

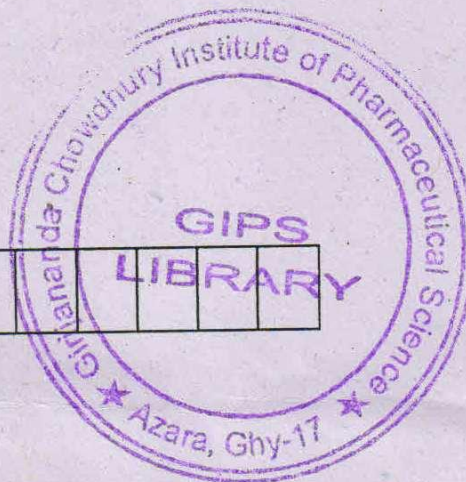
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2017

B.Pharm 7th Semester End-Term Examination

PHARMACEUTICAL ANALYSIS – III

Full Marks – 100

Time – Three hours

The figures in the margin indicate full marks for the questions.

Answer Question No. 1 and any *Six* from the rest.

1. Answer *all* questions : (10 × 1 = 10)

(a) In infrared spectroscopy which frequency range is known as the fingerprint region?

(i) 400 – 1400 cm⁻¹

(ii) 1400 – 900 cm⁻¹

(iii) 900 – 600 cm⁻¹

(iv) 600 – 250 cm⁻¹

(b) A strong signal at 1700 cm⁻¹ in an IR spectrum indicates the presence of a(n)

(i) Alcohol

(ii) Ether

(iii) Carbonyl

(iv) Amine

[Turn over

- (c) Red shift is a
- (i) Shifting of λ_{max} to a shorter wavelength
 - (ii) Shifting of λ_{max} to a longer wavelength
 - (iii) Increase in intensity of absorbance
 - (iv) Decrease in the intensity of absorbance
- (d) The Beer-Lambert Law...
- (i) Relates absorbance, concentration, path length and molar absorption coefficient
 - (ii) Tells us the volume of the sample
 - (iii) Relates frequency and wavelength
 - (iv) Allows us to calculate how conjugated the system is
- (e) Fluorescence property of a molecule increases by the presence of
- (i) $-\text{COOH}$
 - (ii) $-\text{NH}_2$
 - (iii) $-\text{NO}_2$
 - (iv) $-\text{N}=\text{N}-$
- (f) In mass spectra the most intense peak is the
- (i) Base peak
 - (ii) Fragment peak
 - (iii) Molecular ion peak
 - (iv) None of the above

- (g) The No of H^1 NMR signal in iso-butane is
- (i) 1
 - (ii) 2
 - (iii) 3
 - (iv) 4
- (h) Isocratic elution in HPLC is one in which the composition of the solvent
- (i) Remains constant
 - (ii) Changes continuously
 - (iii) Changes in a series of steps
 - (iv) All of the above
- (i) Which of the following is not used as a detector in GC?
- (i) IR spectroscopy
 - (ii) Flame ionisation
 - (iii) NMR
 - (iv) Electrical conductivity
- (j) In fluorimetry, the emission radiation is always
- (i) Equal to excitation radiation
 - (ii) More energetic than the excitation radiation
 - (iii) Of a shorter wavelength than the excitation radiation
 - (iv) Of a longer wavelength than the excitation radiation

2. Define Beer-Lambert law. Mention the effect of solvent and conjugation on UV absorbance. Mention the different types of shift that occurs in UV spectroscopy. Give an account on different types of electronic transition that occurs in UV spectroscopy.

(2+4+4+5=15)

3. What is the difference between fluorescence and phosphorescence? With Jablonski diagram explain the theory of fluorescence and phosphorescence. Explain the different factors affecting fluorescence. (2+5+8=15)
4. What are the different types of vibration that occurs in IR spectroscopy? Write the different factors affecting IR absorption. With a neat diagram explain the instrumentation of FITR spectrophotometer. (5+4+6=15)
5. What is the basic principle of flame photometry? Write the effect of solvent on flame photometry. With a neat diagram explain the working of a total consumption burner. Explain the different interferences in flame photometry. (2+3+5+5=15)
6. Discuss the principle and instrumentation of NMR spectroscopy. Why TMS is used as a reference in NMR spectroscopy? Define chemical shift and discuss the factors affecting chemical shift. (8+2+5=15)
7. Discuss the principle and instrumentation of mass spectrometry. What is time of flight? Explain the different types of ions formed in mass spectrometry. (7+2+6= 15)
8. What is the principle of HPLC? With neat diagram explain the instrumentation of HPLC? What is HETP? Write down some applications of HPLC. (2+7+2+4=15)
9. Write note on (3 × 5 = 15)
- (a) Radio immunoassay
 - (b) X-ray Diffraction
 - (c) Atomic absorption spectroscopy.