

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

CLASS: M. PHARM.
BRANCH: PHARMACY

SEMESTER : I
SESSION : MO/19

SUBJECT: MPH101T/MPC101T/MPL101T/MQA101T/MPG101T MODERN PHARMACEUTICAL ANALYSIS
TECHNIQUES

TIME: 3 H

FULL MARKS: 75

INSTRUCTIONS:

1. The question paper contains 7 questions each of 15 marks and total 105 marks.
 2. Candidates may attempt any 5 questions maximum of 75 marks.
 3. The missing data, if any, may be assumed suitably.
 4. Before attempting the question paper, be sure that you have got the correct question paper.
 5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
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- Q.1(a) Define UV-Cutoff. Justify the choice of suitable solvents for performing UV-Visible spectroscopy. [7]
Q.1(b) Discuss the instrumentation and applications of fluorescence spectrophotometer. [8]
- Q.2(a) Discuss the Instrumentation, working conditions, factors affecting separation and applications of 2D-Gel electrophoresis. [7]
Q.2(b) Discuss the Rotating crystal technique with suitable diagrams and discuss how it is different from Laue's Method. [8]
- Q.3(a) Discuss principle, instrumentation, advantage and pharmaceutical applications of TGA. [7]
Q.3(b) Differentiate between DSC and DTA. [8]
- Q.4(a) Derive the equation of Bragg's Law and support its significance in X-ray crystallography. [7]
Q.4(b) Differentiate between $^1\text{H-NMR}$ and $^{13}\text{C-NMR}$ spectroscopy with examples. [8]
- Q.5(a) Define & derive the fundamental equation of Mass Spectroscopy. Compare the strengths and limitations of different Mass analyzers. [3+4]
Q.5(b) (i) Enumerate various Ionization techniques in Mass spectroscopy and compare Electron ionization with Chemical, Field Desorption and MALDI. [4+4]
(ii) Predict and draw the recognizable fragment ion peaks in Mass spectra of: 3-methylpentane and n-methylbenzylamine
- Q.6(a) Explain the principle of NMR-spectroscopy and derive its fundamental equation. Predict the NMR signals and corresponding splitting pattern of 1, 2-Dichloro Methane and Tertiary Butyl amine. [3+4]
Q.6(b) (i) Discuss-Chemical Shift and Coupling Constant with suitable NMR spectrum of any organic compound. [4+4]
(ii) Draw a neat sketch of NMR instrument and describe the sample preparation
- Q.7(a) Define Chromatography? Classify the different chromatographic methods based on principle of separation. Compare Paper Chromatography with Thin Layer Chromatography. [1+3+3]
Q.7(b) (i) Differentiate between GC-MS and LC-MS. [4+4]
(ii) Justify the role of HPTLC in drug discovery.