

**“STUDY ON P3HT:PCBM ORGANIC SOLAR CELL”**

Project Report submitted to

**CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA**

In partial fulfilment of the requirement for the award of the degree of

**BACHELOR OF PHYSICS**

Submitted by

**HRESHIKESH DEVRAJ**

**(CCAVSPH047)**

Under the supervision of

**Asst.Prof JOSE SUNNY**



**DEPARTMENT OF PHYSICS**

**CHRIST COLLEGE (AUTONOMOUS), IRINJALAKUDA**

**UNIVERSITY OF CALICUT**

**MARCH 2024**

**CHRIST COLLEGE (AUTONOMOUS)**  
**IRINJALAKUDA**  
**UNIVERSITY OF CALICUT**



s

**DEPARTMENT OF PHYSICS CERTIFICATE**

This is to certify that the project report entitled “**STUDY ON P3HT: PCBM ORGANIC SOLAR CELL WITH AN ADDITIONAL POLYMER LAYER USING OGHMA NANO SOFTWARE**” is a bonafide record of project done by HRESHIKESH DEVRAJ, Reg. No. CCAVSPH047, under my guidance and supervision in partial fulfilment of the requirement for the award of the degree of BACHELOR OF PHYSICS and it has not previously formed the basis for any Degree, Diploma and Associateship or Fellowship.

Prof. V.P Anto

Co-ordinator

Asst Prof .Jose Sunny

Project Guide

## DECLARATION

I **HRESHIKESH DEVRAJ**, hereby declare that the project work entitled “**Study of P3HT:PCBM Organic Solar Cell**” is recorded of independent and bonafide project work carried out by Me under the supervision and guidance of Mr. Jos Sunny, Asst. Professor, Department of Physics, Christ College Autonomous Irinjalakuda.

The information and data given in the report is authentic to the best of my knowledge .The report has not been previously submitted for the award of any Degree , Diploma , Associateship or other similar tile of any other university or institute

Place :

HRESHIKESH DEVRAJ

Date:

CCAVSPH047

Submitted for the examination held on :

Internal Examiner :

External Examiner:

## ACKNOWLEDGEMENT

I would like to take the opportunity to express my preferred thanks and gratitude to all people who have helped me with sound advice and able guidance

Above all, I express my eternal gratitude to lord almighty under whose divine guidance; I have been able to complete this work successfully.

I would like to express my sincere obligation to Rev. DR. Jolly Andrews CMI, our principal for providing various facilities.

I am thankful to Prof . V.P Anto coordinator of Department for providing proper help and encouragement in the preparation of this report.

I express my sincere gratitude to Mr. Jose Sunny , Asst. Professor on contract , whose guidance and support throughout the period helped me to complete this work successfully .

I would like to express my preferred gratitude to all faculties of the Department for their interest and cooperation in this regard

I extend my hearty gratitude to the Librarian and the Library staffs of my college for their whole hearted cooperation.

I express my sincere thanks to my friends and family for their support in completing this report successfully.

Place:

HRESHIKESH DEVRAJ

Date:

CCAVSPH047

# **“Smart IoT Irrigation System”**

Project Report submitted to

**CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA**

*In partial fulfilment of the requirement for the award of the degree of*

**BACHELOR OF PHYSICS**

Submitted by

**SABIQ MAHMOOD**

**(CCAVSPH048)**

Under the supervision of

**Asst.Prof.Megha P S**



**DEPARTMENT OF PHYSICS**

**CHRIST COLLEGE (AUTONOMOUS), IRINJALAKUDA**

**UNIVERSITY OF CALICUT**

**MARCH 2024**

**CHRIST COLLEGE (AUTONOMOUS), IRINJALAKUDA**  
**CALICUT UNIVERSITY**



**DEPARTMENT OF PHYSICS CERTIFICATE**

This is to certify that the project report entitled “**Smart IoT Irrigation System**” is a bonafide record of project done by **SABIQ MAHMOOD** , Reg.No. CCAVSPH048, under my guidance and supervision in partial fulfilment of the requirement for the award of the degree of BACHELOR OF PHYSICS and it has not previously formed the basis for any Degree, Diploma and Associateship or Fellowship.

**Prof.V.P.Anto**

**Asst.Prof. Megha. P.S**

**Co-ordinator**

**Project guide**

## **DECLARATION**

I, **SABIQ MAHMOOD** , hereby declare that the project work entitled “**Smart IoT Irrigation System**” is a record of independent and bonafide project work carried out by me under the supervision and guidance of Mrs. Megha .P.S,Asst.Professor, Department of Physics, Christ College (Autonomous), Irinjalakuda.

The information and data given in the report is authentic to the best of my knowledge. The report has not been previously submitted for the award of any Degree, Diploma, Associateship or other similar title of any other university or institute.

**Place: Irinjalakuda**

**SABIQ MAHMOOD**

**Date:**

**CCAVSPH048**

Submitted for the examination held on \_\_\_\_\_

INTERNAL EXAMINER

EXTERNAL EXAMINER

# ACKNOWLEDGEMENT

I express my eternal gratitude to the Almighty, under whose divine guidance, I was able to complete this work successfully.

I am grateful to our principal, Rev.Dr. Jolly Andrews CMI for providing us various facilities.

I also express my gratitude to Prof .V.P. Anto , Co-ordinator of the Department, for his encouragement and support for the preparation.

I express my gratitude to Mrs. Megha. P.S, Asst. Professor, whose guidance and support throughout the period helped me to complete this work successfully.

I am also thankful to all the faculties of the department for their interest and cooperation.

I extend my gratitude to the librarian and other library staffs of my college for their wholehearted cooperation.

I express my sincere thanks to my friends and family for their support in accomplishing this project.

**Place: Irinjalakuda**

**SABIQ MAHMOOD**

**Date:**



**“STUDY ON P3HT:PCBM ORGANIC SOLAR CELL”**

Project Report submitted to

**CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA**

In partial fulfilment of the requirement for the award of the degree of

**BACHELOR OF PHYSICS**

Submitted by

**SIYA SANTHOSH**

**(CCAVSPH049)**

Under the supervision of

**Asst.Prof JOSE SUNNY**



**DEPARTMENT OF PHYSICS**

**CHRIST COLLEGE (AUTONOMOUS), IRINJALAKUDA**

**UNIVERSITY OF CALICUT**

**MARCH 2024**

**CHRIST COLLEGE (AUTONOMOUS)  
IRINJALAKUDA  
UNIVERSITY OF CALICUT**



s

**DEPARTMENT OF PHYSICS CERTIFICATE**

This is to certify that the project report entitled “**STUDY ON P3HT: PCBM ORGANIC SOLAR CELL WITH AN ADDITIONAL POLYMER LAYER USING OGHMA NANO SOFTWARE**” is a bonafide record of project done by SIYA SANTHOSH, Reg. No. CCAVSPH049, under my guidance and supervision in partial fulfilment of the requirement for the award of the degree of BACHELOR OF PHYSICS and it has not previously formed the basis for any Degree, Diploma and Associateship or Fellowship.

Prof. V.P Anto  
Co-ordinator

Asst Prof .Jose Sunny  
Project Guide

## DECLARATION

I **SIYA SANTHOSH**, hereby declare that the project work entitled “**Study of P3HT:PCBM Organic Solar Cell**” is recorded of independent and bonafide project work carried out by Me under the supervision and guidance of Mr. Jos Sunny, Asst. Professor, Department of Physics, Christ College Autonomous Irinjalakuda.

The information and data given in the report is authentic to the best of my knowledge .The report has not been previously submitted for the award of any Degree , Diploma , Associateship or other similar tile of any other university or institute

Place :

SIYA SANTHOSH

Date:

CCAVSPH049

Submitted for the examination held on :

Internal Examiner :

External Examiner:

## ACKNOWLEDGEMENT

I would like to take the opportunity to express my preferred thanks and gratitude to all people who have helped me with sound advice and able guidance

Above all, I express my eternal gratitude to lord almighty under whose divine guidance; I have been able to complete this work successfully.

