

## **CANDIDATE'S DECLARATION**

I, ***Manvendra Singh Chauhan***, certify that the work embodied in this Ph. D. thesis is my own bonafide work carried out by me under the supervision of ***Prof. Prabhat Kumar Singh Dikshit*** and co-supervision of ***Dr. Shyam Bihari Dwivedi***, for a period of four year and two months from *July, 2011* session to *August, 2015* in the *Department of Civil 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, para, 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

(Manvendra Singh Chauhan)