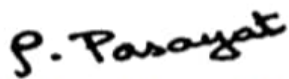


# CERTIFICATE

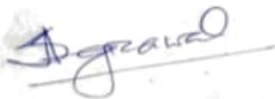
Certified that the work contained in the report titled “**DESIGN AND ANALYSIS OF HYBRID DATA SECURITY ALGORITHM WITH MESSAGE INTEGRITY TEST USING VHDL**” by (Ashis Kumar Samal- 1821105025), (AyanLodh- 1701105497), (B Manoranjan Patra- 1701105252), (Barsha Baisakhi Priyadarshini- 1701105152), (Madhusmita Das- 1701105499), (MonalishaSethi- 1701105173) has been carried out under my supervision and this work has not been submitted elsewhere for a degree.



Mr. Paresh Kumar Pasayat  
Assistant Professor & Supervisor,  
Dept. of Electronics and Telecommunication Engineering,  
Indira Gandhi Institute of Technology, Sarang.



Dr. Urmila Bhanja  
Head of the Department,  
Dept. of Electronics and Telecommunication Engineering,  
Indira Gandhi Institute of Technology, Sarang.



Dr. Sanjay Agrawal  
External Examiner,  
Associate Professor,  
Dept. of Electronics and Telecommunication Engineering,  
VSSUT, Burla.

# **CNN BASED DENOISING AND RECONSTRUCTION OF ENCRYPTED IMAGE**

A Project Report Submitted

in Partial Fulfillment of the Requirement

for the Degree of

**Bachelor of Technology**

in

**Electronics and Telecommunication Engineering**

by

**-Rani Pradhan (36835)  
-Soumya Ranjan Patra (36844)  
-Sibashish Mohapatra (36842)  
-Manaswita Panigrahi (36823)  
-Abhilipsa Panda (36849)  
- Saurav Badaik (36864)**



**DEPARTMENT OF ELECTRONICS AND TELECOMMUNICATION ENGINEERING**

**INDIRA GANDHI INSTITUTE OF TECHNOLOGY SARANG**

**DHENKANAL - 759146 (ODISHA)**

**JUNE, 2021**

# UNDERTAKING

We declare that the work presented in this report titled “*CNN Based Denoising and Reconstruction of Encrypted image*”, submitted to Electronics and Telecommunication Engineering Department, Indira Gandhi Institute of Technology, Sarang for the award of the *Bachelor of Technology* degree in *Electronics and Telecommunication Engineering* is our original work. We have not submitted the same work for the award of any other degree.

June, 2021

Place- IGIT, Sarang

Name of the Students

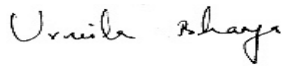
- Rani Pradhan (36835)
- Soumya Ranjan Patra (36844)
- Sibashish Mohapatra (36842)
- Manaswita Panigrahi (36823)
- Abhilipsa Panda (36849)
- Saurav Badaik (36864)

# CERTIFICATE

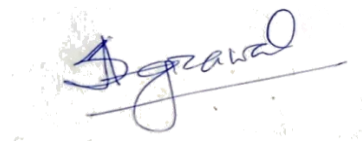
Certified that the work contained in the report titled “*CNN Based Denoising and Reconstruction of Encrypted image*”, by Rani Pradhan-1701105303, Soumya Ranjan Patra-1701105120, Sibashish Mohapatra-1701105533, Manaswita Panigrahi-1701105307, Abhilipsa Panda-1821105002 and Saurav Badaik-1821105131 has been carried out under my supervision and this work has not been submitted elsewhere for a degree.



Mr. Kodanda Dhar Sa  
Assistant Professor & Supervisor,  
Dept. of Electronics and Telecommunication Engineering,  
Indira Gandhi Institute of Technology, Sarang.



Dr. Urmila Bhanja  
Head of the Department,  
Dept. of Electronics and Telecommunication Engineering,  
Indira Gandhi Institute of Technology, Sarang.



Dr. Sanjay Agrawal  
Associate Professor, Electronics & Telecommunication Engg.  
VSSUT, Burla, ODISHA, INDIA  
External Examiner

# ACKNOWLEDGEMENTS

We would like to place my sincere, deepest appreciation, humble regards and heartfelt gratitude to our project guide **Mr. Kodanda Dhar Sa** for his guidance, simulating suggestion and tremendous help over the period of our study and project presentation. His constant encouragement, invaluable advice and motivation helped us all the time of research and writing of this report. We have felt encouraged by his friendly attitude and appreciation of our efforts. Without his supervision and help, this report would not have been achieved.

