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FACULTY OF ENGINEERING

DEPARTMENT OF ELECTRICAL ENGINEERING

SMOOTH STARTING OF A DC MOTOR BASED ON POWER CONVERTOR

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A REPORT SUBMITTED TO THE DEPARTMENT OF

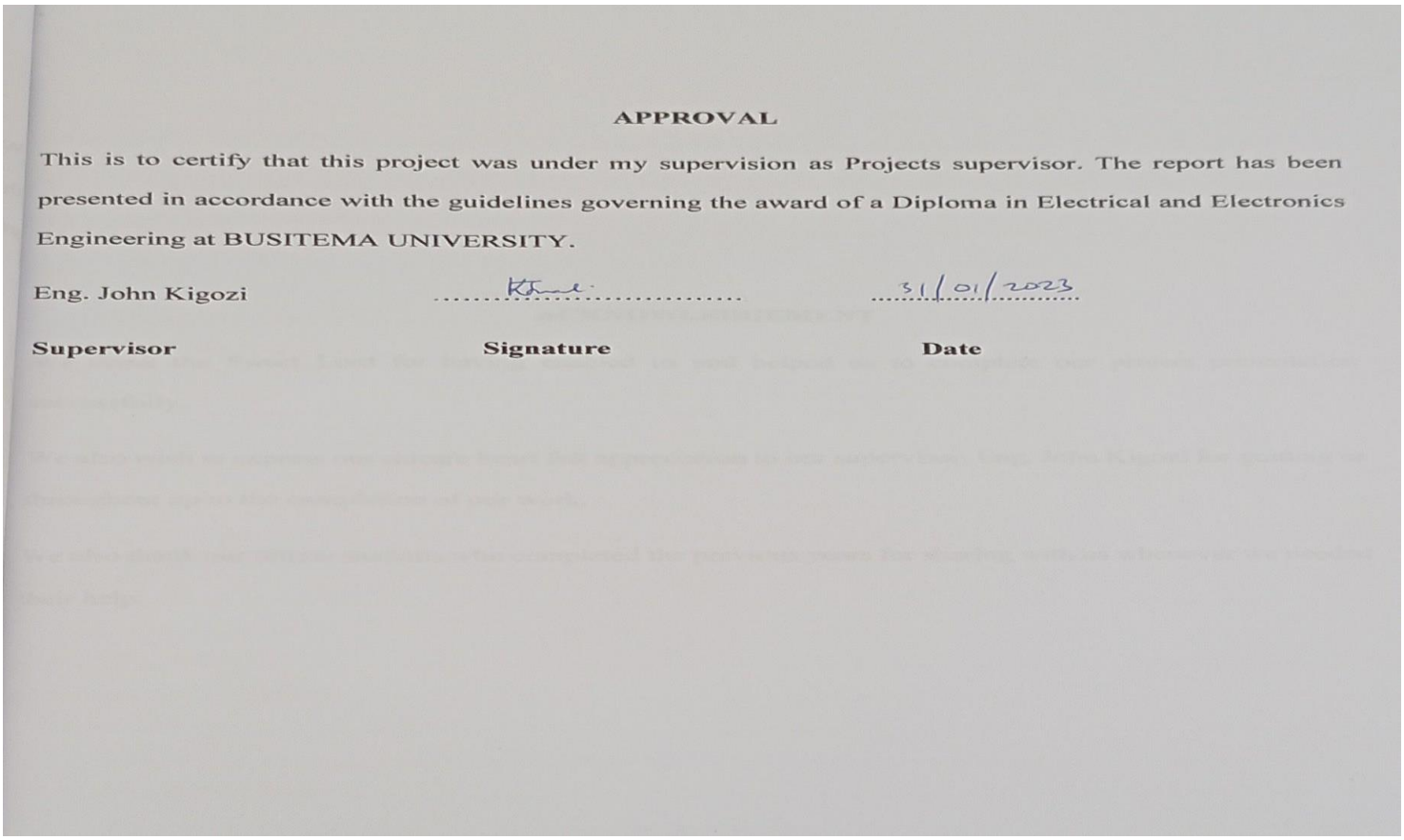
ELECTRICAL ENGINEERING IN PARTIAL FULFILLMENT FOR THE AWARD OF DIPLOMA IN ELECTRICAL AND ELECTRONICS ENGINEERING AT BUSITEMA UNIVERSITY.

DECLARATION

We the project members hereby assert that this project report is unique and has been done by ourselves with the help of our supervisor Eng. John Kigozi and has not been submitted for any other diploma award and effort will be that it will never be reproduced.

APPROVAL

This is to certify that this project was under my supervision as Projects supervisor. The report has been presented in accordance with the guidelines governing the award of a Diploma in Electrical and Electronics Engineering at BUSITEMA UNIVERSITY.



APPROVAL

This is to certify that this project was under my supervision as Projects supervisor. The report has been presented in accordance with the guidelines governing the award of a Diploma in Electrical and Electronics Engineering at BUSITEMA UNIVERSITY.

Eng. John Kigozi 31/01/2023

Supervisor **Signature** **Date**

ACKNOWLEDGEMENT

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1.0 INTRODUCTION

DC motor drives are commonly operated with a closed loop speed control, wherein tachometers or pulse encoders are coupled to the motor shaft to provide the feedback speed signal.

DC Motor drives which use DC-to-DC power converters have been reported in Boldea and Nasar. Applications are commonly found in computers, telecommunications, aeronautics, power factor correction (PFC) and industrial applications. The fundamental topologies, widely used in the DC-to-DC conversion, are: the “buck”, “boost” and “buck-boost” converters. These converters provide voltage and current ratings for various loads at a constant switching frequency. DC to DC power converters can be used as suitable controlled electronic “starters” for any DC machine. In this particular instance we focus attention on the combination of a “Buck” converter and a DC motor. The idea is to provide a controlled input voltage to the motor so that the shaft angular velocity tracks a desired smooth equilibrium-to-equilibrium angular velocity trajectory.

1.1 Background

DC machines mainly motors are widely used for example rolling mills, steel mills. Locomotives electric vehicles and high precision digital tools have been stated. These motors draw huge amounts of current, about (4-6) four to six times higher than the rated load current of current winding wire.

Generally, to control the step less velocity and smoothness, adjustment of armature voltage of motor has been used. Certainly, by applying pulse width modulation (PWM) signals with respect to the motor input voltage is one of the methods most employed to drive a dc motor? However, the underlying hard switching strategy causes an unsatisfactory dynamic behavior, producing abrupt variations in the voltage

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