ACKNOWLEDGEMENTS

First of all, my salutation to lord Shiva, the reigning deity of holy city Kashi, for making my sojourn fruitful, I bow my head to Mahamana Pandit Madan Mohan Malviya, founder of this legendary Banaras Hindu University is Pandit Malviyaji's crowning achievement. It is a stupendous souvenir to his peculiar genius, audacity in conception and his persistence in execution. This university symbolizes Malviyaji's respect for the past, confidence in the present and hope for the future generation of mother India.

It is a matter of great joy to express my feelings and gratitude to my supervisor **Prof. Tanmoy Som** and co-supervisor **Prof. Subir Das**, Department of Mathematical Sciences, IIT (BHU) for their enthusiastic guidance, patience and for providing me the requisite facilities to carry out my doctoral research. Their continuous support and assistance have indeed impetus my endeavors. I am deeply indebted to my supervisors for their stimulated suggestions and continuous encouragement, without their keen supervision and sagacious guidance; it would not have been possible for me to complete this work. I especially thank them for sharing their vast knowledge and teaching to me.The knowledge I learned from them, is much more than, one can expect from a supervisor.

I would like to express my sincere thanks to The Head and The Convener, DPGC of the Department of Mathematical Sciences and my research plan committee RPC members Late Prof. O P Singh, Dr. P. Ghosh (Mechanical Department), Prof. L. P. Singh for their support throughout my research work. I acknowledge my deep sense of gratitude to all Faculty Members of the Department of Mathematical Sciences, especially Prof. S. Mukhopadhyay, Dr. Rajeev, Dr. V. K. Singh, Dr. R. K. Pandey for their valuable suggestions, appreciation and encouragement. I am also grateful to all non-teaching staff members of the Department for their support.

I am thankful to all my research colleagues Dr. Vijay Kumar Yadav, Dr. Piush Singh, Ajit Kumar Singh, Vandana Tiwari, Shivam Shreevastava, Avinash Dixit and Pankaj Gautam for their help, spontaneous support and encouragement while writing the thesis.

I am also thankful to my best friends Dr. Lokesh Kumar, Dr. Arun Kumar, Kamalakar Surwade, Sandeep Kumar Omre, Dr. Jitendra Saha, Vikas Tripathi, Shiva Sharma for igniting and continuously inspiring me, I am not sure I would have done my Doctorate without their continuous moral support and encouragement.

I thank all my friends from IIT Guwahati and IIT BHU specially Dr. Mrigendra Dubey, Dr. Dileep Kumar Sharma, Dr. Manish Kumar Singh, Dr. Subedar Ram, Dr. Navin Jha, Shailendra Tiwari, Chandrashekhar Singh, Pappu Kumar, Vijay Kumar Shukla, Vijay Patel, Gopal Gupta, Raj Kumar Gupta, Yogesh Kumar Singh, Subham Jaiswal, Sumit Jaiswal and others for providing their support and keeping me in good spirits.

I am grateful to the University Grants Commission (UGC), New Delhi, India for providing the financial support in my research under the Rajiv Gandhi National Fellowship JRF/SRF scheme with Student ID: F1-17.1/2012-13/RGNF-2012-13-SC-JHA-14929.

I express my sincere and heartiest gratitude to my respected mother **Smt. Savitri Devi** and father **Shri. Madan Prasad Rajwar** for their extreme patience, support and motivation. I am also thankful to my siblings **Bhola Nath Rajwar, Kavita, Rupesh** and **Rupendra** for their support.

Finally, I extend my thanks to very understanding better half of my life, **Suchitra Rajwar** for making so many sacrifices, living without me, being my best friend and a true soul mate.

Last but not the least again; I bow down before the almighty Lord Shiva who made my dream come true.

Ghanshyam Prasad