We are deeply thankful to **Dr. Urmila Bhanja**, Head of the Department, Electronics and Telecommunication Engineering, for her endless help throughout our research work. We would highly indebted to the whole **Electronics and Telecommunication Engineering Department, IGIT, Sarang** for providing with excellence academic circumstances that are essential to accomplish our report.

We express our sincere thanks to **Dr. Satyabrata Mohanta**, Director, IGIT, Sarang for allowing me to carry out the research work.


Last but not the least; We thank God Almighty for giving us an opportunity to excel in our efforts to complete the seminar on time.


**INDIRA GANDHI INSTITUTE OF TECHNOLOGY,  
SARANG, DHENKANAL – 759146**



**CERTIFICATE**

This is to certify that the project report entitled “SOLID MODELLING AND NUMERICAL SIMULATION OF AN INDUSTRIAL GEARBOX USING NANOLUBRICANTS” submitted by RAKESH RATAN JENA(1801105355), SASANKA SEKHAR KHATUA(1801105406), SHIBANI SUBHADARSINI(1801105435), SOMYARANJAN PRUSTY(1801105475), SRABANA KUMAR MURMU(1801105501), SUBIT KUMAR SAHOO(1801105519) of GROUP NO – 14 in partial fulfilment of requirements for the award of Bachelor of Technology degree in Mechanical Engineering at Indira Gandhi Institute of Technology, Sarang is an authentic work carried out under our supervision and guidance. To the best of our knowledge, the matter embodied in this project report has not been submitted to any other university/institute for the award of any Degree (UG/PG) or Diploma.

  
**Mr. Gaurab Kumar Ghosh**  
Asst. Professor  
Supervisor

  
**External Examiner**


Project Viva-voce held on... 24/5/2022

  
**H.O.D.**  
Mechanical Engg Dept  
I.G.I.T. Sarang

## **CERTIFICATE**

This is to certify that the report entitled, "Preparation and Characterization of Amine modified Activated Carbon from Corncobs for Carbon Dioxide capture" was carried out by us under the guidance of Dr.(Mrs.)Dipa Das for the partial fulfilment towards the award of Bachelor of Technology in Chemical Engineering under Indira Gandhi Institute of Technology, Sarang in academic year 2020-2021. This report has been examined and found to be satisfactory.

**Date:03-03-2021**

  
16/05/21  
**Dr. (Mrs.)Dipa Das**  
**Head Of the Department**  
**Chemical Engineering**  
**IGIT, Sarang**



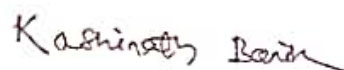
# CERTIFICATE

This is to certify that the report entitled "*Preparation of Bio-plastic Using Starch Derivatives*" submitted by Deepak kumar sahuo(1701105177), Suraj kumar(1701105439), Anil kumar sethi(1701105440), Ashutosh pradhan(1701105308), Brahmananda mohanty(1821105044), Chandrajit Sahoo(1701105585) in fulfillment of the requirement for the award of Bachelor of Technology Degree in Chemical Engineering at Indira Gandhi Institute of Technology, Sarang is an original work executed under the supervision of Kashinath Barik during the academic year 2020-21.



Dr. (Mrs.) Dipa Das

Head of the Department  
Chemical Engineering



Kashinath Barik  
Asst. Professor Dept. Of  
Chemical Engineering




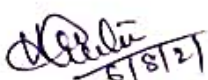


Indira Gandhi Institute of  
Technology Sarang

## CERTIFICATE

This is to certify that the report entitled, "**Preparation And Characterization Of NiCrBSi-Al<sub>2</sub>O<sub>3</sub> Composite Coatings**" was carried out by us under the guidance of **Dr. Harekrushna Sutar** for the partial fulfilment towards the award of Bachelor of Technology in Chemical Engineering under Indira Gandhi Institute Of Technology, Sarang in academic year 2020-2021. This report has been examined and found to be satisfactory.

