Acknowledgement

Foremost, I would like to express my sincere gratitude to my guide Dr. Purnima Pandit for the continuous support of my research. I am thankful for her patience, motivation, enthusiasm and immense knowledge. She helped me in researching and writing this thesis. I could not have imagined a better guide for my Ph.D. work. From her, I shall always learn to be dedicated, punctual and energetic.

I express my deepest thanks to Prof. (Dr.) B. M Shah and the entire Applied Mathematics department for their constant motivation and providing necessary facilities during my work.

I would like to thank my research mates Mrs. Prani Mistry and Mr. Sardav Bhatt for their cooperation and feedback.

I would like to thank Dr. Falguni Acharaya (Hod) and colleagues Mr. Ashok Tejwani, Dr. Mrudul Jani, Mr. Chirag Trivedi and Mrs. Jagruti Wankhede for their support and motivation. I acknowledge the people who mean to me a lot, my parents Mr. Narendra Singh, Mrs. Pushpa Singh and my mother-in-law Mrs. Girish Kumari Singh.

Finally, this thesis work is dedicated to my husband Mr. Parmesh Singh who has been a constant source of support and encouragement during the challenges of life. I am truly thankful for having him in my life. I could not achieve anything without his unconditional support. He has taught me to work hard for the things that I aspire to achieve. I greatly value his contribution and deeply appreciate his belief in me.

Payal Singh

April, 2022