Title Page (i)

Title: ATTENDRO: Smart Biometric + App-Based Attendance Management System using AI & IoT

Candidate: _____

Diploma (Department): Applied AI & ML

Institute: Rajarambapu Institute of Technology, Islampur

Academic Year: 2025–2026

Guide: _____

Date of Submission: _____

Certificate of the Guide (ii)

This is to certify that the project titled **"ATTENDRO: Smart Biometric + App-Based Attendance Management System using AI & IoT"** has been carried out by **[Student Name]** under my guidance and supervision in partial fulfillment of the requirements for the award of the Diploma in **Applied AI & ML** at **Rajarambapu Institute of Technology, Islampur**, during the academic year **2025–2026**.

Guide Signature: _____ Date: _____

HOD Signature: _____ Principal Signature: _____

Acknowledgement (iii)

I express sincere gratitude to **[Guide Name]** for guidance and feedback, to the **Department of Applied AI & ML** for providing laboratory resources, to my group members for their dedicated collaboration, and to my parents for their unwavering support throughout this project.

Index / Table of Contents (iv)

Abstract (v)

This project presents **Attendro**, an intelligent, portable, and offline-first biometric attendance system designed for educational institutes. Addressing the limitations of fixed biometric terminals and proxy-prone manual registers, Attendro introduces a **session-controlled** architecture where attendance can only be marked during active, authorized lecture sessions. The system integrates an **ESP32-based portable device** with a fingerprint sensor, a **Supabase (Cloud)** backend for real-time synchronization, and a **Faculty Web App** for session management.

Key innovations include **Time-Variant Batch Locking** (ensuring students only mark attendance for their specific batch), **Offline-First Synchronization** (queueing scans when Wi-Fi is unavailable), and **Context-Aware AI Rules** that validate scans against subject, class, and schedule constraints locally. This system satisfies AIML diploma requirements by leveraging biometric pattern recognition and rule-based decision intelligence to ensure data integrity and operational efficiency.

List of Figures (vi)