

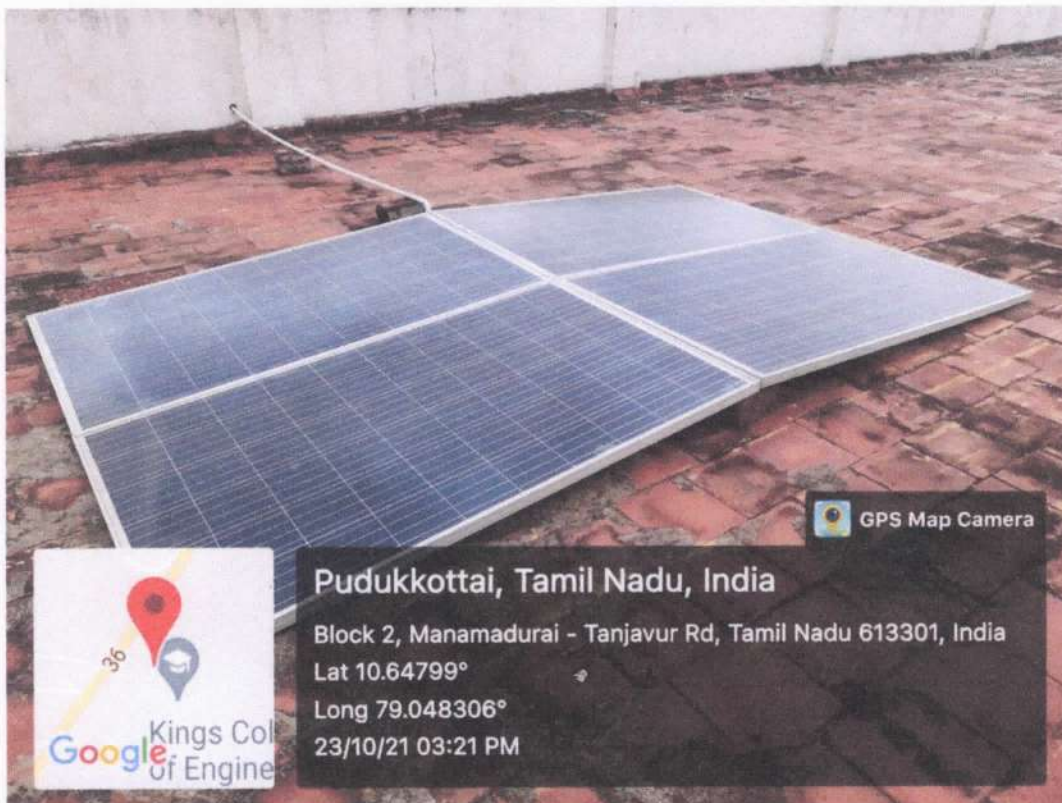
7.1.2 - Alternate Sources of Energy and Energy Conservation Measures



INDEX

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 Kings College of Engineering
 PUNALKULAM - 613 303.



