Acknowledgement

First and foremost I would like to praise and thank to almighty Lord Shri Krishna for his abounded blessing on me to make my every move successful. I do obeisance in thanks and gratitude for all his blessings, due to which I was able and successful to complete this strenuous work.

I wish to record my deep sense of gratitude to the Vice-Chancellor of Pondicherry University for given me the opportunity to carry out this work under the doctoral research programme.

I would like to appreciate and thank to the University Grants Commission, Govt. of India, New Delhi, for providing financial support to carry out the first part of thesis work as a project fellow under the major research project during the tenure of Ph.D. thesis. Further, I also would like to thank to Pondicherry University authorities for granting the University fellowship after completion of the tenure of MRP for completing this thesis work.

Words are inadequate to express my deep sense of gratitude to my reverent supervisor Dr. Navin Chandra, Department of Statistics, Pondicherry University, for his expert guidance, patient hearing, constant support, valuable suggestions and constant encouragement all through the years. He showed me novel ways to approach a research problem and the need to be persistent to accomplish the goal. Apart from the research area, I learnt a lot from him, which I am sure, will be helpful in different stages of my life. I feel very fortunate to work under his able supervision and I sincerely thank him from the bottom of my heart.

I wish to offer my sincere thanks to the doctoral committee members Dr. P. Tirupathi Rao, Head, Department of Statistics and Dr. D. Bharathi Mohan, Department of Physics, Pondicherry University for their guidance, insightful comments and suggestions during continuous progress meetings.

I express my deepest gratitude to Prof. P. Dhanavanthan, Dean, Ramanujan School of Mathematical Sciences, Pondicherry University for his valuable advice, encouragement and support.

My special thanks to Dr. P. Tirupathi Rao, Head, Department of Statistics, Pondicherry University for his cooperation, encouragement and furnishing all necessary facilities to complete this work in time.
I wish to extend my sincere gratitude to all the teachers of the department Dr. J. Subramani, Dr. Kiruthika, Dr. Sudesh Pundir, Dr. R. Vishnu Vardhan and Dr. V.S. Vaidyanathan for their moral support and wholehearted cooperation.

I wish to thank the university authorities and library staff for providing necessary help whenever required. I also express my thanks to all non-teaching staff of the department for their kind help and cooperation during my course.

I am greatly indebted to all my research colleagues and friends who encouraged me throughout this work. I am especially grateful to Dr. Mashroor Ahmad Khan as my senior mentor, Dr. Balaswamy S., Dr. Vani Lakshmi R. and Dr. Sameera G. for their continuous support during my thesis work. I would also like to thank to Dr. G. Kumarapandiyana, Dr. R. Amala, Dr. Jayabharathiraj, Dr. Kiran Kumar Paidipati, Dr. Azhar Uddin, N. Padmapriya, S. Abarna, Sharon, Ajith, Qaiser, Arif and Rahman for creating a healthy environment and sharing of ideas during the research.

It is also my bounden duty to express my hearty thanks to my friends Dr. Bithin Thakur, Mamta Thakur, Ajit Kumar, Navin Bharti, Rajesh, Abhishek, Pooja, Ajeet Kumar Singh, Saurabh Kumar, Surbhi Suman, Haldhar, Abhay, Parmeet for their good wishes and constructive help from time to time in various aspects of life during my thesis work.

Words fail me to express my indebtedness and gratitude to my Daddy and Mummy and my grandparents for their unequivocal support throughout, as always, for which my mere expression of thanks likewise does not suffice. They have done everything possible to see me at this place. They have always helped me in good and bad times alike to keep me focused towards my goal. Their unflagging love, energetic support and persistent confidence in me, has taken the load off my shoulder and clearing the path towards thesis completion. I would also like to appreciate and thank to my brothers Prakash, Akash, Raj and Aditya and my lovely sister Madhu for their affection and support towards me. I feel shortage of words to pay thanks to my other family members and relatives who devoted their trust and love to me throughout my years of studies.

I take this opportunity to express my gracious concern towards all of them, who helped me by any ways throughout the development of this thesis. For those whose names are not mentioned, I express my sincere apologies and profound gratitude from the bottom of my heart.

Finally, the responsibility is entirely mine for any errors or inadequacies that may remain in this work.

Vikash Kumar Rathaur