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I, **Nishant Kumar Singh**, declare that the work embodied in this Ph.D. thesis is my own bonafide work carried out under the supervision of **Dr. Sanjay Kumar Rai** and co-supervision of **Dr. Nilanjan Mallik** and **Dr. S. K. Panda** for a period of about 5 years 8 months from September 2011 to May 2017 at the School of Biomedical Engineering, Indian Institute of Technology (Banaras Hindu University), Varanasi. The matter embodied in this thesis has not been submitted for the any other degree/diploma.

Date:

Place: IIT (BHU), Varanasi

(**Nishant Kumar Singh**)



**SCHOOL OF BIOMEDICAL ENGINEERING
INDIAN INSTITUTE OF TECHNOLOGY
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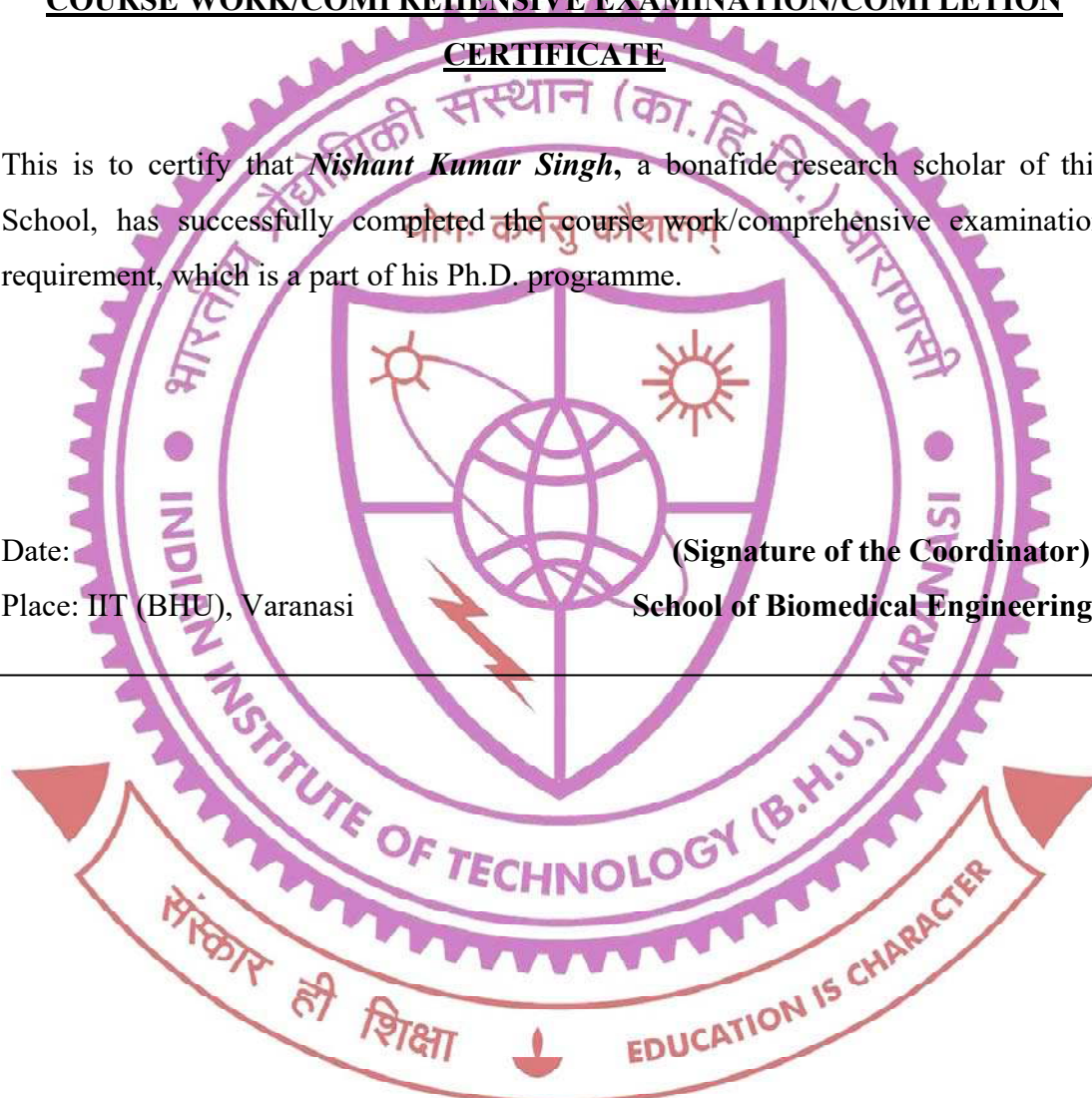
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This is to certify that **Mr. Nishant Kumar Singh**, a bonafide research scholar of this School, has successfully completed the pre-submission seminar requirement on the topic “*Design and analysis of novel hip implants driven by shape memory alloy and study the effect of eccentric screw on vascular injury during total hip replacement*” on dated 26-11-2016, which is a part of his Ph.D. programme.

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Title of the Thesis: *“Design and analysis of novel hip implants driven by shape memory alloy and study the effect of eccentric screw on vascular injury during total hip replacement”*

Candidate’s Name: **Mr. Nishant Kumar Singh**

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