  
16/05/21  
**Dr. (Mrs) Dipa Das**  
(Head of the Department)  
Chemical Engineering

  
6/8/21  
**Dr. Harekrushna Sutar**  
(Asst. Professor)  
Chemical Engineering  
**Harekrushna Sutar**  
**Assistant Professor**  
Chemical Engineering Dept.  
I.G.I.T., Sarang

Date: 04.06.2021

## CERTIFICATE

This is to certify that the report on the Project entitled 'Mathmetical modelling by MATLAB to a hydrodynamic behavior of spouped bed and fluidized bed' is a bonafide record of the work carried out by Subrat Nayak (1831105160), Chinmaya Devjyotee Samantaray (1701105576), Sumant Kumar Sahu (1821105166), of 8<sup>th</sup> semester B-Tech, Indira Gandhi Institute of Technology, Sarang under my supervision and guidance towards the partial fulfillment of requirement for the award of the degree of Bachelor of Technology in Chemical Engineering at Indira Gandhi Institute of Technology, Sarang. To the best of our knowledge, the matter embodied in this thesis has not been submitted to any other university or institute for the award of any degree.



**Project Supervisor,**

**Date:** 4<sup>th</sup> June, 2021

**Place:** Sarang, Odisha

  
16/05/21

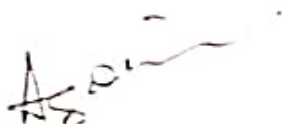
**Head Of Department**

**Dept. of Chemical Engg.**

**IGIT Sarang**

## CERTIFICATE

This is to certify that Anurag, Deeptimayee, Jiban, Jyoti, and Swastika of final year of Chemical Engineering has submitted Major Project report entitled "**Removal of Ammonia-Nitrogen from Wastewater by Adsorption**" in partial fulfillment for the award of "**Bachelor of Technology**" Degree in the department of **Chemical Engineering, Indira Gandhi Institute Of Technology, Sarang**. This project is a bonafide work performed by them under my guidance in the academic session 2020-2021.



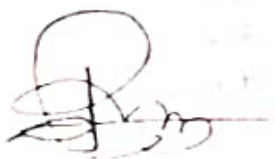
Mr. Anup Kumar Swain  
Assistant Professor  
Dept. of Chemical Engineering



Dr. (Mrs.) Dipa Das  
Head of the Department  
Dept. of Chemical Engineering

## CERTIFICATE

This is to certify that the major project report entitled "Preparation, Characterization and Performance analysis of SPEEK - based membrane in DMFC" submitted by Saaraa Mohanty, Saloni Misra, Soumya Ranjan Sethi, Sambeet Nayak, Priyanka Behera, Bijikanta Priyadarshy, Soumyansu Satabdi Das, Rakesh Kumar Subudhi, Brajeswari Pattanaik in partial fulfillment prerequisites for the award of the degree of "Bachelor of technology" in the department of Chemical Engineering, Indira Gandhi Institute Of Technology, Sarang. This project is a bonafide work disbursed by them under my supervision and guidance in the academic session 2017-2021.



Mr. Rabi Ranjan Murmu  
Assistant Professor  
Department of Chemical  
Engineering.



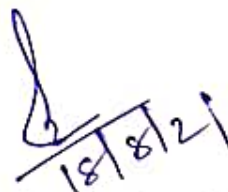
DR.(Mrs.) Dipa Das  
Head of the Department Of Chemical  
Engineering.

## CERTIFICATE

This is to certify that the major project report entitled "Preparation, Characterization and Performance analysis of Chitosan-based membrane in DMFC" submitted by K. Mohan Rao, Rohan Pratap Singh, Saunak Subudhi, Ajay Kumar Barik, Shibananda Sahu, Nikhil Ranjan Dash in partial fulfilment prerequisites for the award of the degree of "Bachelor of Technology" in the department of Chemical Engineering, Indira Gandhi Institute Of Technology, Sarang. This project is a bonafide work disbursed by them under my supervision and guidance in the academic session 2017-2021.

  
03.08.2021

Mr. Rabi Ranjan Murmu  
Assistant Professor  
Department of Chemical  
Engineering

  
18/8/21

Dr. (Mrs.) Dipa Das Head  
of the Department  
Department of Chemical  
Engineering





INDIRA GANDHI INSTITUTE OF TECHNOLOGY, SARANG  
(An autonomous Institute of Govt. of Odisha)

---

CERTIFICATE


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This is to certify that the project report entitled “Modelling, Simulation and Control of Isothermal Non-jacketed Continuous Stirred Tank Reactor” submitted by Anshuman Pradhan, Asit Kumar Behera, Bishnu Rajak, and Binayak Prasad Singh, Shazad Hussainy, to the Department of Chemical Engineering, Indira Gandhi Institute of Technology, Sarang, in partial fulfillment prerequisites for the award of the degree of “Bachelor of Technology” in the Department of Chemical Engineering is a bona-fide work disbursed by them under my supervision and guidance in the academic session 2020-2021.

