

[KO 289] MARCH 2006 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

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 : (2 × 15 = 30)

I. (a) Sketch a dispersive IR instrument and a Fourier Transform IR instrument. What is the difference between these instruments? (7)

(b) Give an account on the principle of mass spectroscopy. Select two compounds and comment on their fragmentation pattern. (8)

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2. (a) Describe the principle and application of flame emission spectroscopy. (6)

(b) UV spectra arises from the absorption and emission by electronic transition. Explain this phenomenon with examples. (9)

II. Short notes : (10 × 5 = 50)

1. Describe the instrumental features and applications of LCMS.

2. Briefly explain the principle and instrumentation of capillary electrophoresis.

3. Explain the structural features affecting the fluorescent intensity. Why fluorimeter is more sensitive and selective than absorption spectra?

4. Explain how X-ray diffraction methods can be used for quantitative analysis.

5. What is derivative spectroscopy? Explain its application with one example.

6. Give an account of various techniques available for carrying out the thermal analysis. Give the working of any one instrument.

7. Describe the limitations and strengths of GLC.

8. How will you differentiate the following compounds by NMR and Mass spectroscopy?

(a) $\text{OH}-\text{CH}_2-\text{CH}_2-\text{OH}$

(b) $\text{CH}_3-\text{CH}(\text{OH})-\text{CH}_2-\text{OH}$.

9. Explain the construction and working principle of Time of Flight mass analyzer.

10. Discuss briefly the principle and instrumentation of HPTLC.

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First Year

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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. (a) Write the applications of thermogravimetric analysis, quoting suitable examples.

(b) Write a note on Radio immune assays.
(10 + 10 = 20)

2. Give a detailed account of principle, types of ion exchangers and chemistry involved with application of ion-exchange process in pharmaceutical analysis. Explain the factors that determine the distribution of ions between an ion-exchange resin and a solution. (15)

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3. With reference to atomic, electronic and molecular factors, describe the theory underlying the following analytical techniques :

- (a) Infra-red spectrometry
- (b) NMR spectrometry
- (c) Fluorimetry. (15)

II. Short notes : (6 × 5 = 30)

1. With a neat sketch, explain the working of a Barrier Layer Cell (BLC). Compare the sensitivity and application of BLC with the other detectors used in the detection of visible radiations.

2. Establish a mathematical relationship between concentration of fluorogenic substance and intensity of fluorescence. Give any two examples of a fluorogenic substance.

3. What is a base peak, M+1 peak, M+2 peak, parent ion peak and metastable ion peak in a mass spectrum? With the help of a suitable molecular structure show the formation of such peaks by fragmentation or such other process.

4. What are the different components of an atomic absorption spectrometer? What are their roles in the equipment?

5. What are bonded phase supports? List their advantages and applications in liquid chromatography.

6. What is chemical shift in NMR spectroscopy? Describe the various factors causing chemical shift with suitable examples.