ACKNOWLEDGEMENT

It is my great privilege to express my deep sense of gratitude and profound thanks to my beloved guide Dr. G. Nagarajan, Professor, Department of Mechanical Engineering, for his invaluable, thought provoking, extraordinary and patient guidance. He was a constant source of knowledge and inspiration during my work. Because of his practical approach and helping attitude, it was a pleasure for me to work with him. I am forever indebted to him not only for his research guidance but also for his suggestions and encouragement especially during difficult times, which really boosted my confidence level.

I am extremely thankful to the Doctoral Committee members Dr. B. Nagalingam, Former Professor, IIT Madras, Chennai and Dr. E. Natarajan, Professor, Department of Mechanical Engineering, Anna University, Chennai for their valuable guidance, encouragement and the moral support extended to me throughout my research work.

I would like to thank Dr. L. Karunamoorthy, Head, Department of Mechanical Engineering, Anna University, Chennai and Dr. P. Thamilporai, Head of I.C Engineering Division, Anna University, Chennai for their invaluable suggestions.

I thank all my family members, friends and colleagues for their moral support and encouragement to complete this research work successfully.

P. VIJAYABALAN