  
16/05/21  
Dr. Dipa Das

H.O.D

Dept. of Chemical Engineering

  
04/06/2021  
Dr. Sudip Banerjee  
Assistant Professor

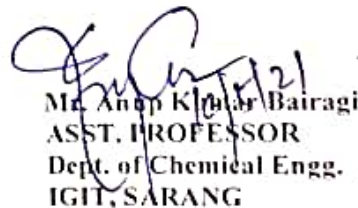
Dept. of Chemical Engineering

## CERTIFICATE

This is to certify that the report on the Project entitled 'Review of Chemical Leaching of Aluminium from Red Mud' is a bonafide record of the work carried out by Sai Sonali Nayak(1701105311), Manasha Ranjan Rath(1701105382), Arya Anindya(1701105384), Pritish Behera(1701105399), Nirmal Krushna Dash(1701105407), Satya Ranjan Nahak(1701105577), Siddhant Dash(1701105594), Niranjana Jena(1831105095), Tapan Kumar Khuntia(1831105181) of 8<sup>th</sup> semester B-Tech, Indira Gandhi Institute of Technology, Sarang under my supervision and guidance towards the partial fulfillment of requirement for the award of the degree of Bachelor of Technology in Chemical Engineering at Indira Gandhi Institute of Technology, Sarang. To the best of my knowledge, the matter embodied in this thesis has not been submitted to any other university or institute for the award of any degree.

  
16/05/21

Dr. Dipa Das  
HEAD OF DEPARTMENT  
Dept. of Chemical Engg.  
IGIT, SARANG

  
16/05/21  
Mr. Anup Kumar Bairagi  
ASST. PROFESSOR  
Dept. of Chemical Engg.  
IGIT, SARANG

Date- 4<sup>th</sup> June, 2021  
Place- Sarang, Odisha

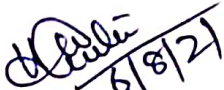


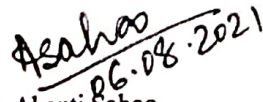



Department of Chemical Engineering  
Indira Gandhi Institute of Technology  
Sarang, 759146 (ODISHA)

### CERTIFICATE

This is to certify that the report entitled " A Review on the Synthesis of Graphene and effect of GNP thickness on the Mechanical, Thermal and Morphological Properties of Graphene Nanoplatelet Reinforced Polypropylene " submitted by Dibyani Sahu (Regd no-1907105001) in fulfillment of the requirement for the award of Masters of Technology Degree in Chemical Engineering at Indira Gandhi Institute of Technology, Sarang is an original work executed under the supervision of Dr. Harekrushna Sutar during the academic year 2020-21.

  
Dr. Harekrushna Sutar  
Assistant Professor  
Department of Chemical Engineering  
Indira Gandhi Institute of Technology  
Sarang, 759146 (ODISHA)

  
Dr. Abanti Sahoo  
Head of Department  
Chemical Engineering  
NIT Rourkela, Odisha  
(External Examiner)

  
Dr. Dipa Das  
Head of Department  
Department of Chemical Engineering  
Indira Gandhi Institute of Technology  
Sarang, 759146 (ODISHA)



Department of Chemical Engineering  
Indira Gandhi Institute of Technology  
Sarang, Dhenkanal, Odisha-759146

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### CERTIFICATE

*This is to certify that the project report entitled “Adsorptive removal of Ammonia-Nitrogen from wastewater” is a bonafide record of work submitted by KUNIKA SAMASI (1907105002) under the guidance of Mr. Anup Kumar Swain. It is submitted in partial fulfilment of the requirement for the award of the Degree of MASTER OF TECHNOLOGY in Chemical engineering, Indira Gandhi Institute of technology, Sarang, Odisha.*

Mr. Anup Kumar Swain  
Assistance Professor  
Department of Chemical Engineering  
Indira Gandhi Institute of Technology  
Sarang-759146 (Odisha)

Dr. (Mrs.) Dipa Das  
Head of the department  
Department of Chemical  
Engineering Indira Gandhi  
Institute of Technology,  
Sarang-759146 (Odisha)

Dr. (Mrs.) Abanti Sahoo  
Head of the Department  
Department of Chemical Engineering  
NIT Rourkela-769008 (Odisha)



**Indira Gandhi Institute of Technology**  
**Sarang**

**CERTIFICATE**

This is to certify that the report entitled, **“COMPARISON OF ADSORPTION CAPACITY OF AMINE MODIFIED ACTIVATED CARBON FOR CO<sub>2</sub> CAPTURE”** was carried out by us under the guidance of **Dr. Dipa Das** for the partial fulfilment towards the award of Master of Technology in Chemical Engineering under Biju Pattanaik University of Technology from IGIT, Sarang in academic year 2019-2021. This report has been examined and found to be satisfactory.

