ACKNOWLEDGEMENT

The completion of the work for this thesis represents the opportunity to remember numerous individuals who have influenced my attitude towards Ph.D. studies. I would like to acknowledge my debt to my professors and family.

First and foremost, I would like to express my immense gratitude to my supervisor **Prof. (Dr.) D. N. Vishwakarma** and Co-supervisor **Prof. (Dr.) R. K. Saket**, who have not only given me a platform to work on my favourite research topic but also through his sheer dedication, patience, stimulating suggestions and serene discussions, motivated me to improve my work and come up with different ideas. The completion of this thesis would not be possible without their guidance and persistent help during my research work. Their fatherly nature is the source of my inspiration and is the driving force that keeps me always on track to achieve my goal. Thanks to my supervisors for making my life meaningful on this planet.

My profound gratitude to **Prof. (Dr.) D. Singh,** Head of Department of Electrical Engineering, Indian Institute of Technology (Banaras Hindu University), Varanasi for providing effective management, necessary facilities and valuable suggestions for the success of this work. I would also like to thank all the faculty members and staffs of the Department of Electrical Engineering, IIT (BHU), Varanasi for their kind cooperation and encouragement during the course of the work. I would like to express my special thanks to **Dr. Soumya Ranjan Mohanty**, Associate Professor, Department of Electrical Engineering, for giving me continuous support and for creating a friendly and happy environment needed for completion of this research work. Further I'd like to thank Mr.Udit Prasad for his valuable help and constant inspiration to get my work done in streamline manner.

Finally, I wish to thank my Parents (Shri Ramji Prasad & Smt. Gulabi) and Father-inlaw (Shri.S.P. Singh) along with my beloved wife Mrs Sarita Singh as well as my son Mr. Shubham Singh, and my near and dearest relatives. I wish to express indebtedness to them, for their unconditional love, extreme patience and constant support over the years. From the core of my heart, I dedicate this thesis to Almighty God for his constant blessing in disguise in difficult part of my life.

(Sanjay Kumar)

Date: 22/07/2019