ACKNOWLEDGEMENT

I would like to express my deep sense of gratitude to my research guide Dr. S. M. Khairnar, Professor and Head, Department of Engineering Sciences, MIT Academy of Engineering, Alandi, Pune-412105, Maharashtra for whole-hearted and the careful attention, motivation and support he gave me during the tenure of my Ph.D. Because of his untiring guidance and trust, I could work continuously and simultaneously as well as do research for Ph.D. degree. He has always encouraged and guided me to work for the good research and participate in national and international conferences to present our research work. He would listen patiently while I explained all sorts of uncertain ideas and he also led me towards more fruitful ones. His confidence in me was a great help. In fact, I am fortunate enough to work with such a great scholar and exponent.

I would like to express my thanks to my Co-Supervisor, Dr. Mahender Singh, Assistant Professor Department of Physical Science, JJT University, Jhunjhunu, Rajasthan, India for his encouragement and co-operation throughout my research. I am very thankful to him for his timely help during my visits to the university. I record my indebtedness to Dr. Vinod Tribrewala, Chancellor, JJT University, Jhunjhunu, Rajasthan, India for his keen cooperation during the Ph.D. registration process. He has given opportunity and extended all the necessary help to other university candidates.

I would like to take this opportunity to thank President, Secretary and all members of the Management Committee of Dnyaneshwar Gramonnati Mandal, Ale for their kind permission and co-operation during my research work. I would express my sincere appreciation to Principal D. B. Date and S. D. Wakchaure; Prof. K. N. Borkar, Prof. A. R. Gulave, Prof. J. H. Gadekar, Prof. G. K. Shrirame, Prof. R. C. Bhujabal, Prof. D.B. Diwate, Prof. B. S. Darekar, Mr. T. D. Sahane, Librarian Smt. Borkar L. S. and all my colleagues from Hon. Balasaheb Jadhav Arts, Commerce and Science College, Ale for their moral support, kind co-operation and constructive criticism during my research work.
I deeply express my sense of gratitude to my beloved parents; my father Shri. Ganpat Shankar Jadhav and my mother Shalini. I find no words to express my feelings towards my cousin uncle Shri. Janardan Baburao Kodre, aunt Subhadra, also my cousin brother Shri. Vilas Bhikoba Tanpure and brother in law Nirmala Vilas Tanpure for providing me hospitality and taking care of me during my undergraduate and post graduate educations and during the research work.

I also intensely express my vigorous feeling to my wife Mrs. Hemalata who efficiently looked after the family during the span of my research work and due to her co-operation I was able to do and complete this research work. My whole hearted love goes to my sons Rohit and Vinit for their support.

Also I am thankful to my brothers in law Mr. Malhar Yewale and Santosh Yewale for their co-operation for providing traveling facilities to collect the research papers and research materials from my research guide and research center.

Last but not least I acknowledge deep appreciation to Mrs. Kiran S. Khairnar for her sincere encouragement during publishing research papers and completion of research work.

I thank one and all who have directly or indirectly assisted me for successful completion of my research work.

Mr. Pravin Ganpat Jadhav