

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

CLASS: M. PHARMACY
BRANCH: PHARMACY

SEMESTER: I
SESSION: MO2025

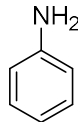
SUBJECT: MPC103T ADVANCED MEDICINAL CHEMISTRY

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.

- | | | | |
|-----|---|-----|-----|
| 1a. | Define a prodrug and provide the characteristics of an ideal prodrug. | CO1 | [7] |
| 1b. | Analyse the analogs-based drug design with examples. | CO4 | [8] |
| 2a. | Detail out the following:
(i) Enantiomerism and pharmacological activity
(ii) Advantages of chiral drugs | CO2 | [7] |
| 2b. | Explain the following:
(i) Stereoslectivity and drug metabolism
(ii) Transformation of a chiral to an achiral centre | CO2 | [8] |
| 3a. | Explain the derivation of the Michaelis-Menten equation. | CO3 | [7] |
| 3b. | Explain the following:
(i) Multisubstrate inhibitors
(ii) Transition state analogs | CO2 | [8] |
| 4a. | Outline the various stages of drug discovery and development. | CO1 | [7] |
| 4b. | (i) Define and explain the various undesirable characteristics of a lead compound.
(ii) Classify various sources of lead compounds with examples. | CO1 | [8] |
| 5a. | Study and identify which of the following molecules act as stronger and weaker hydrogen bond acceptors (HBAs)? Give reasons. | CO5 | [7] |
| | <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> $\begin{array}{c} \text{H} \\ \\ \text{H}_3\text{C}-\text{N}-\text{H} \end{array}$ <p>(1)</p> </div> <div style="text-align: center;"> $\begin{array}{c} \text{H} \\ \\ \text{H}_3\text{C}-\text{N}^+-\text{H} \\ \\ \text{H} \end{array}$ <p>(2)</p> </div> <div style="text-align: center;"> $\begin{array}{c} \text{O} \\ \\ \text{H}_3\text{C}-\text{C}-\text{O}^- \end{array}$ <p>(3)</p> </div> <div style="text-align: center;"> CH_3-F <p>(4)</p> </div> <div style="text-align: center;">  <p>(5)</p> </div> </div> | | |
| 5b. | Define Agonist. Explain the requirements for designing an agonist. | CO3 | [8] |
| 6a. | (i) Briefly explain the different hallmarks of cancer.
(ii) Write the structure and mechanism of action of Gefitinib. | CO4 | [7] |
| 6b. | (i) Write the difference between adjuvant and neoadjuvant cancer therapy.
(ii) Write the example and mechanism of action of a neoadjuvant therapy for the treatment of breast cancer. | CO4 | [8] |
| 7a. | Write the definition, general uses, and classification of NSAIDs with examples. | CO4 | [7] |
| 7b. | (i) Write the advantages of selective COX-2 inhibitors against non-selective NSAIDs.
(ii) Explain how aspirin is useful to a patient suffering from hypertension but could be harmful to an asthmatic patient. | CO4 | [8] |