

**UKA TARSADIA UNIVERSITY**

Maliba Pharmacy College

M. Pharm. 1<sup>st</sup> Semester Internal Examination December 2013**040030101/ 040040101/040050101/040060101- Modern Analytical Techniques**

Time: 10:30 a.m. To 1:30 p.m.

Max. Marks: **70**

Date: 03/12/2013

**Instructions:**

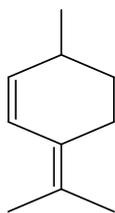
- Attempt any **FIVE** questions.
- Each question carries **14** marks.
- Make suitable assumption whenever necessary.
- Figures to the right indicate full marks.

- Q.1 A. Explain the following statements (**Any Three**) [06]
1. TMS is used as reference compound in NMR.
  2. Electron impact ionization technique is not used to determine the molecular weight of proteins.
  3. Mono substituted alkyl benzene shows prominent peak at 91 in MS.
  4. Carboxylic Acid proton appears at high delta value in proton NMR.
- B. Enumerate the ionization techniques used in MS. Describe chemical ionization technique. [04]
- C. How will you differentiate three isomers of butyl amine with the help of mass fragmentation? Explain with prominent mass peak. [04]
- Q.2 A. Describe factors affecting the chemical shift. [06]
- B. Give chemical shift values and spin coupling for the following compounds. [04]
- |                |                    |
|----------------|--------------------|
| i. Acetic acid | ii. 2- Propanol    |
| ii. Aniline    | iv. Benzyl acetate |
- C. A compound with the molecular formula  $C_7H_7NO_2$  has following PMR data. [04]  
( $\delta$ ): 2.5 s (3H), 7.3 d (2H), 8.1 d (2H)  
Find out the structure of the compound.
- Q.3 A. Classify chromatographic techniques. Discuss the theories of chromatography. [07]
- B. Explain the principle of size exclusion chromatography. State its applications. [07]
- Q.4 A. Explain the following terminologies in Affinity chromatography: Ligand, Spacer arm, Competitive elution, Matrix, Immobilization method. [05]
- B. Discuss the kinetic variables affecting zone broadening. [06]
- C. Explain the principle of flame photometry. [03]
- Q.5 A. Discuss the interferences in atomic spectroscopy and state the remedies for same. [07]
- B. What is the significance of polarity index for mobile phase optimization in Partition chromatography? Explain giving an example how polarity index aid in optimizing capacity factor of an analyte. [07]

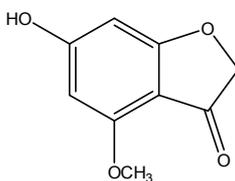
- Q.6 A. Discuss the structural features that may affect the absorption position in UV-Visible spectrum. [06]
- B. Explain the use of derivative spectroscopy in simultaneous estimation of two components in mixture. [04]
- C. Comment on following statement and justify your answer. [04]
1. UV spectrum of aniline in acidic medium is almost identical to that of benzene.
  2. Bathochromic shift is observed for  $\pi \rightarrow \pi^*$  transition, while going from a less polar to a more polar solvent.

- Q.7 A. Predict the  $\lambda_{\max}$  of following compounds. [06]

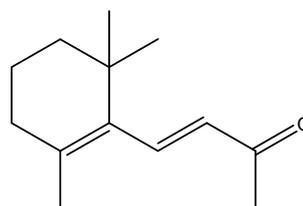
1)



2)



3)



- B. Explain principle of IR absorption spectroscopy. Describe sample handling techniques to record the IR spectrum. [08]

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