CS/B.PHARM/SEP.SUPPLE/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)
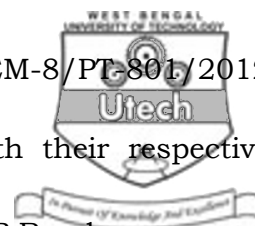
1. Choose the correct alternatives for any *ten* of the following :

$10 \times 1 = 10$

   i)   Alcohols exhibit a strong and broad band in the region
        of $1200 - 1000$ cm^{-1} due to

        a)   O — H stretching   b)   C — H stretching

        c)   C — C stretching   d)   C — O stretching.

   ii) Which of the following fundamental molecular
        vibrations alters bond length ?

        a)   Symmetrical stretching   b)   Scissoring

        c)   Rocking   d)   Wagging.

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iii) 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) $n + 1$.

iv) Lattice mirror is used in

    a)   Fluorimetry   b)   Flame Photometry

    c)   AAS   d)   Visible Spectroscopy.

v) Which of the following compounds will have fractional magnetic moment ?

    a) $^{1}H_{1}$ b) $^{12}C_{6}$

    c) $^{16}O_{8}$ d) $^{32}S_{16}$.

vi) FTIR records a signal in the

    a)   Time domain

    b)   Frequency domain

    c)   both Time and Frequency domain.

vii) Which of the following detectors is used in UV Spectroscopy ?

    a)   Photovoltaic cell detector

    b)   Photoemissive cell detector

    c)   Photodiode array detector

    d)   None of these.

viii) Base peak of 1-phenyl ethanol appears at m/z

    a)   83   b)   91

    c)   108   d)   51.

ix) The value of Chemical Shift is expressed as

    a)   Å   b) cm^{-1}

    c)   ppm   d)   nm.

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x) Match the following compounds with their respective absorption bands P to S :

1.	1, 3 - butadiene	P)	R-Band
2.	Acrolein	Q)	B-Band
3.	Benzene	R)	E-Band
4.	Naphthalene	S)	K-Band

   a)   1-S, 2-P, 3-Q, 4-R   b)   1-P, 2-S, 3-Q, 4-R

   c)   1-R, 2-P, 3-S, 4-Q   d)   1-P, 2-S, 3-Q, 4-R.

xi) The relationship between the mass per unit charge (m/e) and the radius 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) $m/e \propto 1/r^2$.

xii) Absorption maxima of benzene changes from 255 nm to 280 nm, when the auxochrome .... is added to benzene ring.

   a) $-NHCH_3$ b) $-OH$

   c) $-OCH_3$ d) $-NH_2$.

GROUP – B

(Short Answer Type Questions)

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

2. How do you determine the concentration of an unknown sample by the application of Beer's and Lambert's Law ?

3. State the operational procedure of a photofluorimeter.

4. How many fundamental vibrations are expected for CO_2 and H_2O ? State the procedure for preparation of solid samples in IF spectroscopy.

5. Define chromophores and auxochromes ? Explain why auxochrome increases the colouring power of chromophores.

6. Write down the principle and applications of Radio-Immuno-Assay.

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GROUP – C

(Long Answer Type Questions)

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

7. What is the principle of NMR ? What is Precessional frequency ? Prove that Precessional frequency is proportional to the strength of the applied field. Why is TMS chosen as the reference standard ? Explain Spin-Spin Splitting with suitable example. What is Coupling Constant ?

3 + 2 + 3 + 3 + 3 + 1

8. a) What are the different types of vibrations that cause IR radiation ?

   b) What are different IR sources commonly used ?

   c) Write the Michelson Interference mechanism in FTIR Instrumentation. 5 + 5 + 5

9. a) What do you mean by flame emission spectroscopy ? Write the basic principles of flame photometry.

   b) Write the instrumentation and working of a Flame photometer.

   c) How do you determine the sodium content of a unknown sample using flame photometer ? 5 + 5 + 5

10. a) What do you mean by single beam and double beam spectrophotometer ? Describe with neat diagram a double beam spectrophotometer.

    b) What are the sources used in UV spectrophotometer ? Describe in detail on photomultiplier tubes. 7 + 8

11. Write short notes on any *three* of the following : 3 × 5 = 15

    a) TQM

    b) ISO-9000

    c) Basic concept of mass-spectroscopy

    d) Fluorescence and phosphorescence.

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