26.10.2026

Comprehensive Written Test Examination

(For PhD scholars admitted to CoEAI / CITRA)

Ref: Revised Guidelines for Comprehensive Examination issued by Dean Academic dated 15-01-2025 on Rule R14 of the PhD Ordinances & Regulations (2022-23 onwards)

Total Marks: **100**

Core Subject Area: **Machine Learning Basics**

Weight: **40%**

Syllabus:

Linear regression, error functions, and gradient descent optimization; logistic regression; model evaluation metrics including precision, recall, F1-score, ROC curve; micro-averaged and macro-averaged F1-scores for multiclass classification; overfitting and underfitting; decision tree classifiers including splitting criteria; random forest classifiers; neural network classifiers; K-means clustering algorithm; and statistical analysis using the Friedman test for comparing the performance of multiple machine learning algorithms.

Optional Subject Areas:

Broadly based on the course work (say two courses, excluding mandatory ones) of the scholar. This is to be approved by the supervisor and the Ph.D. coordinator.

Weight: **60%** (say, two subject areas each with 30% weight)

Chairperson
CoE-AI
NIT Calicut