Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/B.PHARM/SEM-8/PT-801/2010

2010

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 : $10 \times 1 = 10$

i) Bathochromic shift is also known as

a) Blue Shift b) Red Shift

c) Green Shift d) Yellow Shift.

ii) Finger Print Region is characteristic of organic compound. It is

a) 3000 - 1400 cm^{-1} b) 1400 – 666 cm^{-1}

c) 2100 – 1600 cm^{-1} d) 2800 – 1400 cm^{-1} .

iii) Which of the following bonds would show the strongest absorption in the IR ?

a) Oxygen-hydrogen b) Carbon-hydrogen

c) Hydrogen-sulfur d) Nitrogen-hydrogen.

iv) Chemical shift in NMR spectroscopy is expressed in

a) micrometre b) parts per million

c) centimetre d) nanometre.

v) Isopropyl chloride has

a) 1-PMR signal b) 2–PMR signal

c) 3–PMR signal d) No signal.

vi) Relative height of the parent peak of sulphide is

a) more than that of ketone

b) less than that of ketone

c) same as ketone

d) relatively same as ketone.

vii) Which of the following fundamental molecular vibration does alter a bond angle ?

a) Antisymmetrical stretching

b) Scissoring

c) Rocking

d) Wagging.

viii) The relationship between the mass per unit charge (m/e) and the radius (r) of the circular path made by the molecular ion when placed in magnetic field is

a) $m/e \propto r$ b) $m/e \propto_1 /r$

c) $m/e \propto r^2$ d) $m/e = r$.

ix) FT–IR instrument record a signal in the

a) time domain

b) frequency domain

c) both time & frequency domains.

x) Which of the following compounds is most likely to have its base peak at m/z = 43 ?

a) $CH_3 (CH_3)_4 CH_3$

b) $(CH_3)_3 CCH_2 CH_3$

c) Cyclohexane

d) $(CH_3)_2 CHCH_2 (CH_3)_2$.

xi) By which of the following methods Riboflavin can be assayed ?

a) UV spectroscopy b) IR spectroscopy

c) Fluorimetry d) Visible spectroscopy.

xii) In the equation $A = \varepsilon bc$, what quantity is represented by ε ?

a) Absorptivity b) Molar absorptivity

c) Path length d) None of these.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. 3 × 5 = 15

2. Write down the applications of Radioimmunoassay.
3. What are the principles of emmission spectroscopy and absorption spectroscopy ?
4. Discuss different factors affecting fluorescence intensity. How will you establish the relation between concentration and fluroscence intensity of any compound ? 3 + 2
5. What are the general features of TQM ?
6. Define chromophores and auxochrome. Explain what are the reasons for bathochromic and hypsochromic shift.

GROUP – C

(Long Answer Type Questions)

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

7. Illustrate different fundamental vibrations in IR spectroscopy. Discuss interfermetric wavelength selection and thus explain the operational advantages of an FTIR. What is Hooke's Law and how is it utilized to detect functional groups in a molecule ? 5 + 5 + 5

8. a) Describe the different electronic transition involved in UV/Visible Spectrophotometer. 8

   b) Discuss about the detectors used in UV Spectrophotometer. 3

   c) What are the applications of UV Spectrophotometry ? 4

9. a) Describe the principle of NMR Spectroscopy. 5

   b) What is chemical shift ? 3

   c) Describe Spin Spin Coupling. 5

   d) Which units of the δ scale and ν scale are used in expressing chemical shift ? What is their relationship ? 2

10. a) What is the theoretical principle of Mass Spectroscopy ? 6

    b) Briefly describe the different parts of Mass Spectrometer with schematic diagram. 6

    c) Mention different applications of Mass Spectrometer. 3

10. Discuss how you will estimate riboflavin using a photo-fluorometer. Explain the operating principle of Flame Photometer. 8 + 7