

Declaration by Research Scholar Originality of Research Work

I declare that thesis entitled "*OPTIMAL ALLOCATION OF SVC, TCSC AND UPFC USING KINETIC GAS MOLECULAR OPTIMIZATION AND CUCKOO SEARCH ALGORITHM*" is my own work conducted under the supervision of **Dr. DHARMESH J. PANDYA** at Department of Electrical Engineering, Faculty of Engineering and technology, Atmiya University, Rajkot, Gujarat, India and approved by the Director of Research.

I further declare that to the best of my knowledge the thesis does not contain any part of any work which has been submitted for award of any degree either in this University or any other University without proper citation.

Date: 21/01/2023

Place: Rajkot

K. J. Bhayani
Signature of the Research Scholar

[Kishan Jivandas Bhayani]

Certificate of Supervisor

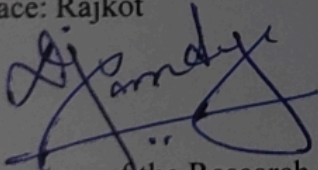
This is to certify that work entitled "*OPTIMAL ALLOCATION OF SVC, TCSC AND UPFC USING KINETIC GAS MOLECULAR OPTIMIZATION AND CUCKOO SEARCH ALGORITHM*" is a piece of research work done by **Kishan Jivandas Bhayani** under my supervision for the degree of Doctor of Philosophy in Department of **Electrical Engineering**, Faculty of Engineering and Technology, Atmiya University, Rajkot, Gujarat, India

To the best of my knowledge and belief the research work and thesis

- I. Embodies the work of candidate himself,
- II. Has duly been completed,
- III. Fulfils the requirement of ordinance related to Ph.D. degree of the University &
- IV. is up to the standard both in respect of content and language for being referred to the examiner.

Date: 31/01/2023

Place: Rajkot


Signature of the Research Supervisor

[Dr. Dharmesh J. Pandya]

Thesis Approval Form

The Viva-Voce of the Ph.D. thesis entitled "*Optimal Allocation of SVC, TCSC and UPFC using Kinetic Gas Molecular Optimization and Cuckoo Search Algorithm*" submitted by **Bhayani Kishan Jivandas (Enrolment No. 190153001)** was conducted on **27/01/2023 (Friday)** at Atmiya University, Rajkot, Gujarat

Based on the Performance of the Candidate, We, the panel of examiners, recommend that
(Please tick any of the following)

1. He / She be awarded Ph.D. Degree
 2. He / She be awarded Ph.D. Degree with minor modification

Please Suggest Modification

3. The following modifications are to be incorporated in the thesis within one month and viva-voce be re-conducted by the same panel of examiners

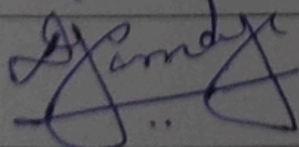
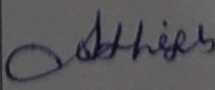
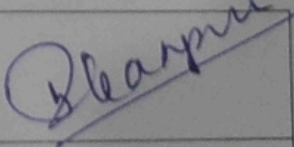
Please Suggest Modification

4. He / She should not be awarded Ph.D. Degree

Please mention Reason for Rejection

Date: 27/01/2023

Place: Rajkot

Signature			
	Research Supervisor	University Nominee	External Examiner

Declaration by Research Scholar
Submission of Thesis

I declare that the submitted thesis entitled "*OPTIMAL ALLOCATION OF SVC, TCSC AND UPFC USING KINETIC GAS MOLECULAR OPTIMIZATION AND CUCKOO SEARCH ALGORITHM*" incorporates

1. All the suggestions / directions / modifications / additions / deletions received from the supervisor and the external examiners through their thesis evaluation reports.
2. All the suggestions / directions / modifications / additions / deletions received from the panel of examiners during the public viva-voce (Open Defence) conducted on 27/01/2023

Date: 31/01/2023

Place: Rajkot

K. J. BHAYANI

Signature of the Research Scholar

[Kishan Jivandas Bhayani]

Acknowledgment

” To achieve something that we had never before, we need to do something better which we have never done before.”

First, I would like to thank the **almighty**, for giving me the strength and health to do this work until it was done.

I wish to express my deepest gratitude to my research supervisor **Dr. Dharmesh J. Pandya**, Associate Professor and Head, Department of Electrical Engineering, Atmiya University, Rajkot for his constant guidance, encouragement, and support. I warmly acknowledge and express my special thanks for his inspiring discussions and infallible suggestions.

Further, I am deeply indebted to my Doctoral Progress Committee (DPC) members, **Dr. K. K Dudani**, Assistance Professor, Department of Electrical Engineering, LEC Morvi. and **Dr. Dinesh Kumar** Associate Professor - Computer Engineering - AI & BIG DATA, Marwadi University Without their valuable suggestions and cooperation this study would not have taken shape. immense experience and knowledge on the subject were extremely helpful in the successful completion of this research work.

I am also thankful to the **Honorable President, Pro-Chancellor, Vice-Chancellor, Registrar, Controller of Examination, Dean Transformative Academics, Deputy Registrar** of Atmiya University Rajkot for their permission, assistance, and support for this research work. I am grateful to my Ph.D. thesis examiners for sparing their valuable time to evaluate the thesis.

Special thanks to **Dr. Ashish Kothari**, Deputy Registrar of Atmiya University Rajkot for their continuous support and guidance throughout this journey.

I would also like to express my thanks to my parent institute, **VVP Engineering College**, Rajkot for providing all kinds of support during my research work I sincerely acknowledge my gratitude to **Principal, Head and All the staff members of Electrical Engineering Department.**

As it is a prolonged journey, maybe I have forgotten a few names to consider, but nonetheless, they remain a core part of this mammoth task, and I seek forgiveness for the same and offer my kind respect to every one of them.

I am very thankful to my **mom** for all their support during the tenure of my research. **Krishna**, my wife, my friend who always stood by my side in all difficult times of my life and provided support and encouragement to complete research work. **Diya**, my wonderful daughter, has helped to lift my spirits naively during difficult times. Blessings and encouragement from **my brother** and my **sister-in-law** are unparalleled. They have supported me throughout my journey. A big thank you to them.

I would like to dedicate my THESIS to my **Late. Father**, Words can hardly describe my thanks and appreciation to you. You have been my source of inspiration, support, and guidance. You have taught me to be unique, determined, and to believe in myself.

Signature of the Research Scholar
[Kishan Jivandas Bhayani]