I would like to express my sincere obligation to Rev. DR. Jolly Andrews CMI, our principal for providing various facilities.

I am thankful to Prof . V.P Anto coordinator of Department for providing proper help and encouragement in the preparation of this report.

I express my sincere gratitude to Mr. Jose Sunny , Asst. Professor on contract , whose guidance and support throughout the period helped me to complete this work successfully .

I would like to express my preferred gratitude to all faculties of the Department for their interest and cooperation in this regard

I extend my hearty gratitude to the Librarian and the Library staffs of my college for their whole hearted cooperation.

I express my sincere thanks to my friends and family for their support in completing this report successfully.

Place:

SIYA SANTHOSH

Date:

CCAVSPH049

# **“Familiarization of Seebeck Effect and Characteristic Study of Peltier Module”**

A project report submitted to

**CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA**

*In partial fulfilment of the requirement for the award of the degree of*

**BACHELOR OF PHYSICS**

Submitted by

**ANGEL P. A  
(CCAVSPH051)**

Under the supervision of

**Aswathi P V**



**Department of Physics**

**CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA**

**UNIVERSITY OF CALICUT**

**MARCH 2024**



## DEPARTMENT OF PHYSICS CERTIFICATE

This is to certify that the project report entitled “**Familiarization of Seebeck Effect and Characteristic Study of Peltier Module**” is a bonafide record of project done by ANGEL P. A Reg. No. CCAVSPH051, under my guidance and supervision in partial fulfilment of the requirement for the award of the degree of BACHELOR OF PHYSICS and it has not previously formed the basis for any Degree, Diploma and Associateship or Fellowship.

Prof. V.P Anto

Co-ordinator

Submitted for the examination held on :

Internal Examiner :

Aswathi PV

Project Guide

External Examiner:

## **DECLARATION**

I ANGEL P. A hereby declare that the project work entitled **“Familiarization of Seebeck Effect and Characteristic Study of Peltier Module”** is recorded of independent and bonafide project work carried out by Me under the supervision and guidance of Aswathi P.V, Asst. Professor, Department of Physics , Christ College Autonomous Irinjalakuda.

The information and data given in the report is authentic to the best of my knowledge. The report has not been previously submitted for the award of any Degree, Diploma, Associateship or other similar tile of any other university or institute

Place: Irinjalakuda

Date: 25/03/2024

ANGEL P.A

CCAVSPH051

## **ACKNOWLEDGEMENT**

I would like to take the opportunity to express my preferred thanks and gratitude to all people who have helped me with sound advise and able guidance

Above all , I express my eternal gratitude to lord almighty under whose divine guidance ; I have been able to complete this work successfully .

I would like to express my sincere obligation to Rev. DR. Jolly Andrews CMI , our principal for providing various facilities.

Im thankful to Prof . V.P Anto coordinator of Department for providing proper help and encouragement in the preparation of this report.

I express my sincere gratitude to Mrs. Aswathy P.V, Asst. Professor on contract , whose guidance and support throughout the period helped me to complete this work successfully .

I would like to express my preferred gratitude to all faculties especially Dr. V.P Joseph and Mr. Jose Sunny of the Department for their interest and cooperation in this regard

I ex tend my hearty gratitude to the Librarian and the Library staffs of my college for their whole hearted cooperation.

I express my sincere thanks to my friends and family for their support in completing this report successfully.

Place:IRINJALAKUDA

ANGEL P. A

Date: 25/03/2024

CCAVSPH051



# **“Smart IoT Irrigation System”**

Project Report submitted to

**CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA**

*In partial fulfilment of the requirement for the award of the degree of*

**BACHELOR OF PHYSICS**

Submitted by

**EDWIN C DENNY**

**(CCAVSPH053)**

Under the supervision of

**Asst.Prof.Megha P S**



**DEPARTMENT OF PHYSICS**

**CHRIST COLLEGE (AUTONOMOUS), IRINJALAKUDA**

**UNIVERSITY OF CALICUT**

**MARCH 2024**

**CHRIST COLLEGE (AUTONOMOUS), IRINJALAKUDA  
CALICUT UNIVERSITY**



**DEPARTMENT OF PHYSICS CERTIFICATE**

This is to certify that the project report entitled “**Smart IoT Irrigation System**” is a bonafide record of project done by **EDWIN C DENNY**, Reg.No. CCAVSPH053, under my guidance and supervision in partial fulfilment of the requirement for the award of the degree of BACHELOR OF PHYSICS and it has not previously formed the basis for any Degree, Diploma and Associateship or Fellowship.

**Prof.V.P.Anto**

**Asst.Prof. Megha. P.S**

**Co-ordinator**

**Project guide**

## **DECLARATION**

I, **EDWIN C DENNY**, hereby declare that the project work entitled “**Smart IoT Irrigation System**” is a record of independent and bonafide project work carried out by me under the supervision and guidance of Mrs. Megha .P.S, Asst. Professor, Department of Physics, Christ College (Autonomous), Irinjalakuda.

The information and data given in the report is authentic to the best of my knowledge. The report has not been previously submitted for the award of any Degree, Diploma, Associateship or other similar title of any other university or institute.

**Place: Irinjalakuda**

**EDWIN C DENNY**

**Date:**

**CCAVSPH053**

Submitted for the examination held on \_\_\_\_\_

INTERNAL EXAMINER

EXTERNAL EXAMINER

# ACKNOWLEDGEMENT

I express my eternal gratitude to the Almighty, under whose divine guidance, I was able to complete this work successfully.

I am grateful to our principal, Rev.Dr. Jolly Andrews CMI for providing us various facilities.

I also express my gratitude to Prof .V.P. Anto , Co-ordinator of the Department, for his encouragement and support for the preparation.

I express my gratitude to Mrs. Megha. P.S, Asst. Professor, whose guidance and support throughout the period helped me to complete this work successfully.

I am also thankful to all the faculties of the department for their interest and cooperation.

I extend my gratitude to the librarian and other library staffs of my college for their wholehearted cooperation.

I express my sincere thanks to my friends and family for their support in accomplishing this project.

**Place: Irinjalakuda**

**EDWIN C DENNY**

**Date:**

**“STUDY ON P3HT:PCBM ORGANIC SOLAR CELL”**

Project Report submitted to

**CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA**

In partial fulfilment of the requirement for the award of the degree

of

**BACHELOR OF PHYSICS**

Submitted by

**NANDANA VINOD**

**(CCAVSPH055)**

Under the supervision of

**Asst.Prof JOSE SUNNY**



**DEPARTMENT OF PHYSICS**

**CHRIST COLLEGE (AUTONOMOUS), IRINJALAKUDA**

**UNIVERSITY OF CALICUT**

**MARCH 2024**

**CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA**

**UNIVERSITY OF CALICUT**



S

**DEPARTMENT OF PHYSICS CERTIFICATE**

This is to certify that the project report entitled “ **STUDY ON P3HT: PCBM ORGANIC SOLAR CELL WITH AN ADDITIONAL POLYMER LAYER USING OGHMA NANO SOFTWARE**” is a bonafide record of project done by NANDANA VINOD, Reg. No. CCAVSPH055, under my guidance and supervision in partial fulfilment of the requirement for the award of the degree of BACHELOR OF PHYSICS and it has not previously formed the basis for any Degree, Diploma and Associateship or Fellowship.

Prof. V.P Anto

Asst Prof .Jose Sunny

Co-ordinator

Project Guide

## DECLARATION

I **NANDANA VINOD**, hereby declare that the project work entitled “ **Study of P3HT:PCBM Organic Solar Cell**” is recorded of independent and bonafide project work carried out by Me under the supervision and guidance of Mr. Jos Sunny, Asst. Professor, Department of Physics, Christ College Autonomous Irinjalakuda.

