



Name : .....

Roll No. : .....

Invigilator's Signature : .....

**CS/B.Pharm/SEPARATE SUPPLE/SEM-8/PT-801/2011**

**2011**

**PHARMACEUTICAL ANALYSIS**

Time Allotted : 3 Hours

Full Marks : 70

*The figures in the margin indicate full marks.*

*Candidates are required to give their answers in their own words as far as practicable.*

**GROUP – A**

**( Multiple Choice Type Questions )**

1. Choose the correct alternatives for the following :

10 × 1 = 10

- i) Which of the following transitions is the highest energy transition ?
  - a)  $n$  to  $\sigma^*$
  - b)  $n$  to  $\pi^*$
  - c)  $\pi$  to  $\pi^*$
  - d)  $\sigma$  to  $\sigma^*$
  
- ii) How do you turn a signal recorded in the time domain into a frequency domain signal ?
  - a) Fourier transformation
  - b) Measurement of peak areas
  - c) By use of Michelson interferometer.

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- iii) Which of the following fundamental molecular vibration does alter a bond angle ?
- a) Antisymmetrical stretching
  - b) Scissoring
  - c) Rocking
  - d) Wagging.
- iv) Due to coupling with  $n$  adjacent non-equivalent protons, number of lines in coupling pattern is equal to
- a)  $n$
  - b)  $n - 1$
  - c)  $n - 2$
  - d)  $n + 1$ .
- v) Which of the following analytical procedure does not directly employ electromagnetic spectrum ?
- a) UV-VIS spectroscopy
  - b) Mass spectrometry
  - c) NMR spectroscopy
  - d) Raman spectroscopy.
- vi) When radiation energy is absorbed by a spin  $\frac{1}{2}$  nucleus in a magnetic field, what happens ?
- a) The precessional frequency of the nucleus increases
  - b) The nucleus spins faster
  - c) Angle of precession flips so that the magnetic moment of nucleus opposes the field
  - d) none of these.



- vii) Chemical shift parameter is used in
- a) NMR spectroscopy      b) Mass Spectrometry  
c) IR spectroscopy      d) All of these.
- viii) Which of the following compounds is most likely to have its base peak at  $m/z = M-43$  ?
- a) Alkenes      b) Cycloalkanes  
c) Alcohols      d) Alkyl iodides.
- ix) Retention factor ( $R_f$ ) in chromatography is used for
- a) quantitative purpose      b) qualitative purpose  
c) preparative purpose      d) none of these.
- x) As solvent polarity is increased  $\pi$  to  $\pi^*$  transitions undergo
- a) bathochromic shift      b) hypsochromic shift  
c) hyperchromic shift      d) both (a) & (c).

**GROUP – B**

**( Short Answer Type Questions )**

Write short notes on any *three* of the following.

3  $\times$  5 = 15

2. Deviation of Beer's law.
3. Identification of functional groups by IR spectroscopy.
4. Flame photometry
5. a) Bathochromic shift  
b) Hypsochromic shift.
6. Positive and negative quenching.



**GROUP – C**

**( Long Answer Type Questions )**

Answer any *three* of the following.  $3 \times 15 = 45$

7. a) Write an account of the principles and applications of IR spectroscopy.  $7\frac{1}{2}$
- b) Write an account of the principles of fluorimetry and its applications.  $7\frac{1}{2}$
8. a) Explain the various transition states of electrons involved in UV-VIS spectroscopy. 6
- b) Derive the formula for Beer-Lambert's law. 5
- c) Give a neat sketch of double beam spectrophotometer. 4
9. a) Write an account of the factors influencing fluorimetry. 5
- b) Write an account of the principles of NMR spectroscopy with neat diagram. 5
- c) Write down the applications of NMR spectroscopy. 5
10. Write short notes on any three of the following :  $3 \times 5$
- a) Total Quality Management ( TQM )
- b) Factors affecting UV-VIS spectra
- c) Radio immuno assay (RIA)
- d) Spin Spin coupling in NMR
- e) Factors affecting fluorescence.
11. a) Write the differences between fluorescence and phosphorescence. 6
- b) Describe the different types of detectors used in fluorimeter. 9