



Name :

Roll No. :

Invigilator's Signature :

CS/B.PHARM (NEW)/SEM-8/PT-801/2012

2012

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 any *ten* of the following :

10 × 1 = 10

i) In Atomic Absorption Spectroscopy the Hollow Cathode lamp window can be constructed with

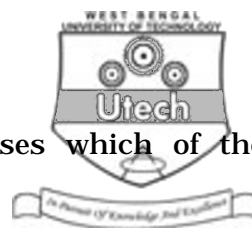
- | | |
|-----------|------------------|
| a) Quartz | b) Silica |
| c) Glass | d) all of these. |

ii) Phosphate enzyme is used as an indicator in

- | | |
|----------|------------------------|
| a) RIA | b) ELIA |
| c) ELISA | d) Fluoroimmuno assay. |

8397

[Turn over



iii) Alkyl substitution in an alkene causes which of the following effects ?

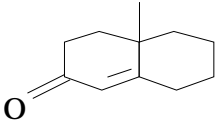
- a) Hypochromic b) Hyperchromic
c) Bathochromic d) Hypsochromic.

iv) The element used as an ionization suppressor is

- a) Bi b) Cs
c) Na d) Mg.

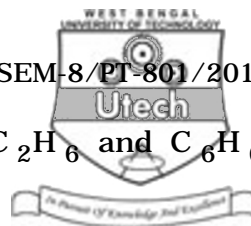
v) If a large atomic number is introduced into a π electron system, it enhances

- a) Phosphorescence
b) Fluorescence
c) Dissociation
d) Rigidity.

vi) λ_{max} of  calculated by Woodward-

Fiesher rule is

- a) 231 nm b) 244 nm
c) 251 nm d) 275 nm.



vii) The PMR spectra of H_2 , CH_4 , C_2H_6 and C_6H_6 exhibit

- | | |
|------------|---------------|
| a) Singlet | b) Doublet |
| c) Triplet | d) Multiplet. |

viii) If the wave number is 2500 cm^{-1} , then what will be the λ_{max} value ?

- | | |
|--------------------|-----------------------|
| a) $4 \mu\text{m}$ | b) $5 \mu\text{m}$ |
| c) $8 \mu\text{m}$ | d) $10 \mu\text{m}$. |

ix) Vibration region of IR ranges from

- | | |
|-------------------------|---------------------|
| a) visible to 1.2μ | b) $1.2 - 2.5 \mu$ |
| c) $2.5 - 25 \mu$ | d) $25 - 400 \mu$. |

x) Solid samples for running IR spectrum through Nujol Mull Technique should be used in combination with

- | |
|--------------------------|
| a) Hepatochlorobutadiene |
| b) Hexachlorobutadiene |
| c) Pentachlorobutadiene |
| d) Tetrachlorobutadiene. |



- xi) By which of the following methods can Riboflavin be assayed ?
- a) NMR
 - b) IR spectroscopy
 - c) Fluorimetry
 - d) UV-spectrophotometry.
- xii) Telsa is a unit of
- a) Chemical shift
 - b) Precissional frequency
 - c) Resonance
 - d) Magnetic flux density.

GROUP - B

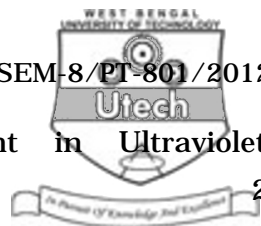
(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

2. What is allowed and Forbidden transition ?

Prove that $\epsilon = \frac{A (1\%, 1 \text{ cm }) \times \text{Molecular wt}}{10}$. $2 + 3$

3. What are the limitations of Flame Photometry ? What are the factors that influence the intensity of emitted radiation in a flame photometry ? $2 + 3$



4. a) Why is Ethanol a good solvent in Ultraviolet Spectroscopy ? 2
- b) Define the following terms : 3 × 1
- i) Absorbance
 - ii) Transmittance
 - iii) Fluorescence.
5. After absorbing infrared radiation the nuclei of a diatomic molecule vibrates according to simple harmonic motion. Justify the statement mathematically.
6. Define the following : 5 × 1
- i) Chromophore
 - ii) Auxochrome
 - iii) Hyperchromic effect
 - iv) Chromogen
 - v) Isobestic point.

GROUP - C

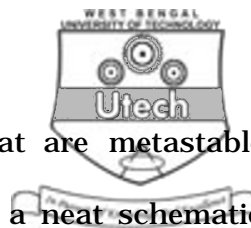
(Long Answer Type Questions)

Answer any *three* of the following. 3 × 15 = 45

7. What is the difference between emission spectroscopy and absorption spectroscopy ? Write down the operating principle of atomic absorption spectroscopy. Give a neat schematic diagram explaining the instrumentation of an atomic absorption spectrometer. How non metals are estimated using atomic absorption spectrometry.

2 + 4 + 6 + 3

CS/B.PHARM (NEW)/SEM-8/PT-801/2012



8. Define parent peak and base peak. What are metastable ions and what is their significance? Give a neat schematic diagram of a mass spectrometer explaining its different components. Write a brief note on Quadropole mass spectrometer. What are the hyphenated techniques employed in mass spectroscopy? 2 + 2 + 6 + 3 + 2

9. a) How many fundamental modes of vibration would you predict for (i) Benzene and (ii) Toluene? 2

b) Why water can't be used as a solvent for Infrared spectroscopy? 2

c) Write a short note on the following: 4 × 2

i) Finger Print Region

ii) Overtone Region

iii) Stretching

iv) Bending Vibration.

d) What are the disadvantages of sample preparation by Pressed Pellet technique in IR spectroscopy? 3

8397

6



10. Elaborate about the Chemical Shift in NMR. Write briefly on Spin Spin coupling and splitting of signals in NMR. What is coupling constant ? The molecular formula of an organic compound is C_4H_8O . It gives characteristics band between the frequency of $1680 - 1760\text{ cm}^{-1}$ in IR spectra. In NMR three signals appear at (i) $7.52\text{ }\tau$ quartlet, (ii) $7.88\text{ }\tau$ singlet, (iii) $8.93\text{ }\tau$ triplet. Determine the structural formula of the compound. 5 + 5 + 1 + 4

11. a) Write down the Principle of Radio Immuno Assay. 3
- b) What are applications of Radio Immuno Assay ? 5
- c) What do you mean by single beam and double beam spectrophotometer ? Describe double beam spectrophotometer with a neat diagram. 7

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