The information and data given in the report is authentic to the best of my knowledge .The report has not been previously submitted for the award of any Degree , Diploma , Associateship or other similar tile of any other university or institute

Place :

NANDANA VINOD

Date:

CCAVSPH055

Submitted for the examination held on :

Internal Examiner :

External Examiner:



## ACKNOWLEDGEMENT

I would like to take the opportunity to express my preferred thanks and gratitude to all people who have helped me with sound advice and able guidance

Above all, I express my eternal gratitude to lord almighty under whose divine guidance; I have been able to complete this work successfully.

I would like to express my sincere obligation to Rev. DR. Jolly Andrews CMI, our principal for providing various facilities.

I am thankful to Prof . V.P Anto coordinator of Department for providing proper help and encouragement in the preparation of this report.

I express my sincere gratitude to Mr. Jose Sunny , Asst. Professor on contract , whose guidance and support throughout the period helped me to complete this work successfully .

I would like to express my preferred gratitude to all faculties of the Department for their interest and cooperation in this regard

I extend my hearty gratitude to the Librarian and the Library staffs of my college for their whole hearted cooperation.

I express my sincere thanks to my friends and family for their support in completing this report successfully.

Place:

NANDANA VINOD

**“Development of 'Ampere', an electricity bill calculation app and analysis of Domestic Electricity Consumption using python software”**

A project report submitted to

**CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA**

*In partial fulfillment of the requirement for the award of the degree of*

**BACHELOR OF PHYSICS**

Submitted by

**SANDRA P VINOD  
(CCA VSPH057)**

Under the supervision of  
**MS. ANJALI JOBY**



**Department of Physics  
CHRIST COLLEGE (AUTONOMOUS), IRINJALAKUDA  
UNIVERSITY OF CALICUT**

**MARCH 2024**

**CHRIST COLLEGE (AUTONOMOUS)**

**IRINJALAKUDA**

**UNIVERSITY OF CALICUT**

**MARCH 2024**



**DEPARTMENT OF PHYSICS CERTIFICATE**

This is to certify that the project report entitled “**Development of 'Ampere', an electricity bill calculation app and analysis of Domestic Electricity Consumption using python software**” is a bonafide record of project done by SANDRA P VINOD, Reg. No. CCAVSPH057, under my guidance and supervision in partial fulfilment of the requirement for the award of the degree of BACHELOR OF PHYSICS and it has not previously formed the basis for any Degree, Diploma and Associateship or Fellowship.

Prof. V.P Anto  
Co-ordinator

Ms. Anjali joby  
Project Guide

Submitted for the examination held on :

Internal Examiner :

External Examiner:

# DECLARATION

I SANDRA P VINOD. hereby declare that the project work entitled “**Development of 'Ampere', an electricity bill calculation app and analysis of Domestic Electricity Consumption using python software**” is recorded of independent and bonafide project work carried out by Me under the supervision and guidance of Ms. Anjali joby, Asst. Professor, Department of Physics , Christ College Autonomous Irinjalakuda.

The information and data given in the report is authentic to the best of my knowledge. The report has not been previously submitted for the award of any Degree, Diploma, Associateship or other similar tile of any other university or institute

Place: Irinjalakuda

Date: 25/03/2024

SANDRA P VINOD

CCAVSPH057

# ACKNOWLEDGEMENT

I would like to take the opportunity to express my preferred thanks and gratitude to all people who have helped me with sound advice and able guidance  
Above all , I express my eternal gratitude to lord almighty under whose divine guidance ;  
I have been able to complete this work successfully .

I would like to express my sincere obligation to Rev. DR. Jolly Andrews CMI , our principal for providing various facilities.

Im thankful to Prof . V.P Anto coordinator of Department for providing proper help and encouragement in the preparation of this report.

I express my sincere gratitude to Ms. Anjali joby , Asst. Professor on contract , whose guidance and support throughout the period helped me to complete this work successfully

I would like to express my preferred gratitude to all faculties especially Dr. V.P Joseph and Mr. Jose Sunny of the Department for their interest and cooperation in this regard  
I ex tend my hearty gratitude to the Librarian and the Library staffs of my college for their whole hearted cooperation.

I express my sincere thanks to my friends and family for their support in completing this report successfully.

Place:IRINJALAKUDA

Date: 25/03/2024

SANDRA P VINOD

CCAVSPH057

**“STUDY ON P3HT:PCBM ORGANIC SOLAR CELL”**

Project Report submitted to

**CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA**

In partial fulfilment of the requirement for the award of the degree of

**BACHELOR OF PHYSICS**

Submitted by

**AJAL K.P**

**(CCAVSPH061)**

Under the supervision of

**Asst.Prof JOSE SUNNY**



**DEPARTMENT OF PHYSICS**

**CHRIST COLLEGE (AUTONOMOUS), IRINJALAKUDA**

**UNIVERSITY OF CALICUT**

**MARCH 2024**

**CHRIST COLLEGE (AUTONOMOUS)**  
**IRINJALAKUDA**  
**UNIVERSITY OF CALICUT**



s

**DEPARTMENT OF PHYSICS CERTIFICATE**

This is to certify that the project report entitled “**STUDY ON P3HT: PCBM ORGANIC SOLAR CELL WITH AN ADDITIONAL POLYMER LAYER USING OGHMA NANO SOFTWARE**” is a bonafide record of project done by AJAL K.P, Reg. No. CCAVSPH061, under my guidance and supervision in partial fulfilment of the requirement for the award of the degree of BACHELOR OF PHYSICS and it has not previously formed the basis for any Degree, Diploma and Associateship or Fellowship.

Prof. V.P Anto

Co-ordinator

Asst Prof .Jose Sunny

Project Guide

## DECLARATION

I **AJAL K.P**, hereby declare that the project work entitled “**Study of P3HT:PCBM Organic Solar Cell**” is recorded of independent and bonafide project work carried out by Me under the supervision and guidance of Mr. Jos Sunny, Asst. Professor, Department of Physics, Christ College Autonomous Irinjalakuda.

The information and data given in the report is authentic to the best of my knowledge .The report has not been previously submitted for the award of any Degree , Diploma , Associateship or other similar tile of any other university or institute

Place :

AJAL K.P

Date:

CCAVSPH061

Submitted for the examination held on :

Internal Examiner :

External Examiner:



## ACKNOWLEDGEMENT

I would like to take the opportunity to express my preferred thanks and gratitude to all people who have helped me with sound advice and able guidance

Above all, I express my eternal gratitude to lord almighty under whose divine guidance; I have been able to complete this work successfully.

I would like to express my sincere obligation to Rev. DR. Jolly Andrews CMI, our principal for providing various facilities.

Iam thankful to Prof . V.P Anto coordinator of Department for providing proper help and encouragement in the preparation of this report.

I express my sincere gratitude to Mr. Jose Sunny , Asst. Professor on contract , whose guidance and support throughout the period helped me to complete this work successfully .

I would like to express my preferred gratitude to all faculties of the Department for their interest and cooperation in this regard

I ex tend my heartly gratitude to the Librarian and the Library staffs of my college for their whole hearted cooperation.

I express my sincere thanks to my friends and family for their support in completing this report successfully.

Place:

AJAL K.P

Date:

CCAVSPH061

# **“Smart IoT Irrigation System”**

Project Report submitted to

**CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA**

*In partial fulfilment of the requirement for the award of the degree of*

**BACHELOR OF PHYSICS**

Submitted by

**ALISHA JOY**

**(CCAVSPH063)**

Under the supervision of

**Asst.Prof.Megha P S**



**DEPARTMENT OF PHYSICS**

**CHRIST COLLEGE (AUTONOMOUS), IRINJALAKUDA**

**UNIVERSITY OF CALICUT**

**MARCH 2024**

**CHRIST COLLEGE (AUTONOMOUS), IRINJALAKUDA  
CALICUT UNIVERSITY**



**DEPARTMENT OF PHYSICS CERTIFICATE**

This is to certify that the project report entitled “**Smart IoT Irrigation System**” is a bonafide record of project done by **ALISHA JOY**, Reg.No. CCAVSPH063, under my guidance and supervision in partial fulfilment of the requirement for the award of the degree of BACHELOR OF PHYSICS and it has not previously formed the basis for any Degree, Diploma and Associateship or Fellowship.

