A REPORT
ON

AGRIBOT: A GENERATIVE AI-POWERED MULTILINGUAL SYSTEM FOR SUSTAINABLE FERTILIZER RECOMMENDATIONS

Submitted by,

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Under the guidance of,

Dr. Joseph Michael Jerard V

in partial fulfillment for the award of the degree of

BACHELOR OF TECHNOLOGY

IN

COMPUTER SCIENCE AND ENGINEERING

At

GAIN MORE KNOWLEDGE
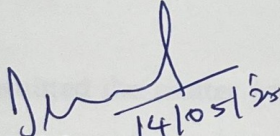REACH GREATER HEIGHTS

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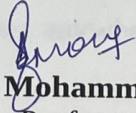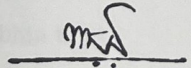
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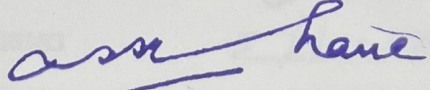**MAY 2025**

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CERTIFICATE

This is to certify that the Internship/Project report **"AgriBot: A Generative AI-Powered Multilingual System for Sustainable Fertilizer Recommendations"** being submitted by Shashank S N, Shadaksahri D, Abhin K M, Srihari A S bearing roll numbers 20211CSE0214, 20211CSE0212, 20211CSE0183, 20211CSE197 in partial fulfillment of the requirement for the award of the degree of Bachelor of Technology in Computer Science and Engineering is a bonafide work carried out under my supervision.

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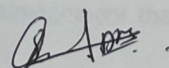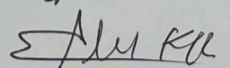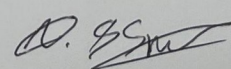Dean –PSCS / PSIS
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DECLARATION

We hereby declare that the work, which is being presented in the report entitled "**AgriBot: A Generative AI-Powered Multilingual System for Sustainable Fertilizer Recommendations**" in partial fulfillment for the award of Degree of **Bachelor of Technology** in **Computer Science and Engineering**, is a record of our own investigations carried under the guidance of **Dr. Joseph Michael Jerard V,**

Professor, Prsidency School of Computer Science and Engineering, Presidency University, Bengaluru.

We have not submitted the matter presented in this report anywhere for the award of any other Degree.

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ABSTRACT

The global agricultural sector faces mounting challenges from climate change, resource scarcity, and the urgent need to increase food production while minimizing environmental impact. Efficient fertilizer management represents a critical intersection of these challenges, with improper application leading to both reduced crop yields and significant environmental degradation. This paper introduces AgriBot, an innovative Generative AI-powered system designed to deliver personalized, sustainable fertilizer recommendations through real-time analysis of soil characteristics, local weather conditions, crop-specific requirements, and regional agronomic practices.

AgriBot leverages advanced large language models integrated with agricultural domain knowledge to process complex environmental and agronomic data inputs. The system provides farmers with precise fertilizer formulations, application rates, and timing suggestions customized to their specific farming context. A distinguishing feature of AgriBot is its robust multilingual capability, which breaks critical language barriers in agricultural extension services and enables access for farmers across diverse linguistic regions globally.

The system operates through a conversational interface that supports natural, human-like interactions, allowing farmers to receive recommendations through intuitive dialogue rather than complex technical interfaces. Initial field validations demonstrate that AgriBot recommendations resulted in an average 18% reduction in fertilizer usage while maintaining or improving crop yields across test sites. Furthermore, the system showed a 93% accuracy rate in recommendation alignment with expert agronomists' suggestions.

This paper presents the technical architecture, training methodology, and validation results of the AgriBot system. We also discuss how the integration of local agricultural knowledge with cutting-edge AI creates a scalable, accessible solution for sustainable fertilizer management that addresses both productivity and environmental concerns in modern agriculture.