I considered that the thesis has reached the standards and fulfilling the requirements of the rules and regulations relating to the nature of the degree. The contents embodied in the thesis have not been submitted for the award of any other degree or diploma in this or any other university.

Dr. Dipa Das

GUIDE

Department of  
Chemical Engineering  
Indira Gandhi Institute  
of Technology

Sarang-759146  
(ODISHA)

Dr. Dipa Das

HOD

Department of  
Chemical Engineering  
Indira Gandhi Institute  
of Technology

Sarang-759146  
(ODISHA)

Dr. Abanti Sahoo

HOD

Department of  
Chemical Engineering  
National Institute of  
Technology

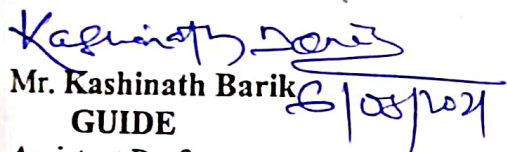
Rourkela-769008  
(ODISHA)

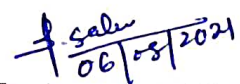



Department of Chemical  
Engineering Indira Gandhi Institute  
of Technology Sarang-759146  
(ODISHA)

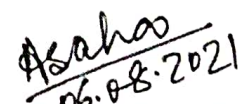
## CERTIFICATE

This is to certify that the report entitled "**Preparation of Bio-plastic Using Starch Derivatives**" submitted by **Rajalaxmi Rath ( Regd no-19071004)** in fulfillment of the requirement for the award of Masters of Technology Degree in Chemical Engineering at Indira Gandhi Institute of Technology, Sarang is an original work executed under the supervision of **Mr. Kashinath Barik** during the academic year 2020-21.

  
**Mr. Kashinath Barik**  
**GUIDE**  
Assistant Professor  
Department of Chemical Engineering  
Indira Gandhi Institute of Technology  
Sarang-759146 (ODISHA)

  
**Mrs. Brahmotri Sahoo**  
**CO-GUIDE**  
Assistant Professor  
Department of Chemical Engineering  
Indira Gandhi Institute of Technology  
Sarang-759146 (ODISHA)

  
**Dr. (Mrs.) Dipa Das**  
**HOD**  
Department of Chemical Engineering  
Indira Gandhi Institute of Technology  
Sarang-759146 (ODISHA)

  
**Prof. (Mrs.) Abanti Sahoo**  
**HOD**  
Department of Chemical Engineering  
National Institute of Technology  
Rourkela-769008 (ODISHA)



## CERTIFICATE

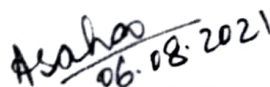
This is to certify that the major project report entitled "**The Effect of Ionic Liquids on CNT Modified Chitosan Composite Membrane for Direct Methanol Fuel Cell**" submitted by Subhasmita Jena in partial fulfilment prerequisites for the award of the degree of "**Master of technology**" in the department of **Chemical Engineering, Indira Gandhi Institute of Technology, Sarang**. This project is a bonafide work disbursed by her under my supervision and guidance in the academic session 2017-2021.



Mr. Rabi Ranjan Murmu  
Assistant Professor  
Department of Chemical Engineering  
Indira Gandhi Institute of Technology,  
Sarang-759146 (Odisha)



Dr. (Mrs.) Dipa Das  
Head of the department  
Department of Chemical Engineering  
Indira Gandhi Institute of Technology,  
Sarang-759146 (Odisha)

  
06.08.2021

Dr. (Mrs.) Abanti Sahoo  
Head of the Department  
Department of Chemical Engineering  
NIT Rourkela-769008 (Odisha) .



Department of Chemical  
Engineering Indira Gandhi Institute  
of Technology Sarang-759146  
(ODISHA)

## CERTIFICATE

This is to certify that the report entitled "**Wet coal beneficiation**" submitted by **Surendra Nath Dandasena ( Regd no-19071006)** in fulfillment of the requirement for the award of Masters of Technology Degree in Chemical Engineering at Indira Gandhi Institute of Technology, Sarang is an original work executed under the supervision of Mrs. **Brahmotri Sahoo** during the academic year 2020-21.