**Prof.V.P.Anto**

**Asst.Prof. Megha. P.S**

**Co-ordinator**

**Project guide**

## **DECLARATION**

I, **ALISHA JOY**, hereby declare that the project work entitled “**Smart IoT Irrigation System**” is a record of independent and bonafide project work carried out by me under the supervision and guidance of Mrs. Megha .P.S,Asst.Professor, Department of Physics, Christ College (Autonomous), Irinjalakuda.

The information and data given in the report is authentic to the best of my knowledge. The report has not been previously submitted for the award of any Degree, Diploma, Associateship or other similar title of any other university or institute.

**Place: Irinjalakuda**

**ALISHA JOY**

**Date:**

**CCAVSPH063**

Submitted for the examination held on \_\_\_\_\_

INTERNAL EXAMINER

EXTERNAL EXAMINER

# ACKNOWLEDGEMENT

I express my eternal gratitude to the Almighty, under whose divine guidance, I was able to complete this work successfully.

I am grateful to our principal, Rev.Dr. Jolly Andrews CMI for providing us various facilities.

I also express my gratitude to Prof .V.P. Anto , Co-ordinator of the Department, for his encouragement and support for the preparation.

I express my gratitude to Mrs. Megha. P.S, Asst. Professor, whose guidance and support throughout the period helped me to complete this work successfully.

I am also thankful to all the faculties of the department for their interest and cooperation.

I extend my gratitude to the librarian and other library staffs of my college for their wholehearted cooperation.

I express my sincere thanks to my friends and family for their support in accomplishing this project.

**Place: Irinjalakuda**

**ALISHA JOY**

**Date:**

# **“Development of 'Ampere', an electricity bill calculation app and analysis of Domestic Electricity Consumption using python software”**

A project report submitted to

**CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA**

*In partial fulfillment of the requirement for the award of the degree of*

**BACHELOR OF PHYSICS**

Submitted by

**HENJO HENRY  
(CCAVSPH065)**

Under the supervision of  
**MS. ANJALI JOBY**



**Department of Physics  
CHRIST COLLEGE (AUTONOMOUS), IRINJALAKUDA  
UNIVERSITY OF CALICUT**

**MARCH 2024**

**CHRIST COLLEGE (AUTONOMOUS)**

**IRINJALAKUDA**

**UNIVERSITY OF CALICUT**

**MARCH 2024**



**DEPARTMENT OF PHYSICS CERTIFICATE**

This is to certify that the project report entitled “**Development of 'Ampere', an electricity bill calculation app and analysis of Domestic Electricity Consumption using python software**” is a bonafide record of project done by HENJO HENRY , Reg. No. CCAVSPH065, under my guidance and supervision in partial fulfilment of the requirement for the award of the degree of BACHELOR OF PHYSICS and it has not previously formed the basis for any Degree, Diploma and Associateship or Fellowship.

Prof. V.P Anto  
Co-ordinator

Ms. Anjali joby  
Project Guide

Submitted for the examination held on :

Internal Examiner :

External Examiner:

# DECLARATION

I HENJO HENRY . hereby declare that the project work entitled “**Development of 'Ampere', an electricity bill calculation app and analysis of Domestic Electricity Consumption using python software**” is recorded of independent and bonafide project work carried out by Me under the supervision and guidance of Ms. Anjali joby, Asst. Professor, Department of Physics , Christ College Autonomous Irinjalakuda. The information and data given in the report is authentic to the best of my knowledge. The report has not been previously submitted for the award of any Degree, Diploma, Associateship or other similar tile of any other university or institute

Place: Irinjalakuda

Date: 25/03/2024

HENJO HENRY

CCAVSPH065



# ACKNOWLEDGEMENT

I would like to take the opportunity to express my preferred thanks and gratitude to all people who have helped me with sound advice and able guidance

Above all , I express my eternal gratitude to lord almighty under whose divine guidance ;

I have been able to complete this work successfully .

I would like to express my sincere obligation to Rev. DR. Jolly Andrews CMI , our principal for providing various facilities.

Im thankful to Prof. V.P Anto coordinator of Department for providing proper help and encouragement in the preparation of this report.

I express my sincere gratitude to Ms. Anjali joby , Asst. Professor on contract , whose guidance and support throughout the period helped me to complete this work successfully

I would like to express my preferred gratitude to all faculties especially Dr. V.P Joseph and Mr. Jose Sunny of the Department for their interest and cooperation in this regard I extend my heartly gratitude to the Librarian and the Library staffs of my college for their whole hearted cooperation.

I express my sincere thanks to my friends and family for their support in completing this report successfully.

Place:IRINJALAKUDA

Date: 25/03/2024

HENJO HENRY

CCAVSPH065

# **“Familiarization of Seebeck Effect and Characteristic Study of Peltier Module”**

A project report submitted to

**CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA**

*In partial fulfilment of the requirement for the award of the degree of*

**BACHELOR OF PHYSICS**

Submitted by

**NAVYA BHAVAL . C**

**(CCAVSPH067)**

Under the supervision of

**Aswathi P V**



**Department of Physics**

**CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA**

**UNIVERSITY OF CALICUT**

**MARCH 2024**



## DEPARTMENT OF PHYSICS CERTIFICATE

This is to certify that the project report entitled “**Familiarization of Seebeck Effect and Characteristic Study of Peltier Module**” is a bonafide record of project done by NAVYA BHAVAL . C Reg. No. CCAVSPH067, under my guidance and supervision in partial fulfilment of the requirement for the award of the degree of BACHELOR OF PHYSICS and it has not previously formed the basis for any Degree, Diploma and Associateship or Fellowship.

Prof. V.P Anto

Co-ordinator

Submitted for the examination held on :

Internal Examiner :

Aswathi PV

Project Guide

External Examiner:

## **DECLARATION**

I NAVYA BHAVAL. C hereby declare that the project work entitled **“Familiarization of Seebeck Effect and Characteristic Study of Peltier Module”** is recorded of independent and bonafide project work carried out by Me under the supervision and guidance of Aswathi P.V, Asst. Professor, Department of Physics , Christ College Autonomous Irinjalakuda.

The information and data given in the report is authentic to the best of my knowledge. The report has not been previously submitted for the award of any Degree, Diploma, Associateship or other similar tile of any other university or institute

Place: Irinjalakuda

Date: 25/03/2024

NAVYA BHAVAL . C

CCAVSPH067

## **ACKNOWLEDGEMENT**

I would like to take the opportunity to express my preferred thanks and gratitude to all people who have helped me with sound advise and able guidance

Above all , I express my eternal gratitude to lord almighty under whose divine guidance ; I have been able to complete this work successfully .

I would like to express my sincere obligation to Rev. DR. Jolly Andrews CMI , our principal for providing various facilities.

Im thankful to Prof . V.P Anto coordinator of Department for providing proper help and encouragement in the preparation of this report.

I express my sincere gratitude to Mrs. Aswathy P.V, Asst. Professor on contract , whose guidance and support throughout the period helped me to complete this work successfully .

I would like to express my preferred gratitude to all faculties especially Dr. V.P Joseph and Mr. Jose Sunny of the Department for their interest and cooperation in this regard

I ex tend my hearty gratitude to the Librarian and the Library staffs of my college for their whole hearted cooperation.

I express my sincere thanks to my friends and family for their support in completing this report successfully.

