

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

**CLASS: M.PHARM  
BRANCH: PHARMACY**

**SEMESTER: I  
SESSION: MO'2023**

**SUBJECT: MPC101T/ MPH101T/ MPG101T/ MPL101T/ MQA101T - MODERN PHARMACEUTICAL ANALYTICAL  
TECHNIQUES**

**TIME: 3.00 HOURS**

**FULL MARK: 75**

**INSTRUCTIONS:**

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.
  5. Answer any five questions.
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| 1a. State the principle of photoluminescence with Jablonski diagram.                                       | [7] |
| 1b. Describe the factors affecting fluorescence and phosphorescence.                                       | [8] |
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| 2a. Write in detail about the applications of UV-spectroscopy  | [7] |
| 2b. Discuss various electronic transitions occurring in UV-spectroscopy.                                   | [8] |
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| 3a. Define fingerprint region and discuss various fundamental modes of vibrations in IR spectroscopy.      | [7] |
| 3b. Describe the various factors affecting the fundamental modes of vibrations.                            | [8] |
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| 4a. Define--Chemical shifts, Coupling Constant and NMR scales in NMR spectroscopy.                         | [7] |
| 4b. Discuss the principle and instrumentation of Proton-NMR Spectrometer.                                  | [8] |
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| 5a. Draw a neat sketch of Gas chromatograph and describe its different components.                         | [7] |
| 5b. How do you separate the components present in mixture of nucleic acids by Agarose Gel Electrophoresis. | [8] |
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| 6a. Illustrate the working principle of hollow cathode lamp using its schematic diagram.                   | [7] |
| 6b. Describe the instrumentation of HPLC and discuss its qualitative and quantitative applications.        | [8] |
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| 7a. Discuss the principle and fundamental equation of Mass spectroscopy with an example.                   | [7] |
| 7b. Write notes on--MALDI, Nitrogen Rule, Metastable Ions and McLafferty rearrangement.                    | [8] |

::: 21/11/2023 :::