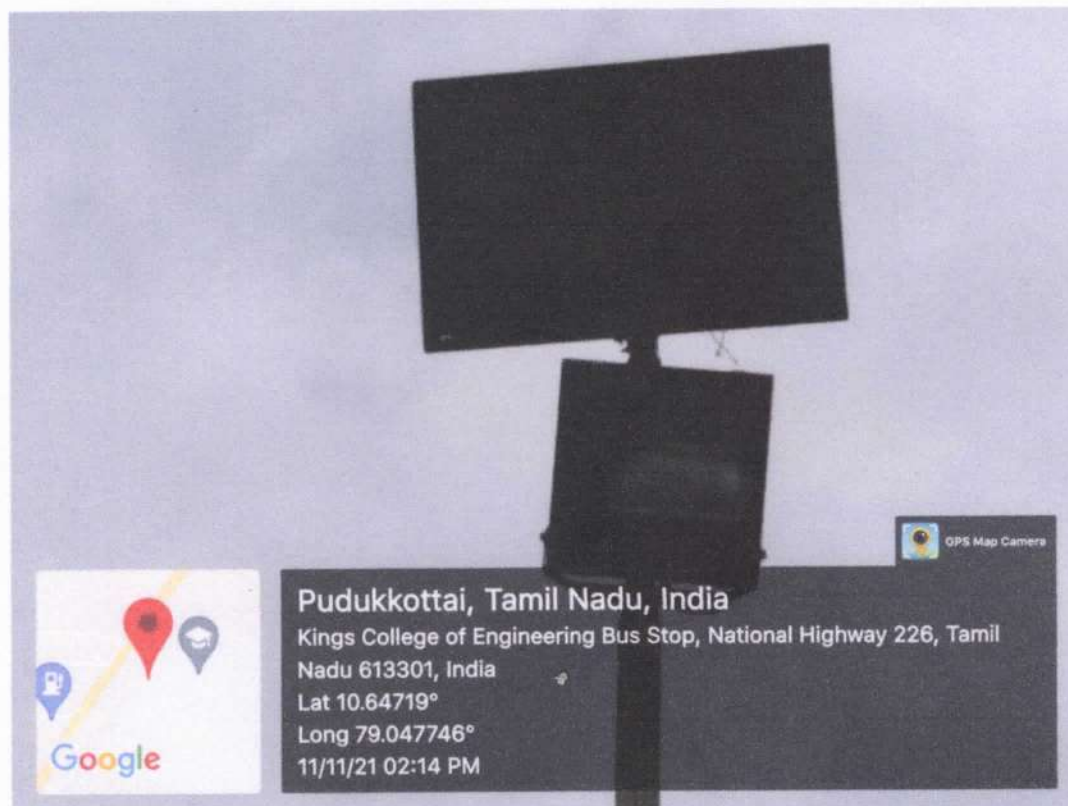
SOLAR PANEL

J. Praveen
PRINCIPAL
Kings College of Engineering
PUNALKULAM - 613 303.

S.No.	Particulars	Rating
1.	Rated Power	4 x 260W
2.	Open circuit voltage	38.12V
3.	Short circuit current	8.9A
4.	Voltage at maximum power	30.40V
5.	Current at maximum power	8.57A
6.	Maximum system voltage	1000V
7.	Module weight	18.3Kg

J. Prasad

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PUNALKULAM - 613 303.



LED LIGHT

T. Praveen
PRINCIPAL
Kings College of Engineering.
PUNALKULAM - 613 303.

Locations of LED lights

Room / lab Detail	Specification	Maximum power rating	No. of LED lights
Block I			
Principal room	LED light	40W	04
Secretary room	LED light	40W	06
Optical lab	LED tube light	40W	06
Block I building opposite	LED Street light	55W	10
Block II building opposite	LED Street light	250W	06
Block III			
Ground Floor (Girls)	LED tube light	40W	20
Ground floor (boys)	LED bulb	40W	02
Ground floor (boys)	LED tube light	40W	14
Kitchen	LED light	40W	14
Block IV			
Bath room 1 st floor	LED light	40W	04
Varanda 2 nd floor	LED light	40W	01
Bath room 2 nd floor	LED light	40W	02
Library Block			
Ground floor	LED light	25W	01
Street lights (LED)	Canteen	20W	02
	First year block	20W	01
	Physics lab	20W	01
	Ground side	20W	03
	Girls hostel	20W	03
	Library back	55W	05
	Gate compound	20W	03
	Outside	20W	02


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 Kings College of Engineering
 PUNALKULAM - 613 303.

GST TAX INVOICE

Fomra ElectricalsNo.250, Govindappa Street,
Chennai 600001

TamilNadu-33

GSTIN/UIN: 33AAFF5631Q1ZA

State Name : Tamil Nadu, Code : 33

E-Mail : info@fomra.co.in

Consignee (Ship to)

KINGS COLLEGE OF ENGINEERING

NO.2851/35,KAMALASUBRAMANIAM, ARCADE,

PEDHA PERUMAL COLONY,THANJAVUR-613001

9944345066

State Name : Tamil Nadu, Code : 33

Buyer (Bill to)

KINGS COLLEGE OF ENGINEERING

NO.2851/35,KAMALASUBRAMANIAM, ARCADE,

PEDHA PERUMAL COLONY,THANJAVUR-613001

State Name : Tamil Nadu, Code : 33

Invoice No.	e-Way Bill No.	Dated
HOGST-2122-02576		17-Sep-21
Delivery Note	Mode/Terms of Payment	
Reference No. & Date.	Other References	
goutham dt. 17-Sep-21		
Buyer's Order No.	Dated	
Dispatch Doc No.	Delivery Note Date	
Dispatched through	Destination	
Terms & Conditions		

