



بسم الله الرحمن الرحيم

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AIN SHAMS UNIVERSITY
FACULTY OF ENGINEERING
Electrical Power and Machines Department

MITIGATION OF HARMONICS OF RENEWABLE ENERGY SYSTEMS BY USING ACTIVE POWER FILTER TECHNIQUES

By

Eng.: Muhammad Ossama Mahmoud Abdelrazeq
M.Sc. in Electrical Engineering, Cairo University, 2015

A Thesis Submitted in Partial Fulfillment of the Requirements of the Degree
of **Doctor of Philosophy**

In

Electrical Engineering (Electrical Power and Machines Engineering)

Supervised by

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Dr. : Wael Mohamed Mamdouh

Cairo - (2022)



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