Place:IRINJALAKUDA

NAVYA BHAVAL . C

Date: 25/03/2024

CCAVSPH067

# **“Smart IoT Irrigation System”**

Project Report submitted to

**CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA**

*In partial fulfilment of the requirement for the award of the degree of*

**BACHELOR OF PHYSICS**

Submitted by

**ROHITH TV**

**(CCA VSPH068)**

Under the supervision of

**Asst.Prof.Megha P S**



**DEPARTMENT OF PHYSICS**

**CHRIST COLLEGE (AUTONOMOUS), IRINJALAKUDA**

**UNIVERSITY OF CALICUT**

**MARCH 2024**

**CHRIST COLLEGE (AUTONOMOUS), IRINJALAKUDA  
CALICUT UNIVERSITY**



**DEPARTMENT OF PHYSICS CERTIFICATE**

This is to certify that the project report entitled “**Smart IoT Irrigation System**” is a bonafide record of project done by **ROHITH TV**, Reg.No. CCAVSPH068, under my guidance and supervision in partial fulfilment of the requirement for the award of the degree of BACHELOR OF PHYSICS and it has not previously formed the basis for any Degree, Diploma and Associateship or Fellowship.

**Prof.V.P.Anto**

**Asst.Prof. Megha. P.S**

**Co-ordinator**

**Project guide**

## **DECLARATION**

I, **ROHITH TV**, hereby declare that the project work entitled “**Smart IoT Irrigation System**” is a record of independent and bonafide project work carried out by me under the supervision and guidance of Mrs. Megha .P.S, Asst. Professor, Department of Physics, Christ College (Autonomous), Irinjalakuda.

The information and data given in the report is authentic to the best of my knowledge. The report has not been previously submitted for the award of any Degree, Diploma, Associateship or other similar title of any other university or institute.

**Place: Irinjalakuda**

**ROHITH TV**

**Date:**

**CCA VSPH068**

Submitted for the examination held on \_\_\_\_\_

INTERNAL EXAMINER

EXTERNAL EXAMINER



# ACKNOWLEDGEMENT

I express my eternal gratitude to the Almighty, under whose divine guidance, I was able to complete this work successfully.

I am grateful to our principal, Rev.Dr. Jolly Andrews CMI for providing us various facilities.

I also express my gratitude to Prof .V.P. Anto , Co-ordinator of the Department, for his encouragement and support for the preparation.

I express my gratitude to Mrs. Megha. P.S, Asst. Professor, whose guidance and support throughout the period helped me to complete this work successfully.

I am also thankful to all the faculties of the department for their interest and cooperation.

I extend my gratitude to the librarian and other library staffs of my college for their wholehearted cooperation.

I express my sincere thanks to my friends and family for their support in accomplishing this project.

**Place: Irinjalakuda**

**ROHITH TV**

**Date:**

# SMART IoT IRRIGATION SYSTEM

# **“Development of 'Ampere', an electricity bill calculation app and analysis of Domestic Electricity Consumption using python software”**

A project report submitted to

**CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA**

*In partial fulfillment of the requirement for the award of the degree of*

**BACHELOR OF PHYSICS**

Submitted by

**SUJITHA V S  
(CCAVSPH070 )**

Under the supervision of  
**MS. ANJALI JOBY**



**Department of Physics  
CHRIST COLLEGE (AUTONOMOUS), IRINJALAKUDA  
UNIVERSITY OF CALICUT**

**MARCH 2024**

**CHRIST COLLEGE (AUTONOMOUS)**

**IRINJALAKUDA**

**UNIVERSITY OF CALICUT**

**MARCH 2024**



**DEPARTMENT OF PHYSICS CERTIFICATE**

This is to certify that the project report entitled “**Development of 'Ampere', an electricity bill calculation app and analysis of Domestic Electricity Consumption using python software**” is a bonafide record of project done by **SUJITHA V S** , Reg. No. **CCAVSPH070** , under my guidance and supervision in partial fulfilment of the requirement for the award of the degree of **BACHELOR OF PHYSICS** and it has not previously formed the basis for any Degree, Diploma and Associateship or Fellowship.

Prof. V.P Anto  
Co-ordinator

Ms. Anjali joby  
Project Guide

Submitted for the examination held on :

Internal Examiner :

External Examiner:

# DECLARATION

I SUJITHA V S . hereby declare that the project work entitled “**Development of 'Ampere', an electricity bill calculation app and analysis of Domestic Electricity Consumption using python software**” is recorded of independent and bonafide project work carried out by Me under the supervision and guidance of Ms. Anjali joby, Asst. Professor, Department of Physics , Christ College Autonomous Irinjalakuda. The information and data given in the report is authentic to the best of my knowledge. The report has not been previously submitted for the award of any Degree, Diploma, Associateship or other similar tile of any other university or institute

Place: Irinjalakuda

Date: 25/03/2024

SUJITHA V S

CCAVSPH070

# ACKNOWLEDGEMENT

I would like to take the opportunity to express my preferred thanks and gratitude to all people who have helped me with sound advice and able guidance

Above all , I express my eternal gratitude to lord almighty under whose divine guidance ;

I have been able to complete this work successfully .

I would like to express my sincere obligation to Rev. DR. Jolly Andrews CMI , our principal for providing various facilities.

Im thankful to Prof. V.P Anto coordinator of Department for providing proper help and encouragement in the preparation of this report.

I express my sincere gratitude to Ms. Anjali joby , Asst. Professor on contract , whose guidance and support throughout the period helped me to complete this work successfully

I would like to express my preferred gratitude to all faculties especially Dr. V.P Joseph and Mr. Jose Sunny of the Department for their interest and cooperation in this regard I extend my heartly gratitude to the Librarian and the Library staffs of my college for their whole hearted cooperation.

I express my sincere thanks to my friends and family for their support in completing this report successfully.

Place:IRINJALAKUDA

Date: 25/03/2024

SUJITHA V S

CCAVSPH070

**Development of 'Ampere', an electricity bill calculation app  
and analysis of Domestic Electricity Consumption using  
python software**

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**“SELF BALENCING PLATFORM”**

Project Report submitted to

**CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA**

In partial fulfilment of the requirement for the award of the degree of

**BACHELOR OF PHYSICS**

Submitted by  
**KIRAN K**

**(CCAVSPH066)**

Under the supervision of

**Asst.Prof.Simmy Nixon**



**DEPARTMENT OF PHYSICS**

**CHRIST COLLEGE (AUTONOMOUS), IRINJALAKUDA**

**UNIVERSITY OF CALICUT**

**MARCH 2024**

**CHRIST COLLEGE (AUTONOMOUS), IRINJALAKUDA**  
**CALICUT UNIVERSITY**



**DEPARTMENT OF PHYSICS CERTIFICATE**

This is to certify that the project report entitled “self balancing platform” is a bonafide record of project done by **KIRAN K**, Reg.No. CCAVSPH066, under my guidance and supervision in partial fulfilment of the requirement for the award of the degree of BACHELOR OF PHYSICS and it has not previously formed the basis for any Degree, Diploma and Associateship or Fellowship.

Prof.V.P.Anto

Co-ordinator

Asst.Prof. Simmy Nixon

Project guide

## DECLARARTION

I, **KIRAN K**, hereby declare that the project work entitled “self balancing platform” is a record of independent and bonafide project work carried out by me under the supervision and guidance of Mrs. Simmy Nixon ,Asst.Professor, Department of Physics, Christ College (Autonomous), Irinjalakuda.

The information and data given in the report is authentic to the best of my knowledge. The report has not been previously submitted for the award of any Degree, Diploma, Associateship or other similar title of any other university or institute.

Place: Irinjalakuda  
Date:

KIRAN K  
CCAVSPH066

Submitted for the examination held on\_\_\_\_\_

INTERNAL EXAMINER.

EXTERNAL EXAMINER

## ACKNOWLEDGEMENT

I express my eternal gratitude to the Almighty, under whose divine guidance, I was able to complete this work successfully.

I'm grateful to our principal, Rev.Dr. Jolly Andrews CMI for providing us various facilities.

I also express my gratitude to Prof .V.P. Anto , Co-ordinator of the Department, for his encouragement and support for the preparation.

I express my gratitude to Mrs. Simmy Nixon, Asst. Professor, whose guidance and support throughout the period helped me to complete this work successfully.

I'm also thankful to all the faculties of the department for their interest and cooperation.

