

Total No. of printed pages = 3

BP 811 ET

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2023

B. Pharm 8th Semester End-Term Examination

ADVANCED INSTRUMENTAL TECHNIQUES – THEORY

(New Regulation – w.e.f 2017-18)

Full Marks – 75

Time – Three hours

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

GROUP – A

1. Answer the following (MCQ): (20 × 1 = 20)
- (i) The distance between the centers of the two adjacent peaks in a multiplet is usually constant and is called the
- (a) frequency constant (b) coupling space
(c) coupling distance (d) coupling constant
- (ii) This difference in the absorption position of the proton with respect to TMS signal is called
- (a) physical shift (b) resonance shift
(c) chemical shift (d) shielding shift
- (iii) Mass spectrophotometer separate the ions on the basis of which of the following?
- (a) Mass to charge ratio (b) Mass
(c) Atomic weight (d) Molecular formula.
- (iv) Reference materials which are commonly employed as internal standard is
- (a) TMS (b) TBS
(c) MTS (d) CDS

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- (v) NMR spectra of Benzene gives _____ signals.
- (a) One (b) Two
(c) Three (d) Four
- (vi) Chemical Shift is measured in term of
- (a) alpha value (b) Beta value
(c) Gamma value (d) delta value
- (vii) The highest m/z peak in the mass spectrum is called as
- (a) Parent peak (b) Isotopic peak
(c) Fragment peak (d) Base peak
- (viii) ICH guideline used for analytical method validation is
- (a) Q2 (b) Q7
(c) Q8 (d) Q10
- (ix) TGA curve is a plot of
- (a) Weight vs temperature (b) Weight vs volume of titrant
(c) Weight vs current (d) Weight loss vs temperature
- (x) In reverse phase chromatography, the stationary phase is made of
- (a) Non-polar (b) Polar
(c) Either non-polar or polar (d) None of these.
- (xi) The column efficiency increases with decrease in
- (a) HETP (b) Particle size
(c) Column length (d) Stationary phase
- (xii) In DTA, plot is created between
- (a) ΔT vs Temperature (b) Time vs Temperature
(c) Energy vs Time (d) ΔT vs Time
- (xiii) The principle of column chromatography is based on
- (a) Adsorption (b) Absorption
(c) Partition (d) Fraction

(xiv) The volatile oil is analyzed by

- (a) HPLC (b) GC
(c) TGA (d) DSC

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(xv) The stationary phase of RP-HPLC is

- (a) Non-Polar (b) Polar
(c) Both (d) None

(xvi) The solvent used in NMR spectroscopy is

- (a) Carbon tetrachloride (b) Carbon dioxide
(c) Methanol (d) Ethanol

(xvii) The number of signals in an nmr spectrum tells the number of the _____ in a molecule.

- (a) sets of protons (b) sets of equal protons
(c) sets of equivalent protons (d) sets of electrons.

(xviii) Paper chromatography is used for the

- (a) Separation (b) Partition
(c) Retention (d) Identification

(xix) Patent ion peak give information about

- (a) Molecular weight (b) Equivalent weight
(c) Atomic weight (d) Atomic structure

(xx) Which of the following cannot be utilized as an adsorbent in column adsorption chromatography?

- (a) Magnesium oxide (b) Silica gel
(c) Activated alumina (d) Potassium permanganate

GROUP - B

(Short Answer questions)

2. Answer any seven questions

(7 × 5 = 35)

- (a) Write the Principles and applications of thermo-gravimetric Analysis (TGA)
(b) Explain the Electron impact Ionization techniques in mass spectroscopy.

- (c) Define validation. Enlist the different parameters used in method validation.
- (d) Write a note on calibration of UV-Visible spectrophotometer.
- (e) Write the application of Hyphenated techniques in pharmaceutical industry.
- (f) Discuss the principle of X-ray crystallography and its application.
- (g) Write a short note on radio-immune assay (RIA)
- (h) Write General principle and procedure involved in the solid phase extraction
- (i) Discuss the factor affecting in chemical shift in NMR

GROUP – C

(Long Answer questions)

3. Answer any *two* of the following. (2 × 10 = 20)
- (a) Write the principle and instrumentation and application of Mass spectrophotometer.
 - (b) Define Calibration. Discuss the calibration of High performance liquid chromatography.
 - (c) Write the principle, Instrumentation and application of NMR spectrophotometer.
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