



**TEZPUR UNIVERSITY
SCHOOL OF ENGINEERING
DEPARTMENT OF ENERGY**

Forwarding Certificate

We hereby recommend that the thesis prepared under our supervision by **Pranay Kumar Sarkar** entitled "***THERMODYNAMIC OPTIMIZATION OF BIOMASS GASIFICATION AND COAL-BIOMASS CO-GASIFICATION PROCESS: AN EXTENSIVE PARAMETRIC STUDY BY USING NON-STOICHIOMETRIC EQUILIBRIUM MODELING***" be accepted in partial fulfillment of the requirements for the degree of Master of Technology in Energy Technology.

Sadhan Mahapatra
26/05/2014

Sadhan Mahapatra
Internal Supervisor
Department of Energy
Tezpur University



Prof. D. Deka
Head
Department of Energy
Tezpur University



Prof. D K Bhattacharyya
Dean
School of Engineering
Tezpur University

Dean
School of Engineering.
Tezpur University
Date.....



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Certificate of Approval

The foregoing thesis by **Pranay Kumar Sarkar (Roll Number ENE12015)** is hereby approved as a creditable study carried out and presented in a manner satisfactory to warrant its acceptance as a pre-requisite to the degree for which it has been submitted. It is understood that by this approval the undersigned do not necessarily endorse or approve any statement made, opinion expressed or conclusion drawn therein but approve only for the purpose for which it is submitted.

Committee On

Final Examination for

Evaluation of Thesis

 27/05/19

DECLARATION

I, Pranay Kumar Sarkar, hereby declare that this thesis entitled "***Thermodynamic Optimization of Biomass Gasification and Coal - Biomass Co-gasification Process: An extensive parametric study by using Non-stoichiometric Equilibrium Modeling***" is submitted to the Department of Energy, Tezpur University, Tezpur, Assam, India for acceptance to award the degree of the Master of Technology in Energy Technology is prepared by me and the same has not been/is not being submitted to any other institution.

Date: 26/05/14
Place: Tezpur

Pranay Kumar Sarkar
Pranay Kumar Sarkar
Department of Energy
Roll Number ENE12015

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