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It is certified that the work contained in the thesis titled “**Numerical schemes based on matrix approach for mathematical models with integers and non-integers orders**” by Ms. **Vinita Devi** has been carried out under my supervision and that this work has not been submitted elsewhere for a degree.

It is further certified that the student has fulfilled all the requirements of Comprehensive Examination, Candidacy and SOTA for the award of Ph.D. Degree.

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DECLARATION BY THE CANDIDATE

I, **Vinita Devi**, certify that the work embodied in this thesis is my own bona fide work and carried out by me under the supervision of **Dr. Vineet Kumar Singh** from **July 2016** to **November 2020** at the Department of Mathematical Sciences, Indian Institute of Technology (Banaras Hindu University), Varanasi. The matter embodied in this thesis has not been submitted for the award of any other degree/diploma. I declare that I have faithfully acknowledged and given credits to the research workers wherever their works have been cited in my work in this thesis. I further declare that I have not wilfully copied any other's work, paragraphs, text, data, results, *etc.*, reported in journals, books, magazines, reports dissertations, theses, *etc.*, or available at websites and have not included them in this thesis and have not cited as my own work.

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It is certified that the above statement made by the student is correct to the best of my knowledge.

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