Sl No.	Description of Goods	HSN/SAC	Quantity	Rate	per Disc. %	Amount
1	LEGRAND 408593 20A SP MCB DX3	85362030	6 NOS	128.80	NOS	772.80
2	LEGRAND 607841/507811 20A SP P&S DB	85371000	3 NOS	1,085.80	NOS	3,257.40
3	25MM PVC PIPE	39172310	13 LENGTH	113.00	LENGTH	1,469.00
4	25MM PVC BEND	39174000	19 NOS	10.25	NOS	194.75
5	25MM PVC JUNCTION BOX	39174000	4 NOS	17.00	NOS	68.00
6	25MM PVC CLAMP	3917	50 NOS	4.50	NOS	225.00
7	4.0SQM FR COP WIRE 90 MTR	85446090	3 COIL	3,323.00	COIL	9,969.00
8	1.5SQM FR COP WIRE 90MTR	85446090	1 COIL	1,434.00	COIL	1,434.00
9	25MM PVC COUPLING	39174000	7 NOS	6.50	NOS	45.50
10	16" WALL MOUNTING FAN	84145190	5 NOS	1,925.00	NOS	9,625.00
11	2X2 LED FITTING 48W	94051010	8 NOS	2,070.00	NOS	16,560.00
12	LEGRAND 689011 FLUSH BOX 12M	85362030	2 NOS	507.18	NOS	1,014.36
13	LEGRAND 673000 6A 1W SWITCH MYRIUS	85365020	11 NOS	53.20	NOS	585.20
14	LEGRAND 673008 16A 1W SWITCH MYRIUS	85365020	2 NOS	110.20	NOS	220.40
15	LEGRAND 673044 6A 5PIN SOCKET MYRIUS	85366910	3 NOS	117.80	NOS	353.40
16	LEGRAND 673045 6/16A 3 PIN SOCKET MYRIUS	85366910	2 NOS	162.64	NOS	325.28
17	BATTEN HOLDER	85365090	1 NOS	32.00	NOS	32.00
18	12W LED BULB	94051090	1 NOS	230.00	NOS	230.00
19	1.5SQM FR COP WIRE 90MTR	85446090	2 COIL	1,434.00	COIL	2,868.00
						49,249.09
	SGST OUTPUT TAX					3,928.74
	CGST OUTPUT TAX					3,928.74
	ROUND OFF - L12311					0.43
	Total					₹ 57,107.00

Amount Chargeable (in words)

INR Fifty Seven Thousand One Hundred Seven Only

E. & O.E

Company's PAN

: AAFF5631Q

Declaration

We declare that this invoice shows the actual price of the goods described and that all particulars are true and correct

TERMS AND CONDITIONS:

1. Goods once sold cannot be taken back or exchanged
2. Any discrepancies in the bill should be intimated with 7days
3. Interest will be charged @18% p.a. if bills are not settled with in the due date
4. No deduction to be made in any case without our consent
5. All disputes are subject to Chennai jurisdiction

for Fomra Electricals

Authorised Signatory

This is a Computer Generated Invoice

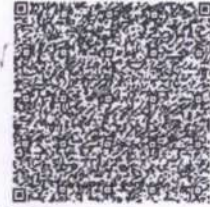
J. Ramesh
PRINCIPAL
 Kings College of Engineering.

GST TAX INVOICE

(ORIGINAL FOR RECIPIENT)

e-Invoice

IRN : af3409d885f42e16f5ed98aa5f43d03d0017-
1778fab61656f23b7ae5ab029f02
Ack No. : 152111036912659
Ack Date: 2-Sep-21

**Fomra Electricals**

No.250, Govindappa Street,
Chennai 600001
TamilNadu-33
GSTIN/UIN: 33AAAFF5631Q1ZA
State Name : Tamil Nadu, Code : 33
E-Mail : info@fomra.co.in
Consignee (Ship to)

