## Acknowledgement

First and foremost, I am thankful to God and my parents for being my strength and providing me the opportunity to progress successfully. During my Ph.D. program lots of people helped and guided me, I would like to take this space to thank them.

Special thanks to my respected guide Dr. Rajesh C. Shah, Associate Professor, Department of Applied Mathematics, for accepting me as a Ph.D. student. His thoughtful and valuable advices, essential comments, constant encouragement has helped me a lot. His continuous guidance during the course of the study has been a great moral boost.

My sincere thanks to Dean, Faculty of Technology & Engineering, The Maharaja Sayajirao University of Baroda, Vadodara for providing facilities to carry out this work.

I express my deep sense of gratitude to the faculty members of Department of Applied Mathematics, Faculty of Technology & Engineering - Dr. D. C. Vakaskar (Professor and Head), Professor S. Ramamohan, Professor P. S. Kantawala, Professor D. P. Patel, Dr. B. M. Shah, Dr. T. P. Shah, Dr. S. B. Rao, Dr. P. K. Pandit, Dr. J. P. Sharma, Dr. B. S. Ratanpal, Mrs. N. N. Shah and Mrs. N. S. Pathak.

I am grateful to members of my doctoral committee Dr. R. C. Tandel (Professor and Head), Professor (Dr.) J. S. Dave, Department of Applied Chemistry, The Maharaja Sayajirao University of Baroda, for their useful comments during my research work.

I would also like to thank Dr. Haribhai R. Kataria, Professor and Head, Department of Mathematics, Faculty of Science, The Maharaja Sayajirao University of Baroda, for his consistent encouragement throughout the course of this work.

I express special thanks to my employer Som-Lalit Education and Research Foundation (SLERF), Ahmedabad - Professor K. S. Shastri, Chairman, Shri Pragneshbhai Shastri Managing Trustee, and Principal K. J. Patel, for their selfless support, motivation and allowing me to utilize infrastructure and resources during this work. I am also thankful to my colleagues at

Som-Lalit Institute of Computer Applications - Mr. Bhavin D. Shah, Mr. Kamesh Raval, Ms. Dipali Shah, Ms. Rachana Gendiwal, Mr. Amit Bardhan and Ms. Khyati Shah for their unconditional support, without which, it would have been more challenging for me.

I am thankful to Mr. Kanakbhai Dalal, Books India publication, Ahmedabad for his indirect support during this course of work.

Sincere thanks to research friends Dr. Dilip Patel, Ms. Darshana Patel, Dr. Nayan Patel, Mr. M. M. Parsania and Mr. Rajiv Shah for useful academic discussions and their help towards the successful completion of this work.

Acknowledgement is due to the teaching assistants Mr. Amar Mangrola, Mr. Anil Chavda, Mr. Nirav Dave, Ms. Nirati Bhadarka, Mr. Shardav and Mr. Yash Sule for their constant support during my research work. I am also thankful to office staff Ms. Madhuri Wardy and Ms. Sapna for their administrative support during my course of work. I thank to the attendants of the department for their helping hands.

Also my acknowledgements wouldn't be complete if I didn't thank my wife Ramila and my sweet children for being there, no matter what.

I also express my sincere gratitude to the authorities of The Maharaja Sayajirao University of Baroda, Vadodara, for providing me with ample facilities for my research study.

Lastly, I thank everyone who has directly or indirectly contributed and supported me while pursuing this research work. It is not an individual success but a success of everyone who has been concerned about me.

December, 2016 Ramesh C. Kataria (M.Sc.)