I extend my gratitude to the librarian and other library staffs of my college for their wholehearted cooperation.

I express my sincere thanks to my friends and family for their support in accomplishing this project.

Place: Irinjalakuda

Date:

KIRAN K

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## APPENDIX A

# **“Development of 'Ampere', an electricity bill calculation app and analysis of Domestic Electricity Consumption using python software”**

A project report submitted to

**CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA**

*In partial fulfillment of the requirement for the award of the degree of*

**BACHELOR OF PHYSICS**

Submitted by

**ADHWAITH NARAYAN K N  
(CCAVSPH060)**

Under the supervision of  
**MS. ANJALI JOBY**



**Department of Physics  
CHRIST COLLEGE (AUTONOMOUS), IRINJALAKUDA  
UNIVERSITY OF CALICUT**

**MARCH 2024**

**CHRIST COLLEGE (AUTONOMOUS)**

**IRINJALAKUDA**

**UNIVERSITY OF CALICUT**

**MARCH 2024**



**DEPARTMENT OF PHYSICS CERTIFICATE**

This is to certify that the project report entitled “**Development of 'Ampere', an electricity bill calculation app and analysis of Domestic Electricity Consumption using python software**” is a bonafide record of project done by **ADHWAITH NARAYAN K N** , Reg. No. CCAVSPH060, under my guidance and supervision in partial fulfilment of the requirement for the award of the degree of **BACHELOR OF PHYSICS** and it has not previously formed the basis for any Degree, Diploma and Associateship or Fellowship.

Prof. V.P Anto  
Co-ordinator

Ms. Anjali joby  
Project Guide

Submitted for the examination held on :

Internal Examiner :

External Examiner:

# DECLARATION

I ADHWAITH NARAYAN K N . hereby declare that the project work entitled **“Development of 'Ampere', an electricity bill calculation app and analysis of Domestic Electricity Consumption using python software”** is recorded of independent and bonafide project work carried out by Me under the supervision and guidance of Ms. Anjali joby, Asst. Professor, Department of Physics , Christ College Autonomous Irinjalakuda.

The information and data given in the report is authentic to the best of my knowledge. The report has not been previously submitted for the award of any Degree, Diploma, Associateship or other similar tile of any other university or institute

Place: Irinjalakuda

Date: 25/03/2024

ADHWAITH NARAYAN K N

CCAVSPH060



# ACKNOWLEDGEMENT

I would like to take the opportunity to express my preferred thanks and gratitude to all people who have helped me with sound advice and able guidance

Above all , I express my eternal gratitude to lord almighty under whose divine guidance ;  
I have been able to complete this work successfully .

I would like to express my sincere obligation to Rev. DR. Jolly Andrews CMI , our principal for providing various facilities.

Im thankful to Prof. V.P Anto coordinator of Department for providing proper help and encouragement in the preparation of this report.

I express my sincere gratitude to Ms. Anjali joby , Asst. Professor on contract , whose guidance and support throughout the period helped me to complete this work successfully

I would like to express my preferred gratitude to all faculties especially Dr. V.P Joseph and Mr. Jose Sunny of the Department for their interest and cooperation in this regard  
I ex tend my hearty gratitude to the Librarian and the Library staffs of my college for their whole hearted cooperation.

I express my sincere thanks to my friends and family for their support in completing this report successfully.

Place:IRINJALAKUDA

Date: 25/03/2024

ADHWAITH NARAYAN K N  
CCAVSPH060

**“STUDY ON P3HT:PCBM ORGANIC SOLAR CELL”**

Project Report submitted to

**CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA**

In partial fulfilment of the requirement for the award of the degree

of

**BACHELOR OF PHYSICS**

Submitted by

**NANDANA VINOD**

**(CCAVSPH055)**

Under the supervision of

**Asst.Prof JOSE SUNNY**



**DEPARTMENT OF PHYSICS**

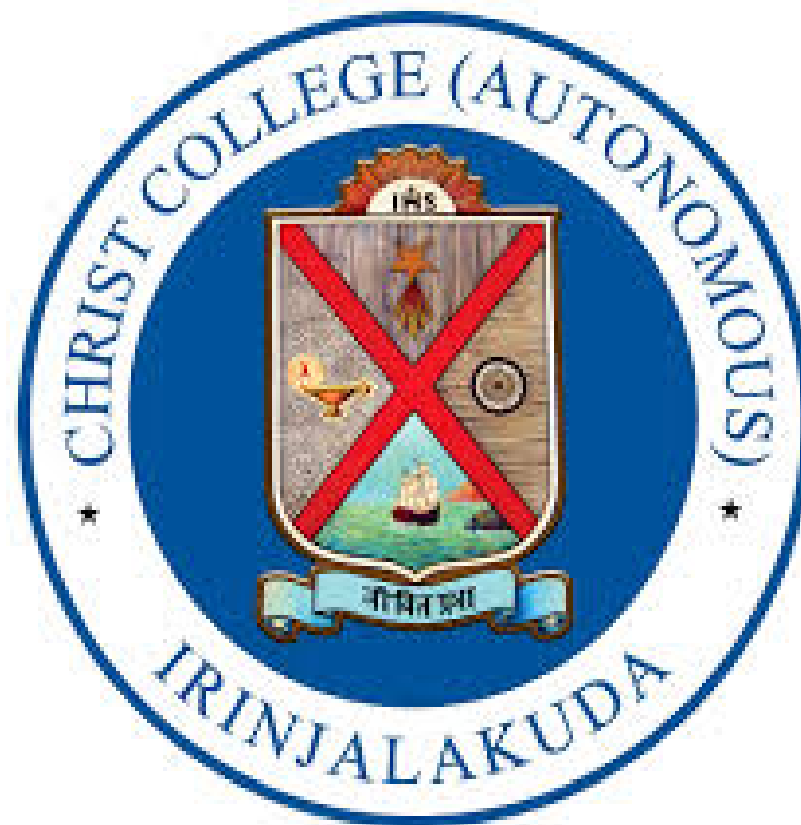
**CHRIST COLLEGE (AUTONOMOUS), IRINJALAKUDA**

**UNIVERSITY OF CALICUT**

**MARCH 2024**

**CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA**

**UNIVERSITY OF CALICUT**



S

**DEPARTMENT OF PHYSICS CERTIFICATE**

This is to certify that the project report entitled “ **STUDY ON P3HT: PCBM ORGANIC SOLAR CELL WITH AN ADDITIONAL POLYMER LAYER USING OGHMA NANO SOFTWARE**” is a bonafide record of project done by NANDANA VINOD, Reg. No. CCAVSPH055, under my guidance and supervision in partial fulfilment of the requirement for the award of the degree of BACHELOR OF PHYSICS and it has not previously formed the basis for any Degree, Diploma and Associateship or Fellowship.

Prof. V.P Anto

Asst Prof .Jose Sunny

Co-ordinator

Project Guide

## DECLARATION

I **NANDANA VINOD**, hereby declare that the project work entitled “ **Study of P3HT:PCBM Organic Solar Cell**” is recorded of independent and bonafide project work carried out by Me under the supervision and guidance of Mr. Jos Sunny, Asst. Professor, Department of Physics, Christ College Autonomous Irinjalakuda.

The information and data given in the report is authentic to the best of my knowledge .The report has not been previously submitted for the award of any Degree , Diploma , Associateship or other similar tile of any other university or institute

Place :

NANDANA VINOD

Date:

CCAVSPH055

Submitted for the examination held on :

Internal Examiner :

External Examiner:

## **ACKNOWLEDGEMENT**

I would like to take the opportunity to express my preferred thanks and gratitude to all people who have helped me with sound advice and able guidance

Above all, I express my eternal gratitude to lord almighty under whose divine guidance; I have been able to complete this work successfully.

I would like to express my sincere obligation to Rev. DR. Jolly Andrews CMI, our principal for providing various facilities.

I am thankful to Prof . V.P Anto coordinator of Department for providing proper help and encouragement in the preparation of this report.