GOLDEN VATS PRIVATE LTD
KINGS COLLEGE OF ENG
GIRLS HOSTEL ELECTRICAL
THANJAVUR
MOB NO:9944345066
GSTIN/UIN : 33AACCG9782G1ZE
State Name : Tamil Nadu, Code : 33

Buyer (Bill to)

GOLDEN VATS PRIVATE LTD
KANAVUR VILLAGE,
MANNARGUDI TALUK, THIRUVARUR DISTRICT
GSTIN/UIN : 33AACCG9782G1ZE
State Name : Tamil Nadu, Code : 33

Invoice No. e-Way Bill No. Dated
HOGST-2122-02274
Delivery Note
2-Sep-21
Mode/Terms of Payment
0
Other References
Reference No. & Date.
NOOR dt. 2-Sep-21
Buyer's Order No.
Dated
BY MAIL
31-Aug-21
Dispatch Doc No.
Delivery Note Date
Dispatched through
Destination
Terms & Conditions

SI No	Description of Goods	HSN/SAC	Quantity	Rate	per	Disc %	Amount
1	20W LED FITTING C.G	94051010	80 NOS	225.00	NOS	1 %	17,820.00
2	CROMPTON 48" HIGH SPEED CEILING FAN	8414	20 NOS	1,700.00	NOS	1 %	33,660.00
3	2.5 MFD CONDENSOR KELTRON	85322500	24 NOS	37.00	NOS	1 %	879.12
4	BATTEN HOLDER	85365090	8 NOS	32.00	NOS	1 %	253.44
5	14W LED BULB C.G	94051090	8 NOS	190.00	NOS	1 %	1,504.80
6	ANCHOR 51373 6A 1WAY SWITCH	85365020	12 NOS	15.00	NOS	1 %	178.20
7	19MM PVC TAPE ROLL	85469090	10 NOS	10.00	NOS	1 %	99.00
							54,394.56
							SGST OUTPUT TAX 4,315.77
							CGST OUTPUT TAX 4,315.77
							ROUND OFF - L12311 (-)0.10
							Less

Amount Chargeable (in words)
INR Sixty Three Thousand Twenty Six Only

Total 162 NOS ₹ 63,026.00
E & O E

Company's PAN : AAFF5631Q

Declaration
We declare that this invoice shows the actual price of the goods described and that all particulars are true and correct

TERMS AND CONDITIONS:

1. Goods once sold cannot be taken back or exchanged
2. Any discrepancies in the bill should be intimated with 7days
3. Interest will be charged @ 18% p.a. if bills are not settled with in the due date
4. No deduction to be made in any case without our consent
5. All disputes are subject to Chennai jurisdiction

This is a Computer Generated Invoice

PRINCIPAL
Kings College of Engineering
PUNALKULAM - 613 303.



GST TAX INVOICE

(ORIGINAL FOR RECIPIENT)

e-Invoice

IRN : 4faefc49b944605320e5bdc0cd56bbdf23e5-
48de6a408e94348b061f30d33b35
Ack No. : 152111035945937
Ack Date: 2-Sep-21



Fomra Electricals
No.250, Govindappa Street,
Chennai 600001
TamilNadu-33
GSTIN/UIN: 33AAAFF5631Q1ZA
State Name : Tamil Nadu, Code : 33
E-Mail : info@fomra.co.in
Consignee (Ship to)

GOLDEN VATS PRIVATE LTD
KINGS COLLEGE OF ENG
LIBRARY GROUND FLOOR, I, II & III ELECTRICAL
THANJAVUR

GSTIN/UIN : 33AACCG9782G1ZE
State Name : Tamil Nadu, Code : 33

Buyer (Bill to)

GOLDEN VATS PRIVATE LTD
KANAVUR VILLAGE,
MANNARGUDI TALUK, THIRUVARUR DISTRICT
GSTIN/UIN : 33AACCG9782G1ZE
State Name : Tamil Nadu, Code : 33

Invoice No. **HOGST-2122-02275** Dated **2-Sep-21**
Delivery Note Mode/Terms of Payment
0 Other References
Reference No. & Date. **NOOR dt. 2-Sep-21**
Buyer's Order No. Dated
BY MAIL **31-Aug-21**
Dispatch Doc No. Delivery Note Date
Dispatched through Destination
Terms & Conditions

