Acknowledgements

First of all, I would like to express my heartfelt gratitude and indebtedness to my Supervisor **Dr. Subir Das**, Associate Professor, Department of Mathematical Sciences, IIT (BHU) for his enthusiastic guidance, patience and for providing me the requisite facilities to carry out my doctoral research. His continuous support and assistance have indeed impetus my endeavours. I am deeply indebted to my supervisor for their stimulated suggestions and continuous encouragement without his keen supervision and sagacious guidance it would not have been possible for me to complete the work. I especially thank him for sharing his vast knowledge and teaching me. I also learned from him which is much more than one could have expected from the supervisor.

I would like to express my sincere thanks to **Prof. L. P. Singh**, Head and **Prof. Rekha Srivastava**, Convener, DPGC of the Department of Mathematical Sciences for their support throughout my research work. I acknowledge my deep sense of gratitude to all faculty members of the department, especially **Prof. K. N. Rai**, **Dr. S. Mukhopadhyay**, **Dr. Rajeev**, **Dr. V. K. Singh**, **Dr. R. K. Pandey** and RPEC members **Prof. T. Som** and **Prof. D. Singh** (Electrical Engineering) 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 colleague researchers **Dr. Vijay**, **Prashant**, **Neeraj**, **Shubham**, **Pragya**, **Anup**, **Anuwedita** and **Rakesh** of the department for providing spontaneous support during writing the thesis and also for keeping me in good spirits.

I am grateful to the University Grants Commission (UGC), New Delhi, India for providing the financial support throughout my research under the JRF-NET and SRF-NET scheme with Student ID : 201314-NETJRF-10465-14.

I express my sincere and heartiest gratitude to my respected mother **Smt. Bindu Singh** and father **Shri Rajendra Singh** for their extreme patience and encouragement. I am also thankful to my sisters **Archana** and **Pratima** for their support.

Finally, I extended my thanks to my wife **Madhulika** and daughter **Advika** for making so many sacrifices.

Above all, I bow down before the **Almighty** who made my dream a reality.

Ajit Kumar Singh