



BIRLA INSTITUTE OF TECHNOLOGY & SCIENCE
PILANI – 333 031 (RAJASTHAN) INDIA

CERTIFICATE

This is to certify that the thesis entitled “**Design, Simulation and Experimental Investigations on Scaled Up Branched Flagellated Artificial Nanoswimmer**” submitted by **Shivani Nain**, ID. No. **2012PHXF0424P** for award of Ph.D. Degree of the institute embodies original work done by her under my supervision.

Signature of the Supervisor

Dr. JITENDRA SINGH RATHORE

Assistant Professor

Department of Mechanical Engineering

Birla Institute of Technology & Science, Pilani - 333 031 Jaipur (Raj.)

Date: 16 March, 2020

Signature of the Co-Supervisor

PROF. NITI NIPUN SHARMA

Pro President & Dean-Faculty of Engineering

Manipal University, Jaipur - 303 007 (Raj.)

Date: 20 March, 2020