

Set-I

BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS: M.Pharm.
BRANCH: PHARMACY

SEMESTER: II
SESSION: SP'2022

TIME: 3.00 Hours

SUBJECT: MPC 201 T-Advanced Spectral Analysis

FULL MARK: 75

INSTRUCTIONS: Answer any five Questions

1. The missing data, if any, may be assumed suitably.
 2. Before attempting the question paper, be sure that you have got the correct question paper.
 3. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
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- 1a. How will you differentiate between Methylcyclohexane and Ethylcyclopentane having the same mass ($M+ 98$)? [7]
- 1b. Enlist the different ionization techniques in Mass spectroscopy and discuss their strengths and limitations [8]
- 2a. "Nuclear Overhauser Effect Spectroscopy is used to determine spatial structure of biomolecules"-Justify [7]
- 2b. What is Chemical Shift? Describe the chemical shifts of a few significant protons along with shielding and de shielding with the help of examples. [8]
- 3a. Discuss the principle of UV spectroscopy & define chromophores and auxochromes with examples. [7]
- 3b. How will you differentiate between primary, secondary and tertiary alcohols with their IR-spectra? [8]
- 4a. Describe the principle of Column and Flash chromatography. Discuss their strengths and limitations. [7]
- 4b. Draw a neat schematic diagram of LC-MS and describe its components with operational mechanism. [8]
- 5a. Enlist the qualitative and quantitative applications of DTA and DSC [7]
- 5b. Differentiate between TLC and HPTLC and enumerate their qualitative and quantitative applications. [8]
- 6a. Highlight the salient features of LC-MS and GC-MS. [7]
- 6b. What are the operational differences between Ion Exchange Chromatography & Ion Exclusion Chromatography? [8]
- 7a. Highlight the importance of Pascal triangle and Double Bond Equivalent. [7]
- 7b. Write short notes on ELISA and RTPCR. [8]

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Set-II

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| 1a. | Define and discuss the applications of Mc Lafferty rearrangement and α & β cleavage | [7] |
| 1b. | Enumerate the different ionization methods employed in Mass spectroscopy and compare FAB-MS with MALDI | [8] |
| 2a. | Discuss the importance and applications of $^1\text{H-NMR}$ and $^2\text{D-NMR}$ spectroscopy. | [7] |
| 2b. | Predict the $^1\text{H-NMR}$ NMR signals of 2,3-Dibromo Propene and n-Propanol. | [8] |
| 3a. | Discuss the principle of UV and IR spectroscopy & the laws governing them. | [7] |
| 3b. | How will you differentiate between primary, secondary and tertiary alcohols with their IR-spectra? | [8] |
| 4a. | Describe the principle of TLC and Column Chromatography. Draw a neat sketch of Column Chromatograph. | [7] |
| 4b. | Draw a neat schematic diagram of GC-MS and describe its components with operational mechanism. | [8] |
| 5a. | Enlist the qualitative and quantitative applications Differential Scanning Calorimetry. | [7] |
| 5b. | What are hyphenated techniques? Discuss one of them in detail. | [8] |
| 6a. | Highlight the salient features of IR and Raman Spectra. | [7] |
| 6b. | What are the operational differences between Ion Exchange Chromatography & Ion Exclusion Chromatography? | [8] |
| 7a. | Write short notes on Pascal triangle and Nitrogen rule | [7] |
| 7b. | Define Immune bioassay and write a note on RTPCR. | [8] |

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