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FACULTY OF ENGINEERING AND TECHNOLOGY
**DEPARTMENT OF ELECTRONICS AND ELECTRICAL
ENGINEERING**
DIPLOMA IN ELECTRONICS AND ELECTRICAL ENGINEERING

**ASSESSMENT OF EARTHING RESISTANCE AND LIGHTNING
ARRESTER PERFORMANCE AT BUSITEMA UNIVERSITY**

BY:
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BU/UP/2023/1013

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**A FINAL YEAR PROJECT REPORT SUBMITTED TO THE
ELECTRICAL AND ELECTRONICS ENGINEERING DEPARTMENT
IN THE PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR
THE AWARD OF DIPLOMA IN ELECTRONICS AND ELECTRICAL
ENGINEERING AT BUSITEMA UNIVERSITY**

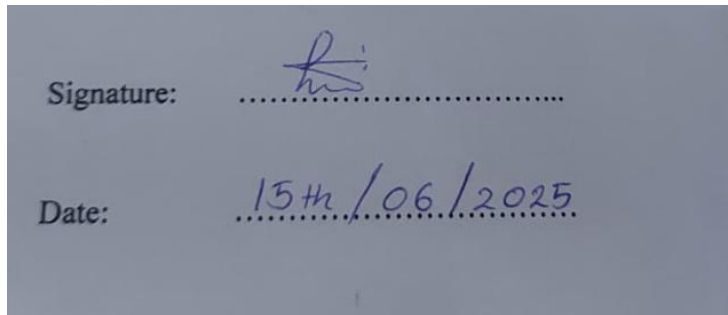
DECLARATION

I, **SSONKO RAYMOND** affirm that the work presented in this report is my original work and has not been submitted to any other institution or examination body for academic credit.

This report is the result of our own research and finding, and where the work of others has been used, it has been fully acknowledged through appropriate referencing.

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APPROVAL

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I would like to thank the Lord for His gift of wisdom, knowledge, and for enabling us to reach this far as per our academic journey.

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ABSTRACT

This study evaluates the effectiveness of earthing systems and lightning arrester performance at Busitema University. Reliable grounding and surge protection are essential for electrical safety, helping to prevent equipment failure and reduce the risk of electric shock. The assessment involved visual inspections and quantitative field measurements of earth resistance using the fall-of-potential method with a Megger DET4TD2 tester. Initial measurements were taken at key locations, including the library, student halls, staff quarters, and the faculty building. Two additional rounds of testing were later conducted: one during hot weather conditions and another shortly after rainfall, while also covering previously inaccessible sites. The results revealed significant variations in earth resistance, with most areas exceeding the recommended safety threshold of 5 ohms. Elevated temperatures correlated with higher resistance values due to decreased soil moisture. The lightning protection assessment showed that several buildings lacked functional arresters or complete grounding connections. These findings highlight the importance of regular inspections, environmental considerations during testing, and timely corrective action to ensure compliance with electrical safety standards.

The study contributes to enhancing electrical safety and guiding future maintenance strategies at the university.

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LIST OF ABBREVIATIONS

Abbreviation	Full form
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers
Ω	Ohm
DET	Digital Earth Tester
PPE	Personal Protective Equipment
LV	Low Voltage
P1	Potential Electrode 1 (Green terminal)
P2	Potential Electrode 2 (Yellow terminal)
C1	Current Electrode 1 (Black terminal)
C2	Current Electrode 2 (Red terminal)
TN-S	Terra Neutral-Separate (Neutral and protective earth are separate throughout the system)
TN-C-S	Terra Neutral-Combined and Separate (Combined in part of the system and separate in others)
TT	Terra-Terra (The consumer has their own local earth electrode separate from the supply earth)
TN-C	Terra Neutral-Combined (Neutral and protective earth are combined in one conductor throughout)
IT	Isolated Terra (Earthing system where the neutral is not connected to earth, or connected via a high impedance)

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