Sl No	Description of Goods	HSN/SAC	Quantity	Rate	per	Disc %	Amount
1	20W LED FITTING	94051010	3 NOS	225.00	NOS	1 %	668.25
2	36W LIFEMAX TUBELIGHTS PHILIPS	85393190	32 NOS	39.50	NOS	1 %	1,251.36
3	PHILIPS 36W SUMO SLIM CHOKE	85041010	30 NOS	135.00	NOS	1 %	4,009.50
4	2.5 MFD CONDENSOR	85322500	37 NOS	37.00	NOS	1 %	1,355.31
5	CROMPTON 48" HIGH SPEED CEILING FAN	8414	3 NOS	1,700.00	NOS	1 %	5,049.00
6	9W LED BULB	94051090	4 NOS	105.00	NOS	1 %	415.80
7	LEGRAND 673000 6A 1W SWITCH MYRIUS	85365020	3 NOS	63.00	NOS	1 %	187.11
8	680611 1M PLEXO BOX LEGRAND	85389000	3 NOS	709.50	NOS	1 %	2,107.22
							15,043.55
	SGST OUTPUT TAX						1,321.41
	CGST OUTPUT TAX						1,321.41
	Total		115 NOS				₹ 17,686.37

Amount Chargeable (in words)
INR Seventeen Thousand Six Hundred Eighty Six and Thirty Seven paise Only

Company's PAN : AAAFF5631Q

Declaration
We declare that this invoice shows the actual price of the goods described and that all particulars are true and correct
TERMS AND CONDITIONS:
1. Goods once sold cannot be taken back or exchanged
2. Any discrepancies in the bill should be intimated with 7 days
3. Interest will be charged @ 18% p.a. if bills are not settled with in the due date
4. No deduction to be made in any case without our consent
5. All disputes are subject to Chennai jurisdiction

This is a Computer Generated Invoice

J. Perumal



PRINCIPAL
Kings College of Engineering
PUNALKULAM - 613 303.

GST TAX INVOICE

(ORIGINAL FOR RECIPIENT)

e-Invoice

IRN : fb22735d1cb5cf029e1361b48c827e757c7b-
a524948e4a1b0a64bd7cdf56e15e
Ack No. : 152111035973851
Ack Date: 2-Sep-21



Fomra Electricals
No 250, Govindappa Street,
Chennai 600001
TamilNadu-33
GSTIN/UID: 33AAFF5631Q1ZA
State Name : Tamil Nadu, Code : 33
E-Mail : info@fomra.co.in
Consignee (Ship to)

GOLDEN VATS PRIVATE LTD
KINGS COLLEGE OF ENG
BOYS HOSTEL GF & 1ST FLOOR ELECTRICAL
THANJAVUR
GSTIN/UID : 33AACCG9782G1ZE
State Name : Tamil Nadu, Code : 33

Buyer (Bill to)
GOLDEN VATS PRIVATE LTD
KANAVUR VILLAGE,
MANNARGUDI TALUK, THIRUVARUR DISTRICT
GSTIN/UID : 33AACCG9782G1ZE
State Name : Tamil Nadu, Code : 33

Invoice No.
HOGST-2122-02277
Delivery Note
Reference No. & Date.
NOOR dt. 2-Sep-21
Buyer's Order No.
BY MAIL
Dispatch Doc No.
Dispatched through
Terms & Conditions

Dated
2-Sep-21
Mode/Terms of Payment
0
Other References
Dated
31-Aug-21
Delivery Note Date
Destination

SI No	Description of Goods	HSN/SAC	Quantity	Rate	per	Disc %	Amount
1	20W LED FITTING C.G.	94051010	35 NOS	225.00	NOS	1 %	7,796.25
2	36W LIFEMAX TUBELIGHTS PHILIPS 36W LIFEMAX TUBELIGHTS PHILIPS	85393190	25 NOS	39.50	NOS	1 %	977.63
3	PHILIPS 36W SUMO SLIM CHOKE	85041010	10 NOS	135.00	NOS	1 %	1,336.50
4	LEGRAND 673000 6A 1W SWITCH MYRIUS	85365020	15 NOS	63.00	NOS	1 %	935.55
5	LEGRAND 673008 16A 1W SWITCH MYRIUS	85365020	6 NOS	130.50	NOS	1 %	775.17
6	2.5 MFD CONDENSOR KELTRON	85322500	12 NOS	37.00	NOS	1 %	439.56
7	CROMPTON 48" HIGH SPEED CEILING FAN	8414	10 NOS	1,700.00	NOS	1 %	16,830.00
							29,090.66
	SGST OUTPUT TAX						2,384.29
	CGST OUTPUT TAX						2,384.29
	ROUND OFF - L12311						(-).0.24

