ACKNOWLEDGEMENTS

This PhD thesis is simply the culmination of a few years of ardent learning and research experience. Throughout these years, I have received much support from research guide, my family and friends. This is not just the words in these pages but each word acknowledges my deep gratitude to all those who played a pivotal role in the same and without whom this thesis would not have been possible.

First of all, I acknowledge my sincere gratitude to my research guide of this thesis, **Dr. D. B. Talange**, Professor, Department of Electrical Engineering, Government College of Engineering, Shivajinagar, Pune for his excellent guidance and constant encouragement. Thank you so much Sir, for being there with all these words of inspiration, wisdom and optimism that always helped me to see the bright side of things. You kept me going when my faith was faltering.

I am very grateful to **Dr.K.Vijaymohanan**, Director-CECRI, Karaikudi, Dr. **Uday Mhaskar**, Schneider Electric, Bangalore, Dr.**Ramesh Bansal**, Queensland University, Australia, Dr. **Dhanraj Rathod**, ITT, Dublin, Ireland, for all their help in development of supercapacitor and also being kind to provide the encouragement throughout. I will never forget their help and kindness and still our collaboration is continuing. I express my sincere thanks to **Mr. Vijay Kelkar**, Tata Motors, Pune, Mr. **Vilas Rabde**, CEEPL, Pune for their timely help and also being kind and considerate throughout my modeling and testing work.

I would like to express my profound gratitude to Director and Principal of Army Institute of Technology, Dighi, Pune for their kind support during the course of this study. I gratefully acknowledge Late Dr. S. R. Ghate, Ex-Principal- AIT for encouraging me to get registered for Ph.D. I also thank Dr. (Mrs) Sujata Marathe, HOD- ASGE and all staff members of ASGE department for their direct or indirect help in my research work. I would like to acknowledge my deepest gratitude to Mr. Mahesh Kumar Roy, Scientist, R&D Engineers, Dighi, Pune for his funding support at initial stage of my research work.
I would also like to gratefully acknowledge Dr. B. N. Chaudhari, HOD-Electrical Engineering Department, Government College of Engineering, Pune, Dr. V. S. Bandal, Dr. Manoj Rathod, Dr. (Mrs.) M. Y. Khaladkar, Dr. S. S. Dambhare, Dr. (Mrs.) A. A. Dharne, Dr. (Mrs) Rege, Dr. Sutavane, Dr V.N. Pande and other members of research review committee for their inputs regarding my work during my progress seminars. I thank Dr. Gitanjali Vaidya (BOS chairman) and Dr. G. K. Kharate, (Dean - Engineering) for their indirect help in my thesis submission. I also thank Dr.(Mrs.) M. A. Joshi (Dean-R&D), Dr. S. D. Agashe (Dean – Academics), Dr. A. D. Sahatrabudhe, Director, COEP, Pune for helping me in filing patents.

Most helpful during my experimental work were Vishal Rengade, Mr. Devendra More and Mr J. Gaikwad along with Tusshar S., Vinay Kelkar, Ms. Saumya Jetly, Sourabh Chaudhary, Prasun, Akshaya Dekate, Atul Kumar Singh, Ansuman Sarkar, Raj Pal, Amit Kumar and Gary Singh of AIT, Pune. If there were not energetic cooperation and help of my friends Prof L. S. Godse, Prof Datta Chavan, Late Prof P. V. Bhat and Mr R. P. Ambike, this work would not have been done.

Last but not least, the deepest thanks to all my parents, wife, son, my brother and sister for emotional support without which, this work would never been possible.