I express my sincere gratitude to Mr. Jose Sunny , Asst. Professor on contract , whose guidance and support throughout the period helped me to complete this work successfully .

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I extend my hearty gratitude to the Librarian and the Library staffs of my college for their whole hearted cooperation.

I express my sincere thanks to my friends and family for their support in completing this report successfully.

Place:

NANDANA VINOD

# **“Familiarization of Seebeck Effect and Characteristic Study of Peltier Module”**

A project report submitted to

**CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA**

*In partial fulfilment of the requirement for the award of the degree of*

**BACHELOR OF PHYSICS**

Submitted by

**SHAUN SHOBY  
(CCAVSPH069)**

Under the supervision of

**Aswathi P V**



**Department of Physics**

**CHRIST COLLEGE AUTONOMOUS IRINJALAKUDA**

**UNIVERSITY OF CALICUT**

**CHRIST COLLEGE (AUTONOMOUS)**

**IRINJALAKUDA**

**UNIVERSITY OF CALICUT**

**MARCH 2024**



**DEPARTMENT OF PHYSICS CERTIFICATE**

This is to certify that the project report entitled “**Familiarization of Seebeck Effect and Characteristic Study of Peltier Module**” is a bonafide record of project done by SHAUN SHOBY , Reg. No. CCAVSPH069, under my guidance and supervision in partial fulfilment of the requirement for the award of the degree of BACHELOR OF PHYSICS and it has not previously formed the basis for any Degree, Diploma and Associateship or Fellowship.

Prof. V.P Anto

Co-ordinator

Submitted for the examination held on :

Internal Examiner :

Aswathi PV

Project Guide

External Examiner:



## DECLARATION

I SHAUN SHOBY hereby declare that the project work entitled “**Familiarization of Seebeck Effect and Characteristic Study of Peltier Module**” is recorded of independent and bonafide project work carried out by Me under the supervision and guidance of Aswathi P.V, Asst. Professor, Department of Physics , Christ College Autonomous Irinjalakuda.

The information and data given in the report is authentic to the best of my knowledge. The report has not been previously submitted for the award of any Degree, Diploma, Associateship or other similar title of any other university or institute

Place: Irinjalakuda

Date: 25/03/2024

SHAUN SHOBY

CCAVSPH069

## ACKNOWLEDGEMENT

I would like to take the opportunity to express my preferred thanks and gratitude to all people who have helped me with sound advise and able guidance

Above all , I express my eternal gratitude to lord almighty under whose divine guidance ; I have been able to complete this work successfully .

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I express my sincere thanks to my friends and family for their support in completing this report successfully.

Place:IRINJALAKUDA

Date: 25/03/2024

SHAUN SHOBY

CCAVSPH069

**“FAMILIARIZATION OF SEEBECK EFFECT AND  
CHARACTERISTIC STUDY OF PELTIER  
MODULE”**

# **“Familiarization of Seebeck Effect and Characteristic Study of Peltier Module”**

A project report submitted to

**CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA**

*In partial fulfilment of the requirement for the award of the degree of*

**BACHELOR OF PHYSICS**

Submitted by

**ADITHYA M M**

**(CCAVSPH041)**

Under the supervision of

**Aswathi P V**



**Department of Physics**

**CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA**

**UNIVERSITY OF CALICUT**

**MARCH 2024**



## DEPARTMENT OF PHYSICS CERTIFICATE

This is to certify that the project report entitled “**Familiarization of Seebeck Effect and Characteristic Study of Peltier Module**” is a bonafide record of project done by ADITHYA M M Reg. No. CCAVSPH041, under my guidance and supervision in partial fulfilment of the requirement for the award of the degree of BACHELOR OF PHYSICS and it has not previously formed the basis for any Degree, Diploma and Associateship or Fellowship.

Prof. V.P Anto

Co-ordinator

Submitted for the examination held on :

Internal Examiner :

Aswathi PV

Project Guide

External Examiner:

## **DECLARATION**

I ADITHYA M M hereby declare that the project work entitled **“Familiarization of Seebeck Effect and Characteristic Study of Peltier Module”** is recorded of independent and bonafide project work carried out by Me under the supervision and guidance of Aswathi P.V, Asst. Professor, Department of Physics , Christ College Autonomous Irinjalakuda.

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Place: Irinjalakuda

Date: 25/03/2024

ADITHYA M M

CCAVSPH041

## **ACKNOWLEDGEMENT**

I would like to take the opportunity to express my preferred thanks and gratitude to all people who have helped me with sound advise and able guidance

Above all , I express my eternal gratitude to lord almighty under whose divine guidance ; I have been able to complete this work successfully .

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I express my sincere thanks to my friends and family for their support in completing this report successfully.

Place:IRINJALAKUDA

ADITHYA M M

Date: 25/03/2024

CCAVSPH041

# **“Development of 'Ampere', an electricity bill calculation app and analysis of Domestic Electricity Consumption using python software”**

A project report submitted to

**CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA**

*In partial fulfillment of the requirement for the award of the degree of*

**BACHELOR OF PHYSICS**

Submitted by

**ANEENA BERLIN  
(CCAVSPH043)**

Under the supervision of  
**MS. ANJALI JOBY**



**Department of Physics  
CHRIST COLLEGE (AUTONOMOUS), IRINJALAKUDA  
UNIVERSITY OF CALICUT**

**MARCH 2024**



**CHRIST COLLEGE (AUTONOMOUS)**

**IRINJALAKUDA**

**UNIVERSITY OF CALICUT**

**MARCH 2024**



**DEPARTMENT OF PHYSICS CERTIFICATE**

This is to certify that the project report entitled “**Development of 'Ampere', an electricity bill calculation app and analysis of Domestic Electricity Consumption using python software**” is a bonafide record of project done by ANEENA BERLIN , Reg. No. CCAVSPH043, under my guidance and supervision in partial fulfilment of the requirement for the award of the degree of BACHELOR OF PHYSICS and it has not previously formed the basis for any Degree, Diploma and Associateship or Fellowship.

Prof. V.P Anto  
Co-ordinator

Ms. Anjali joby  
Project Guide

Submitted for the examination held on :

Internal Examiner :

External Examiner:

# DECLARATION

I ANEENABERLIN . hereby declare that the project work entitled “**Development of 'Ampere', an electricity bill calculation app and analysis of Domestic Electricity Consumption using python software**” is recorded of independent and bonafide project work carried out by Me under the supervision and guidance of Ms. Anjali joby, Asst. Professor, Department of Physics , Christ College Autonomous Irinjalakuda. The information and data given in the report is authentic to the best of my knowledge. The report has not been previously submitted for the award of any Degree, Diploma, Associateship or other similar tile of any other university or institute

Place: Irinjalakuda

Date: 25/03/2024

ANEENA BERLIN

CCAVSPH043

# ACKNOWLEDGEMENT

I would like to take the opportunity to express my preferred thanks and gratitude to all people who have helped me with sound advice and able guidance

Above all , I express my eternal gratitude to lord almighty under whose divine guidance ;

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I would like to express my preferred gratitude to all faculties especially Dr. V.P Joseph and Mr. Jose Sunny of the Department for their interest and cooperation in this regard I extend my heartly gratitude to the Librarian and the Library staffs of my college for their whole hearted cooperation.

I express my sincere thanks to my friends and family for their support in completing this report successfully.

Place:IRINJALAKUDA

Date: 25/03/2024

ANEENA BERLIN

CCAVSPH043

# **“Smart IoT Irrigation System”**

Project Report submitted to

**CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA**

*In partial fulfilment of the requirement for the award of the degree of*

**BACHELOR OF PHYSICS**

Submitted by

**ATHIRA V**

**(CCAVSPH044)**

Under the supervision of

**Asst.Prof.Megha P S**



**DEPARTMENT OF PHYSICS**

**CHRIST COLLEGE (AUTONOMOUS), IRINJALAKUDA**

**UNIVERSITY OF CALICUT**

**MARCH 2024**

**CHRIST COLLEGE (AUTONOMOUS), IRINJALAKUDA**  
**CALICUT UNIVERSITY**



**DEPARTMENT OF PHYSICS CERTIFICATE**

This is to certify that the project report entitled “**Smart IoT Irrigation System**” is a bonafide record of project done by **ATHIRA V**, Reg.No. CCAVSPH044, under my guidance and supervision in partial fulfilment of the requirement for the award of the degree of **BACHELOR OF PHYSICS** and it has not previously formed the basis for any Degree, Diploma and Associateship or Fellowship.

