Acknowledgments

First of all, my deepest gratitude to the Almighty for his providence and blessings.

One of the greatest gifts to a research scholar is the presence of the supervisor who provide the needed support in terms of insight into the domain of work, constructive criticism and direction to retain focus in the area of work. I consider myself fortunate that I had Dr. Kaushik M. Patel as Guide. It is my proud privilege to express my sincere gratitude to my supervisor Dr. Kaushik M. Patel for his invaluable guidance, kind cooperation, constant encouragement and moral support throughout the research work.

I would also like to thank members of my research progress committee, Prof. R. N. Patel and Prof. B. A. Modi of Mechanical Engineering Department, Institute of Technology, Nirma University, Prof. D. S. Sharma, Mechanical Engineering Department, Faculty of Technology and Engineering, M.S. University, Baroda and Prof. Rahul Mulik, Mechanical and Industrial Engineering Department, IIT Roorkee for their valuable suggestions and insightful comments given during my all progress seminars. I am also thankful to all of them for all the necessary help, constant encouragement and moral support throughout the research work.

I am very much thankful to Dr. K Kotecha (Ex-Director, Institute of technology, Nirma University) and Dr. P. N. Tekwani (In charge Director, Institute of technology, Nirma University) who always encouraged and motivated me for doing quality research. I am grateful to the Management of Nirma University for giving permission to pursue Ph.D. and providing infrastructural facility. I feel pleased to acknowledge the love, affection and support received from my colleagues of Mechanical Engineering Department, Institute of Technology, Nirma University.

My special thanks to our technical staffs and assistants namely, Mr. Jayesh D Panchal, Mr. Ramjibhai H Patel, Mr. Abhijat Joshi, Mr. Ramanbhai M. Parmar and Mr. Dilipbhai S. Pandya for helping me as and when required during the research work.
I am also thankful to M. Tech students Sanjay, Gaurang, Ashish, Kalpesh, Parag, Viren and Mehul for their help during my research work.

I express my heartfelt gratitude to my parents for their constant support and encouragement. I am also grateful to my wife Kajal and son Jatan, who have taken pains along with me and without which this work would not have seen the light of success.

I recognize that this research would not have been possible without the financial support from Science and Engineering Research Board (SERB) of Department of Science and Technology (DST), New Delhi, India, sanctioned through letter SR/S3/MERC/0108/2012.

At last, I extend my sincere thanks to all those who helped me directly or indirectly in the research work.

Date: Nilesh D Ghetiya