

CANDIDATE'S DECLARATION

I, **Devendra Kumar Sinha**, certify that the work embodied in this Ph.D. thesis is my own bonafide work carried out by me under the supervision of **Prof. Santosh Kumar** for a period of about **5 years** from **August 2010** to **August 2015** in **Department of Mechanical Engineering, Indian Institute of Technology (Banaras Hindu University), Varanasi**. The matter embodied in this Ph.D. thesis has not been submitted for the award of any other degree/diploma.

I declare that I have faithfully acknowledged, given credit to and referred to the research workers wherever their works have been cited in the text and the body of the thesis. I further certify that I have not willfully lifted up some other's work, paragraph, text, data, results, etc., reported in the journals, books, magazines, reports, dissertations, thesis, etc., or available at web-sites and included them in this Ph.D. thesis and cited as my own work.

Date:

Place: IIT (BHU), Varanasi

(**Devendra Kumar Sinha**)

CERTIFICATE FROM THE SUPERVISOR

This is to certify that the above statement made by the candidate is correct to the best of our knowledge.

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