Less :

Total 113 NOS ₹ 33,859.00
E & O E

Amount Chargeable (in words)
INR Thirty Three Thousand Eight Hundred Fifty Nine Only

Company's PAN : AAFF5631Q

Deduction
We declare that this invoice shows the actual price of the goods described and that all particulars are true and correct
TERMS AND CONDITIONS:
1. Goods once sold cannot be taken back or exchanged.
2. Any discrepancies in the bill should be intimated with 7 days.
3. Interest will be charged @ 18% p.a. if bills are not settled with in the due date.
4. No deduction to be made in any case without our consent.
5. All disputes are subject to Chennai jurisdiction.

This is a Computer Generated Invoice



PRINCIPAL
Kings College of Engineering.
PUNALKULAM - 613 303.

GST TAX INVOICE

(ORIGINAL FOR RECIPIENT)

e-Invoice

IRN : fda7ba60bfeca9e2a8a968c935075907475c-
f96db9312bfd463a621fa1cf3c84
Ack No. : 152111035994997
Ack Date : 2-Sep-21



Fomra Electricals
No.250, Govindappa Street,
Chennai 600001
TamilNadu-33
GSTIN/UIN: 33AAAFF5631Q1ZA
State Name : Tamil Nadu, Code : 33
E-Mail : info@fomra.co.in
Consignee (Ship to)
GOLDEN VATS PRIVATE LTD
KINGS COLLEGE OF ENG
IT BLOCK
THANJAVUR
GSTIN/UIN : 33AACCG9782G1ZE
State Name : Tamil Nadu, Code : 33

Buyer (Bill to)
GOLDEN VATS PRIVATE LTD
KANAVUR VILLAGE,
MANNARGUDI TALUK, THIRUVARUR DISTRICT
GSTIN/UIN : 33AACCG9782G1ZE
State Name : Tamil Nadu, Code : 33

Invoice No. e-Way Bill No. Dated
HOGST-2122-42278
Delivery Note 2-Sep-21
Reference No. & Date. Mode/Terms of Payment
NOOR dt. 2-Sep-21 0
Buyer's Order No. Other References
BY MAIL Dated
Dispatch Doc No. 31-Aug-21
Dispatched through Delivery Note Date
Destination
Terms & Conditions

SI No.	Description of Goods	HSN/SAC	Quantity	Rate	per	Disc %	Amount
1	20W LED FITTING C.G	94051010	120 NOS	225.00	NOS	1 %	26,730.00
2	36W LIFEMAX TUBELIGHTS PHILIPS 36W LIFEMAX TUBELIGHTS PHILIPS	85393190	52 NOS	39.50	NOS	1 %	2,033.46
3	CROMPTON 48" HIGH SPEED CEILING FAN	8414	11 NOS	1,700.00	NOS	1 %	18,513.00
4	2.5 MFD CONDENSOR KELTRON	85322500	6 NOS	37.00	NOS	1 %	219.78
5	LEGRAND 673000 6A 1W SWITCH MYRIUS	85365020	23 NOS	63.00	NOS	1 %	1,434.51
6	LEGRAND 673029 FAN STEP REGULATOR 100W MYRIUS	84149030	16 NOS	417.00	NOS	1 %	6,605.28
7	LEGRAND 673044 6A 5PIN SOCKET MYRIUS	85366910	2 NOS	139.00	NOS	1 %	275.22
8	LEGRAND 673061 BLANKING PLATE MYRIUS	85381090	12 NOS	23.40	NOS	1 %	277.99
9	LEGRAND 689011 FLUSH BOX 12M	85362030	16 NOS	447.80	NOS	1 %	7,093.15
10	LEGRAND 689042 FLUSH BOX 8M	85362030	6 NOS	377.00	NOS	1 %	2,239.38
11	LEGRAND 689008 FLUSH BOX 3M	85362030	3 NOS	164.00	NOS	1 %	487.08
							65,908.85
SGST OUTPUT TAX							5,129.90
CGST OUTPUT TAX							5,129.90
ROUND OFF - L12311							0.35
Total							₹ 76,169.00

