

## Acknowledgement

The realization of this work was only possible due to collaboration of several people, to whom I desire to express my gratefulness. First and foremost, I offer my sincerest gratitude to my research supervisor, Professor (Dr.) Dhanesh P. Patel, who supported me throughout my research. I fall short of words while describing the efforts put in by him. I shall always be grateful to him since he accepted me as a research student, at a time when I was frantically searching for an able guide. A person with a futuristic vision, he has always insisted in being punctual, sincere and hardworking. He also stresses on sharing of strengths, which is the key to the formation of a good working atmosphere. He has always applauded and encouraged the results in my work and has always instilled great faith in me. He has helped me to evolve as a more confident individual. I am very much thankful to him for putting me in the track of this research.

My sincere thanks to Professor(Dr.) Arun Pratap, Dean, Faculty of Technology & Engineering, The Maharaja Sayajirao University of Baroda, Vadodara for all help he has extended to me.

I express my deep sense of gratitude to Dr. B. M. Shah, Head, Department of Applied Mathematics and all the members of Department of Applied Mathematics, Faculty of Technology & Engineering, The Maharaja Sayajirao University of Baroda, Vadodara for providing me all necessary help during my research work.

I express my special thanks to Dr. D. J. Patel, Managing Trustee, Parul University, Limada, Waghodiya, Vadodara, for their constant support, motivation and allowing me to utilize infrastructure and resources during this work. I am also thankful to my colleagues at Parul University for their unconditional support, without which, it would be difficult to finish the work.

I am deeply thankful to my brother Snehal and his wife Dhvani and his sweet children Rudra, Diya for their unconditional support, love and encouragement.

How can I miss, the guidance, affection, warmth and support of my father Umedbhai Patel, who is always a source of inspiration and strength for all my endeavors and he is always with his little girl.

I am thankful to Mr. Vipul Bhatt, Department of Mathematics, Polytechnic, The Maharaja Sayajirao University of Baroda, Vadodara, for giving me kind and moral support during my research work. I am highly indebted to Ms. Nilima Shah Department of Applied Mathematics, Faculty of technology and Engineering, The Maharaja Sayajirao University of Baroda, Vadodara and Mr. Anil Chauhan Department of Applied Mathematics, Faculty of technology and Engineering, The Maharaja Sayajirao University of Baroda, Vadodara, for standing by me at the final stage of my work.

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.

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.

Finally, I would like to thank my better half Shailesh and my sweet daughters Archi and Tithi who spread happiness in my life. Above all, I owe it all to Almighty God for granting me the wisdom, health and strength to undertake this research task and enabling me to its completion.

**Date:**  
**Place:** Vadodara

**Shilpa S. Patel**