

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

**CLASS: MPHARM
BRANCH: PHARMACY**

**SEMESTER: 2nd
SESSION: SP2025**

SUBJECT: MPH203T COMPUTER AIDED DRUG DELIVERY SYSTEM

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. Write short notes on (i) MLP (ii) GRNN [7]
- 1b. Discuss the following: [8]
- i. Neuron in ANN
 - ii. Basic Components of ANN
 - iii. Gray Box
 - iv. Black Box
 - v. White Box
 - vi. Constraints
 - vii. Resolution
 - viii. Effect
- 2a. Discuss the importance of AI in biomedical applications [7]
- 2b. Discuss the following terms: [4X2=8]
- i. Independent & Dependent Variable
 - ii. Factor
 - iii. Level
 - iv. Response
- 3a. Discuss the ACAT model for gastrointestinal absorption simulation. [7]
- 3b. Discuss the Importance of Fed Vs. Fasted state in interpreting via Gastroplus software & *Invitro* dissolution with *Invivo-invitro* correlation. [8]
- 4a. Identify the equivalent terms of neural network in statistics: [7]
- i. Statistical term Neural network term
 - ii. Model
 - iii. Independent variables
 - iv. Dependent Variables
 - v. Parameters
 - vi. Estimation
 - vii. Interpolation
- 4b. Explain the concept of optimization in the context of computer-aided pharmaceutical formulation development. What are the key parameters involved in optimization, and how are they practically applied in formulation design? [8]
- 5a. Discuss the historical development in computer aided drug development in detail. [7]
- 5b. Discuss the quality by design and its significance in optimization of various pharmaceutical experiments [8]
- 6a. "ANOVA is a useful tool to discuss the variation in samples and also to determine the suitability of the model". Justify the statement. [7]
- 6b. Discuss the significance of Q8 guidelines in pharmaceutical product development. [8]
- 7a. Explain the ethical and legal aspects that should be considered when utilizing computer applications in pharmaceutical research and development as well as market analysis. [7]
- 7b. Describe how computer-aided tools are used in the development of pharmaceutical emulsions and microemulsion drug carriers. [8]