*B. Sahoo*  
*06/08/2022*  
Mrs. **Brahmotri Sahoo**  
**GUIDE**

Assistant Professor  
Department of Chemical Engineering  
Indira Gandhi Institute of Technology  
Sarang-759146 (ODISHA)

*K. Kashinath Barik*  
*06/08/21*  
Mr. **Kashinath Barik**  
**CO-GUIDE**  
Assistant Professor  
Department of Chemical Engineering  
Indira Gandhi Institute of Technology  
Sarang-759146 (ODISHA)

*D. Das*  
*06/08/2021*  
Dr. (Mrs.) **Dipa Das**  
**HOD**  
Department of Chemical Engineering  
Indira Gandhi Institute of Technology  
Sarang-759146 (ODISHA)

*A. Sahoo*  
*06.08.2021*  
Prof. (Mrs.) **Abanti Sahoo**  
**HOD**  
Department of Chemical Engineering  
National Institute of Technology  
Rourkela-769008 (ODISHA)

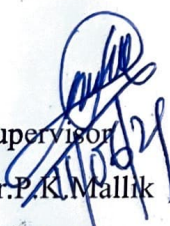



INDIRA GANDHI INSTITUTE OF TECHNOLOGY, SARANG



**CERTIFICATE**

This is to certify that the project report entitled **“PROCESSING AND ANTIBACTERIAL CHARACTERIZATION OF SMS SLAG”** submitted by **Bhagyasri Sahoo** in partial fulfillment of the requirements for the award of Master of Technology degree in **“METALLURGICAL & MATERIALS ENGINEERING”** of **Indira Gandhi Institute of Technology, Sarang**, is an authentic work carried out by him under my supervision and guidance. To the best of my knowledge, the matter embodied in the report has not been submitted to any other university/institute for the award of any Degree or Diploma.

  
Supervisor  
Dr. P. K. Malik  
Head of Dept.

  
Head of the Department  
Dr. P. K. Malik  
Head of Dept.

External Examiner

Metallurgical & Materials Engg Metallurgical & Materials Engg  
I.G.I.T, Sarang I.G.I.T, Sarang





**Department of Metallurgical and Materials Engineering**  
**Indira Gandhi Institute of Technology, Sarang**  
**ODISHA-759146**

## **CERTIFICATE**

This is to certify that the thesis entitled "Evaluation of Mechanical Properties of Glass/Carbon/Kevlar Reinforced Polymer Hybrid Composites" submitted by **Sonali Rout** (Registration Number: 1907105052) in partial fulfilment of the requirements for the award of **Master of Technology** in the *Department of Metallurgical and Materials Engineering*, Indira Gandhi Institute of Technology, Sarang is an authentic work carried out under my supervision and guidance.

To the best of my knowledge, the matter embodied in the thesis has not been submitted to elsewhere for the award of any degree.

  
**Supervisor**

**Dr. Suresh Chandra Patnaik**  
Professor  
Dept. of Metallurgical &  
Materials Engg.  
IGIT, Sarang

**Co-Supervisor**

**Dr. Ramesh Kumar Nayak**  
Assistant Professor-1  
Dept. of Materials &  
Metallurgical Engg.  
MANIT, Bhopal

  
**Head of Department**

**Dr. Prafulla Kumar Mallik**  
Associate Professor  
Dept. of Metallurgical &  
Materials Engg.  
IGIT, Sarang

**External Examiner**

**Date –**

**Place –**



Department of Electronics Engineering  
Indira Gandhi Institute of Technology, Sarang  
Dhenkanal-759146, Odisha

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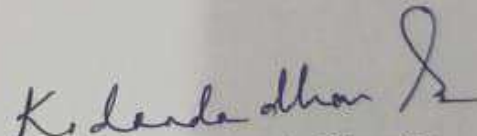
## CERTIFICATE

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This is to certify that the major project entitled "Multi – Focus image fusion" submitted by Priyanka Parija, Regd. No. 18071051072, Department of Electronics Engineering, Indira Gandhi Institute of Technology, Sarang; for partial fulfillment of the requirements for the degree of Master of Technology in Electronics Engineering with specialization in "Electronics & Telecommunication"; is a bonafide record of the work carried out by her under our supervision and guidance.

  
Dr. (Mrs.) Urmila Bhanja

( Head of the Department )

  
Asst Prof. Kodanda Dhar Sa

( Project Guide )