**Prof.V.P.Anto**

**Asst.Prof. Megha. P.S**

**Co-ordinator**

**Project guide**

## **DECLARATION**

I, **ATHIRA V**, hereby declare that the project work entitled “**Smart IoT Irrigation System**” is a record of independent and bonafide project work carried out by me under the supervision and guidance of Mrs. Megha .P.S, Asst. Professor, Department of Physics, Christ College (Autonomous), Irinjalakuda.

The information and data given in the report is authentic to the best of my knowledge. The report has not been previously submitted for the award of any Degree, Diploma, Associateship or other similar title of any other university or institute.

**Place: Irinjalakuda**

**ATHIRA V**

**Date:**

**CCA VSPH044**

Submitted for the examination held on \_\_\_\_\_

INTERNAL EXAMINER

EXTERNAL EXAMINER

# ACKNOWLEDGEMENT

I express my eternal gratitude to the Almighty, under whose divine guidance, I was able to complete this work successfully.

I am grateful to our principal, Rev. Dr. Jolly Andrews CMI for providing us various facilities.

I also express my gratitude to Prof. V.P. Anto, Co-ordinator of the Department, for his encouragement and support for the preparation.

I express my gratitude to Mrs. Megha. P.S, Asst. Professor, whose guidance and support throughout the period helped me to complete this work successfully.

I am also thankful to all the faculties of the department for their interest and cooperation.

I extend my gratitude to the librarian and other library staffs of my college for their wholehearted cooperation.

I express my sincere thanks to my friends and family for their support in accomplishing this project.

**Place: Irinjalakuda**

**ATHIRA V**

**Date:**

# **“Smart IoT Irrigation System”**

Project Report submitted to

**CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA**

*In partial fulfilment of the requirement for the award of the degree of*

**BACHELOR OF PHYSICS**

Submitted by

**BISMITHA I**

**(CCAVSPH045)**

Under the supervision of

**Asst.Prof.Megha P S**



**DEPARTMENT OF PHYSICS**

**CHRIST COLLEGE (AUTONOMOUS), IRINJALAKUDA**

**UNIVERSITY OF CALICUT**

**MARCH 2024**



**CHRIST COLLEGE (AUTONOMOUS), IRINJALAKUDA**  
**CALICUT UNIVERSITY**



**DEPARTMENT OF PHYSICS CERTIFICATE**

This is to certify that the project report entitled “**Smart IoT Irrigation System**” is a bonafide record of project done by **BISMITHA I** , Reg.No. CCAVSPH045, under my guidance and supervision in partial fulfilment of the requirement for the award of the degree of BACHELOR OF PHYSICS and it has not previously formed the basis for any Degree, Diploma and Associateship or Fellowship.

**Prof.V.P.Anto**  
**Co-ordinator**

**Asst.Prof. Megha. P.S**  
**Project guide**

## **DECLARATION**

I, **BISMITHA I**, hereby declare that the project work entitled “**Smart IoT Irrigation System**” is a record of independent and bonafide project work carried out by me under the supervision and guidance of Mrs. Megha .P.S, Asst. Professor, Department of Physics, Christ College (Autonomous), Irinjalakuda.

The information and data given in the report is authentic to the best of my knowledge. The report has not been previously submitted for the award of any Degree, Diploma, Associateship or other similar title of any other university or institute.

**Place: Irinjalakuda**

**BISMITHA I**

**Date:**

**CCAVSPH045**

Submitted for the examination held on \_\_\_\_\_

INTERNAL EXAMINER

EXTERNAL EXAMINER

# ACKNOWLEDGEMENT

I express my eternal gratitude to the Almighty, under whose divine guidance, I was able to complete this work successfully.

I am grateful to our principal, Rev.Dr. Jolly Andrews CMI for providing us various facilities.

I also express my gratitude to Prof .V.P. Anto , Co-ordinator of the Department, for his encouragement and support for the preparation.

I express my gratitude to Mrs. Megha. P.S, Asst. Professor, whose guidance and support throughout the period helped me to complete this work successfully.

I am also thankful to all the faculties of the department for their interest and cooperation.

I extend my gratitude to the librarian and other library staffs of my college for their wholehearted cooperation.

I express my sincere thanks to my friends and family for their support in accomplishing this project.

**Place: Irinjalakuda**

**BISMITHA I**

**Date:**

# **“Development of 'Ampere', an electricity bill calculation app and analysis of Domestic Electricity Consumption using python software”**

A project report submitted to

**CHRIST COLLEGE (AUTONOMOUS) IRINJALAKUDA**

*In partial fulfillment of the requirement for the award of the degree of*

**BACHELOR OF PHYSICS**

Submitted by

**C J DHANUSREE  
(CCAVSPH046)**

Under the supervision of  
**MS. ANJALI JOBY**



**Department of Physics  
CHRIST COLLEGE (AUTONOMOUS), IRINJALAKUDA  
UNIVERSITY OF CALICUT**

**MARCH 2024**

**CHRIST COLLEGE (AUTONOMOUS)**

**IRINJALAKUDA**

**UNIVERSITY OF CALICUT**

**MARCH 2024**



**DEPARTMENT OF PHYSICS CERTIFICATE**

This is to certify that the project report entitled “**Development of 'Ampere', an electricity bill calculation app and analysis of Domestic Electricity Consumption using python software**” is a bonafide record of project done by C J DHANUSREE , Reg. No. CCAVSPH046, under my guidance and supervision in partial fulfilment of the requirement for the award of the degree of BACHELOR OF PHYSICS and it has not previously formed the basis for any Degree, Diploma and Associateship or Fellowship.

Prof. V.P Anto  
Co-ordinator

Ms. Anjali joby  
Project Guide

Submitted for the examination held on :

Internal Examiner :

External Examiner:

# DECLARATION

I C J DHANUSREE . hereby declare that the project work entitled “**Development of 'Ampere', an electricity bill calculation app and analysis of Domestic Electricity Consumption using python software**” is recorded of independent and bonafide project work carried out by Me under the supervision and guidance of Ms. Anjali joby, Asst. Professor, Department of Physics , Christ College Autonomous Irinjalakuda. The information and data given in the report is authentic to the best of my knowledge. The report has not been previously submitted for the award of any Degree, Diploma, Associateship or other similar tile of any other university or institute

Place: Irinjalakuda

Date: 25/03/2024

C J DHANUSREE

CCAVSPH046

## ACKNOWLEDGEMENT

I would like to take the opportunity to express my preferred thanks and gratitude to all people who have helped me with sound advice and able guidance

Above all , I express my eternal gratitude to lord almighty under whose divine guidance ;  
I have been able to complete this work successfully .

I would like to express my sincere obligation to Rev. DR. Jolly Andrews CMI , our principal for providing various facilities.

Im thankful to Prof. V.P Anto coordinator of Department for providing proper help and encouragement in the preparation of this report.

I express my sincere gratitude to Ms. Anjali joby , Asst. Professor on contract , whose guidance and support throughout the period helped me to complete this work successfully

I would like to express my preferred gratitude to all faculties especially Dr. V.P Joseph and Mr. Jose Sunny of the Department for their interest and cooperation in this regard  
I extend my heartly gratitude to the Librarian and the Library staffs of my college for their whole hearted cooperation.

I express my sincere thanks to my friends and family for their support in completing this report successfully.

Place:IRINJALAKUDA

Date: 25/03/2024

C J DHANUSREE

CCAVSPH046