Amount Chargeable (in words)

INR Seventy Six Thousand One Hundred Sixty Nine Only

Company's PAN : AAAFF5631Q

Declaration
We declare that this invoice shows the actual price of the goods described and that all particulars are true and correct

TERMS AND CONDITIONS:

1. Goods once sold cannot be taken back or exchanged
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3. Interest will be charged @ 18% p.a. if bills are not settled with in the due date
4. No deduction to be made in any case without our consent
5. All disputes are subject to Chennai jurisdiction

This is a Computer Generated Invoice



PRINCIPAL
Kings College of Engineering
612 303

TAX INVOICE

DEVI ELECTRICALS

1083, East Main Street, Thanjavur - 613 001.

Email : devi.tanjore@gmail.com

ORIGINAL
Invoicingb (87)
DF/7083
DF/7086
DF/7783

GSTIN : 33AGSPM3141L1Z5

Ph : 04362 - 231348

Ph : 04362 - 23134

Invoice No : DF/7086	Date : 01/10/2020	P.O No :	Dt :
Reverse Charge : No		LR No :	Dt :
EBN		Payment : credit	
		No. of Packages :	POS :
Details of Receiver/ Billed To : KINGS COLLEGE OF ENGINEERING		Details of Consignee / Shipped To :	
GSTIN :		STATE : Tamil Nadu 33	

Code	Description of Goods	HSN	Qty	Rate	Disc. %	Tax %	Amount
ID4795	TS LED 20W PHILIPS SLIM LINE NEXT	94051090	90 NOS	187.50	0	12	18900.00
ID1890	CICO CELING PLATE	39174000	150 NOS	4.03	15	18	606.31
ID1892	CICO FAN COVER LARGE	39174000	120 NOS	13.56	15	18	1632.08
ID445	BK 38 X 6 JYPSUMM SCREW (1000)	7318	250 NOS	0.85	10	18	225.68
ID442	BK 19 X 6 JYPSUMM SCREW (1000)	73181190	150 NOS	0.64	10	18	101.95
ID443	BK 25 X 6 JYPSUMM SCREW (1000)	73181190	150 NOS	0.85	10	18	135.41
ID444	BK 32 X 6 JYPSUMM SCREW (1000)	73181190	100 NOS	1.06	10	18	112.57
ID171	COPPER 8	74081900	10.100 KG	625.00	10	18	6703.88
ID1530	CG 48" HIGH SPEED BROWN	84145190	115 nos	1305.08	0	18	177099.40
ID1563	CG EXHAUST 18" HVY DUTY	84145190	2 NOS	3559.32	0	18	8400.00
ID774	LG ISO 100A / 4 POLE - LEGRAND	85362030	1 NOS	1582.00	55	18	840.04
ID781	LG ISO 40A / 2 POLE - LEGRAND	85362030	8 NOS	524.00	55	18	2225.95
ID5357	LG MCB 10A DX3 - LEGRAND	85362030	25 NOS	284.00	60	18	3351.20
ID5366	LG MCB 20A DX3 - LEGRAND	85362030	10 NOS	284.00	60	18	1340.48
6755 01	MY 6A SWITCH - MYLINC	85365020	300 NOS	88.00	64	18	11214.72
6755 50	MY 6A 2 IN 1 - MYLINC	85365020	60 NOS	178.00	64	18	4536.86
6755 13	MY 16A WITH IND - MYLINC	85365020	25 NOS	218.00	64	18	2315.16
6755 30	MY MED STEP - MYLINC	85365020	115 NOS	642.00	64	18	31362.98

Amount in Words : Rs. Four Lakh Six Thousand Six Hundred and One Only

Sub Total : 271104.60

Total No. of Items : 2097 1

Tax %	Taxable Rs	CGST %	CGST Rs	SGST %	SGST Rs
5	1857.15	2.5	46.43	2.5	46.43
12	16875.00	6	1012.50	6	1012.50
18	326907.80	9	29421.71	9	29421.71

