ACKNOWLEDGEMENT

The contentment that accompanies the successful achievement of any chore would be incomplete without the expression of gratitude and appreciation to the people who made it possible with their support.

I wish to place on record my sincere thanks, indebtedness and deep sense of gratitude to my guide Dr. D. P. Girish Professor and HOD, Dept. of Mechanical Engineering, Govt. Engineering College, Ramanagara and Dr. K. Prahlada Rao Professor, JNTUA College of Engineering, Anantapuramu, for the inspiration, encouragement, suggestions and guidance that I received from them during the course of present investigations are beyond evaluation. I am extremely grateful for the cooperation extended to me by them till the completion of this work.

I express my heartfelt gratitude to Dr. B. Uma Maheshwar Gowd, Director, Admissions, JNTUA College of Engineering, Anantapuramu, for his valuable guidance, continuous support, timely help and encouragement throughout my course.

I also express my heartfelt gratitude to Dr. M. Krishna, Research and Development(Head) and Professor, R.V. College of Engineering, Bangalore for his guidance, continuous support, timely help and valuable suggestions throughout my course.

I would also thank Dr. Y. S. Ramamohan, Associate Professor, B.M.S. College of Engineering, Bangalore for his technical suggestions, perpetual support, timely help and encouragement throughout my
I am sincerely thankful to all Professors, Department of Mechanical Engineering, JNTUA College of Engineering, for their constant support, encouragement and making necessary arrangements for carrying out this dissertation. I also thank all the supporting staff of Mechanical Engineering Department, JNTUACE.

I thank Dr. MANJUNATHA, Principal, New Horizon College of Engineering, Marathalli, Bangalore for his immense support in completion of the work.

My sincere thanks to Dr. M.S. GANESHPRASAD, HOD, DME, NHCE, for constant encouragement.

I thank all my teachers for their interest and support enabling me interest on me to do this research work.

SANJAY KUMAR S.M.