## ACKNOWLEDGEMENTS

In my opinion, doing M.Tech is an arduous but achievable task with its ups and downs. Additional energy and vitality for this research was provided externally through my participation and presentations in several Workshops and Conferences. Overall it has been a unique learning experience where patience is the key to success and satisfaction. This thesis is the result of one year of devoted work towards Nanotechnology in Civil Engineering at Department of Civil Engineering, Delhi Technological University, Delhi, whereby I have been accompanied and supported by many people. It is a pleasant aspect that I have now the opportunity to express my gratitude for all of them. I am going to try anyway and if your name is not listed, rest assured that my gratitude is not less than for those listed below.

The first person I would like to thank is my supervisor **Dr. Awadhesh Kumar**. His overly enthusiasm and integral view on research and his great efforts to explain things clearly and simply, has made a deep impression on me. Throughout my thesis-writing period, he provided encouragement, sound advice, good teaching, good company and lots of good ideas. This has greatly helped me to bring the thesis in its present form. I would have been lost without him.

I wish to thank **Prof. Ashutosh Trivedi**, Head of the Department of Civil Engineering, DTU, Delhi, for who he is as a professor: an enthusiastic, sagacious, honest minded individual with broad interests and provides steady support in the most difficult times. In the same spirit I wish to express my sincere gratitude to **Prof. Nirendera Dev** for having shown me the way of research. He could not even realize how much I have learned from him.

I would like to thank **Prof. Mohammed Arif,** Chairman, Civil Engineering Department, Aligarh Muslim University, Aligarh who kept an eye on the progress of my research work and always was available when I needed his advises. I would also like to thank other faculty members of the Department for their support and sympathy during the research work.

I am grateful to **Dr. Ameer Azam**, Department of Applied Physics, Nanotechnology Division, AMU, Aligarh who helped me to understand basics of the research work with his valuable suggestions and comments. It was a pleasure to work with him all time support and encouragement.

I would also like to thank **Dr. J.N. Malik**, Civil Engineering Department, IIT Kanpur, **Dr. M. Masroor Alam**, Civil Engineering Department, AMU, Aligarh, **Dr. S.P. Singh**, National Physical Laboratory, Delhi and **Dr. Wasi Khan**, Department of Applied Physics, Nanotechnology Division, AMU, Aligarh for extending their facilities available to complete the research work.

Thanks are also due to **Maaz**, USIF, Aligarh Muslim University for performing SEM & TEM analysis.

I am grateful to my all lab colleagues and seniors for providing a stimulating and working environment for the research work.

I can't skip mentioning my friends for their contributions to various stages of this research and for helping me get through the difficult times.

I wish to extend my thanks to Nazir Bhai, Usama Bhai and Shehroz and all other non-teaching and technical staff of the Department of Civil Engineering, AMU, Aligarh for their kindness and dedication. The essential facilities and invaluable support provided by the whole staff of Library and Concrete lab were appreciable.

I would like to acknowledge Mr. Naushad Ahmad Ansari, Department of Mechanical Engineering, DTU, Delhi and Mrs. Zarrin Irshad here as special persons throughout my life as a student and as their trust and unfaltering encouragements set me on the right track.

I wish to thank my entire extended family for their prayers and their encouragements throughout my research work. I owe my parents much of what I have become. I thank them for their love, their support and their confidence throughout the past twenty-seven years. My parents have always put education as a first priority in my life and raised me to set high goals for myself. They taught me to value honesty, courage and humility above all other virtues. I have always needed to work hard to achieve my goals in life and they have always been there for me as an unwavering support. I dedicate this work to them, to honour their love, patience and support during these years.