

UKA TARSADIA UNIVERSITY

040030101/040040101/040050101/040060101/040120101 - Modern Analytical Techniques
(THEORY) at the M.Pharm. (QA) / M.Pharm. (Pharmaceutics) / M.Pharm. (Pharmacology) /
M.Pharm. (PA)/ M.Pharm. (PT) of Semester 1

Subject: Modern Analytical Techniques

Time : 2.30 pm to 5.30 pm

Duration: 3 Hours

Date : 17/05/2014

Max. Marks: 70

Instructions:

1. Attempt all questions.
2. Write each section in a separate answer book.
3. Make suitable assumptions wherever necessary.
4. Figures to the right indicate full marks.
5. Draw diagrams/figures whenever necessary.

SECTION -1

- Q.1a.** Explain the following statements (**Any Four**) (08)
- i. Anilinium cation exhibits UV spectrum almost identical to benzene
 - ii. Mono substituted alkyl benzene shows prominent peak at 91 in MS
 - iii. R band shows a blue shift on increasing the polarity of the solvent
 - iv. On hydrogen bonding stretching frequency in IR gets lowered.
 - v. Carbon-13-NMR spectrum are much more difficult to record than PMR.
 - vi. Nonlinear calibration curve is obtained with ordinary spectrometer in AAS.
- b.** How will you differentiate three isomers of trichloro benzene on the basis of their proton decoupled CMR spectra? (03)

- Q.2 a.** Explain the basic principle of atomic spectroscopy. Discuss atomization techniques used in atomic absorption spectroscopy. (06)

OR

- a.** Enumerate various type of mass analyser. Discuss Time of Flight analyser with suitable diagram. (06)
- b.** How can you differentiate the isomer of pentanol using mass spectroscopy? (03)
- c.** How will you differentiate following pair of compounds using IR spectroscopy? (03)
- Give approximate wave number for prominent peaks.
- i. Ortho and Para hydroxy benzoic acid
 - ii. Acetylene and Ethylene
 - iii. Acetaldehyde and ethyl alcohol

- Q. 3** Answer any **TWO** (12)
- a. Describe the factors affecting the chemical shift.
 - b. What is reflection spectroscopy? Describe attenuated total reflection(ATR) spectroscopy with its applications.
 - c. What is Bragg's law? Describe X-rays sources.

SECTION - 2

- Q. 4 a.** Enumerate the factors responsible for the band broadening in chromatographic column. Discuss Eddy and Longitudinal diffusion (06)
- b.** What do you mean by Radio Immuno Assay? Discuss principle and method used in ELISA technique. (05)

Q. 5 a. Discuss principle, instrumentation and application of Differential Scanning Calorimetry (DSC). (06)

OR

a. What is affinity chromatography? Discuss various ligands used in affinity chromatography with its characteristics. (06)

b. Explain: Reference standard, Certified reference material and working standard. (06)
Describe storage and documentation of reference standard.

Q. 6 Write short notes on the following (Any Three) (12)

a. Size exclusion chromatography

b. HPTLC

c. ORD and cotton effect

d. Isoelectric focusing