

NKT/KS/17/6584

B.Pharm (Eight Semester) (C.B.S.) Examination**PHARMACEUTICAL ANALYSIS—IV****(Spectroscopy)****Paper—3**

Time : Three Hours]

[Maximum Marks : 80

N.B. :— (1) Question No. 1 is compulsory.(2) Solve any **four** questions from the remaining.

(3) Draw neat labeled diagram wherever necessary.

(4) Assume suitable data wherever necessary.

1. Attempt any **five** of the following : 4×5
 - (a) Explain how intermolecular and intramolecular hydrogen bonding is differentiated by IR-Spectrophotometry.
 - (b) Explain why, quantitative measurements are mostly done at λ_{\max} in UV-Vis spectrophotometry.
 - (c) What are isotope peaks in mass spectrum ? Give their significance.
 - (d) Compare and contrast atomic absorption spectrophotometry and flame photometry.
 - (e) Explain the significance of number of peaks and their intensity in structure elucidation of organic compound by PMR spectrometry.
 - (f) Compare dispersion-IR and FT-IR techniques with respect to instrumentation and resolution power.
 - (g) Explain the principle of difference and derivative spectrophotometry.
2. (a) Explain energy transitions in UV-Visible region of EMR and describe the effect of solvent polarity on them. What do you understand by chromophores and auxochromes ? Explain giving suitable examples. 8
 - (b) Explain Beer-Lambert's law and derive mathematical expression for it. How will you experimentally verify it ? Give reasons for deviation from the law. 7
3. (a) Explain the origin of vibrational-rotational spectra giving various modes of molecular vibrations. Describe construction and working of typical double beam IR-Spectrophotometer and give its applications in pharmaceutical quality control. 10
 - (b) Describe sample handling and sample cells in IR-Spectrophotometry. 5

4. (a) Describe the theory of NMR spectroscopy and explain construction and working of NMR spectrometer. 8
- (b) What is chemical shift ? How it is measured ? Give factors influencing chemical shift. 7
5. (a) Give basic principle of mass spectrometry and describe construction and working principle of double focussing mass-spectrometer. 8
- (b) Describe general rules of fragmentation on electron impact. 7
6. (a) Describe the construction and working of atomic absorption spectrophotometer and elaborate on techniques of conversion of sample into atoms. Give applications of AAS in pharmaceutical analysis. 10
- (b) Write a note on detectors used in UV-visible spectrophotometers. 5
7. Write short notes on any **three** of the following : 5×3
- (a) Spin-spin coupling and decoupling
- (b) CIMS
- (c) GC-MS
- (d) Simultaneous determination of binary mixture by UV-visible spectrophotometry.
- (e) Monochromators.

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