fragmentation rules in mass spectroscopy. (13)

(b) Predict the fragmentation pattern for the following compounds, give reasons :

(i) 2, 2-dimethyl pentane

(ii) 1-Phenyl ethanol

(iii) 9, 10-anthra quinone. (12)

1. (a) Describe an analytical methods using microbiological assay for determinations of vitamin combinations. (15)

(b) Explain briefly NMR and its applications. (10)

3. (a) Explain the principle, applications in pharmacy, and instrumentation of UV/Visible spectroscopy. (13)

(b) Give an account of detectors used in gas chromatography. (12)

4. (a) What are the factors influencing vibrational frequencies? Explain with examples how IR spectra used for the identification of functional groups. (10)

(b) Describe the instrumentation and working of fluorimeter. Write a detailed note on quenching. (10)

(c) Write a note on quantitative IR spectrophotometry. (5)

5. (a) What is electrophoresis? Explain with example the method of paper electrophoresis, and instrumentation used for paper electrophoresis. (13)

(b) Write an account of cotton effects and circular dichroism. (12)

6. (a) What is polarography? Write the construction and working of a polarograph. (13)

(b) Explain the terms : (12)

(i) Halfwave potential

(ii) Residual current

(iii) Limiting current

(iv) Ilkovic equation.

APRIL 2003

[KI 289]

Sub. Code : 1001

M.Pharm. DEGREE EXAMINATION.

(Revised Regulations)

First Year

Paper I — MODERN PHARMACEUTICAL  
ANALYTICAL TECHNIQUES

(Common to all Branches)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

All questions carry equal marks.

1. (a) What is the principle involved in thermo gravimetric analysis? Explain. List out its applications in pharmacy. (10)

(b) What is the principle and applications of supercritical fluid chromatography? (8)

(c) Write a note on Radio Immuno Assay and its application. (7)

2. (a) Write a short note on :

(i) Differential scanning calorimetry

(ii) Electron spin resonance spectroscopy.

(8 + 8)

(b) What are the requirements for a molecule to exhibit fluorescence? Explain. (9)

3. (a) Explain the instrumentation of NMR spectrometer. (10)

(b) Give an account of detectors used in gas chromatography. (15)

4. (a) What is the principle involved in flame emission spectroscopy? Discuss its instrumentation and application in pharmacy. (13)

(b) Give a brief account of

(i) Metastable peaks

(ii) Nitrogen rule

(iii) Mc-Lafferty rearrangement. (3 × 4 = 12)

OCTOBER 2003

[KJ 268]

Sub. Code : 2001

M.Pharm. DEGREE EXAMINATION.

(New Regulations)

First Year

Paper I — MODERN PHARMACEUTICAL  
ANALYTICAL TECHNIQUES

(Common to all branches)

Time : Three hours

Maximum : 100 marks

Calculators may be permitted.

Answer any FOUR questions.

- L. (a) Write briefly the principle, instrumentation of IR. spectrophotometry. (12)
- (b) List applications of capillary electrophoresis and photon magnetic resonance spectroscopy. (8)
- (c) A 8.44 PPM solution of  $\text{FeSCN}^{2-}$  (mol int 113.9) has a transmittance, in a 1 cm cell at 580 nm, of 0.295. Calculate the molar absorptivity for the complex at this wavelength. (5)

OCTOBER 2003

2. (a) Write briefly with appropriate illustrations, equations the principle of NMR spectroscopy. (12)

(b) Explain chemical shift and spin-spin coupling. (8)

(c) How do you explain the chemical shift data of the following compounds? (5)

(i) Benzene —  $C_6H_6$ ,  $\delta = 7.37$

(ii) Acetylene —  $C_2H_2$ ,  $\delta = 2.9$

(iii) Toluene —  $C_6H_5CH_3$ ,  $\delta = 2.32$

(iv) Cyclohexene —  $C_6H_{12}$ ,  $\delta = 5.57$ .

3. (a) Describe the instrumentation and working of mass spectrometer. (12)

(b) Write notes on fluorescence and chemical structure. (8)

(c) The following data was obtained from mass spectra of a compound. Interpret and report the structure of the same

(i) molecular formula  $C_8H_8O$

(ii) m/e ratios at 120, 105, 77, 51, 43 and 28.

(5)

4. (a) Explain with illustrations the instrumentation and working of HPLC. (12)

(b) Write notes on Radio immuno assay with pharmaceutical applications. (7)

(c) Define the following with equations : (6)

(i) Capacity factor

(ii) Resolution

(iii) Selectivity factor.

5. (a) Write a note on X-Ray generation and interpretation of X-Ray powder diffraction data. (13)

(b) Bragg's law and its applications. (12)

6. Explain the terms :

(a) Half wave potential. (6)

(b) Residual current. (6)

(c) Limiting current. (6)

(d) Ilkovic equation. (7)

OCTOBER 2003

[KJ 289]

Sub. Code : 1001

M.Pharm. DEGREE EXAMINATION.

(Revised Regulations)

First Year

Paper I — MODERN PHARMACEUTICAL  
ANALYTICAL TECHNIQUES

(Common to all Branches)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

All questions carry equal marks.

1. (a) Explain Beer-Lambert law. Describe the working of a *u.v* visible spectro photometer. Enumerate the application of *u.v* in pharmacy. (7 + 7)  
(b) Write a note on atomic absorption spectroscopy. (6)  
(c) Write the principle of fluorimetry. (5)
2. (a) Describe the principle and working of flame emission spectroscopy and its application. (6 + 6)  
(b) Write a note on capillary electrophoresis. (8)  
(c) What is ion exchange chromatography? (5)

3. (a) Discuss in detail the principle behind mass spectroscopy. Explain how the different fragments formed help in interpretation of the spectra taking specific examples. (10)  
(b) Explain the following terms : (8)
  - (i) Base peak
  - (ii) Metastable peak
  - (iii) Nitrogen rule.
- (c) Write a note on spin-spin coupling. (7)
4. (a) Discuss in detail the instrumentation of high pressure liquid chromatography. (10)  
(b) Write a note on field desorption MS. (8)  
(c) Explain chemical shift with specific examples. (7)