

### ACKNOWLEDGEMENTS

I would like to express my deep sense of gratitude and indebtedness to Professor S.B. Khadkikar for his invaluable guidance, inspiration, encouragement, prolific collaboration and innumerable discussions I had with him throughout the course of the work. I have enormously benefited through his close contact, both academically and non-academically. I am extremely grateful to him for going through the manuscript of the thesis and several suggestions for its improvement.

I am extremely grateful to Professor S.P. Pandya for his keen interest and encouragement during the entire course of the work. I extend my sincere and heartfelt thanks to Professor K.H. Bhatt and Professor J.C. Parikh for their continued interest in the work and several valuable discussions. I have benefited a great deal through my association with them.

I would like to take this opportunity to thank Dr. M.R. Gunye who has been the fountainhead of the Hartree-Fock programme along with Professor S.B. Khadkikar.

I extend my sincere thanks to Dr. D.R. Kulkarni for his sustained interest and fruitful collaboration in the initial phase of the work. To Dr. S.K. Sharma for

numerous discussions and friendly attitude. To R.U. Haq, A.K. Dhar, V. Satyan, Dilip Ahalpara and J.J. Dikshit for several interesting discussions and creating a healthy academic atmosphere. To Dr. Vijay Potbhare for his keen interest, many instructive discussions and offering his kind assistance towards the completion of the thesis.

I extend my heartfelt thanks to my friends and colleagues Messrs. S. Bujarbarua, P.K. Chaturvedi, P.N. Guzdar, A.S. Sharma, Mukul Sinha, Bhupen Goswami, Dhiraj Bora, B.G. Ananda Rao and V.H. Gandhi for their selfless and ever-helping attitude. To R.K. Jain, A.P. Gohil, Dr. V.K. Garde and Dr. D. Mahanti for the kind assistance rendered at various stages. To Krishna Kumar for his assistance in the final stages of the preparation of the manuscript.

At this moment, I remember with a heavy heart, my friend and colleague, the late Jayarama Rao. His sudden demise was an irreparable loss on personal level. I shall always cherish the memories of the days we spent together.

I consider myself to be extremely fortunate to have come across Professor A.C. Das and Mrs. Arundhaty Das. During those agonizing moments of anxiety and despair, their encouragement and inspiration have always come to my rescue. In Mrs. Arundhaty Das, I found a loving, inspiring and affectionate sister. I owe immensely to them for all that they have bestowed on me in my life.

I would like to extend my sincere thanks to Dr. Sushma Trivedi for her consistent interest in the work, selfless attitude and amiable and ever-helping nature. I also thank Mrs. Vasundhara Khadkikar for her warm nature and friendly attitude towards me.

I extend my sincere thanks to the National Council of Educational Research and Training for the award of the scholarship under the National Science Talent Search Scheme during the period 1966-1975.

I acknowledge with gratitude the co-operation extended to me by Dr. Dinesh Patel. I extend my sincere thanks to the staff of the Computing Centre, especially to Mr. P. S. Shah. I also thank the staff of the photography and documentation sections and the library for the co-operation extended to me.

Finally, I would like to thank Mr. V. Sahadevan for the excellent typing of the thesis directly from the hand-written manuscript and Mr. Ghanshyam Patel for the neat cyclostyling of the thesis. I thank Mr. K. Venugopalan for designing the first page of the thesis.