Bank Details :

Bank : KOTAK MAHINDRA
BANK
A/c No : 0212952739
IFSC : KKBK0008783
Branch : THANJAVUR

TERMS & CONDITIONS

1. Goods once sold cannot be taken back or exchanged
2. All Disputes subject to Thanjavur Jurisdiction Only
3. Our Responsibility ceases the moment goods leave our godown
4. Interest @ 24% p.a will be charged after Due date

E & O.E

Taken By :
PETERRAJChecked By :
MOORTHY

For DEVI ELECTRICALS

Authorised Signatory

PRINCIPAL



IoT BASED ROOM AUTOMATION SYSTEM

Date: 12.11.21

The Internet of Things (or commonly referred to as IoT) based Room Automation system (RAS), as the name suggests aims to control all the devices of smart room through internet protocols or cloud based computing.

This project presents the overall design of Room Automation System with low cost and wireless system. It specifically focuses on the development of an IoT based home automation system that is able to control various components via internet or be automatically programmed to operate from ambient conditions. In this project, we have designed the development of a firmware for smart control which can successfully be automated minimizing human interaction to preserve the integrity within whole electrical devices in the room. We used NodeMCU, a popular open source IoT platform, to execute the process of automation. Different components of the system will use different transmission mode that will be implemented to communicate the control of the devices by the user through NodeMCU to the actual appliance. The main control system implements wireless technology to provide remote access from smart phone. We are using a cloud server-based communication that would add to the practicality of the project by enabling unrestricted access of the appliances to the user irrespective of the distance factor. We provided a data transmission network to create a stronger automation. The system intended to control electrical appliances and devices in room with relatively low cost design, user-friendly interface and ease of installation. The status of the appliance would be available, along with the control on an android platform.

The system is based on NodeMCU board as an Internet of Things system. The NodeMCU is connected to the internet from the hotspot of the smart phone via WIFI connection as the NodeMCU has ESP8266 circuit to connect with the internet. NodeMCU to be connected to the hotspot of the smart phone, needs to be identified to the name of hotspot, the password and token code letting the server of Blynk connects them together. The computer, once transfer the code from Arduino IDE to the NodeMCU kit to prepare the software part of the project. Figure 1 shows that the server of Blynk application will process the smartphone-NodeMCU connection.


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 Kings College of Engineering
 PUNALKULAM - 613 303.

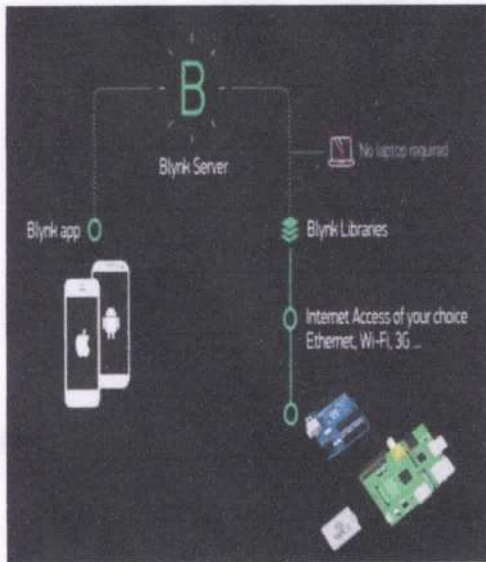


Figure 1. Blynk System Principle

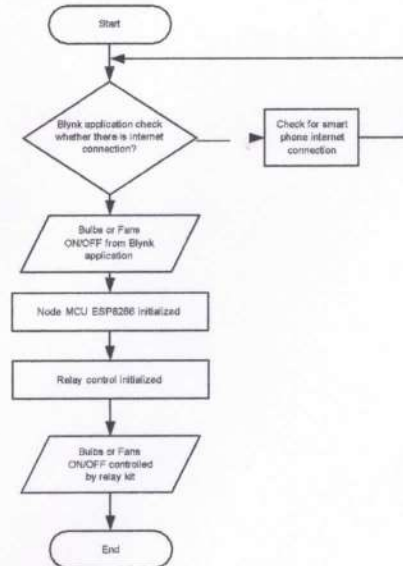
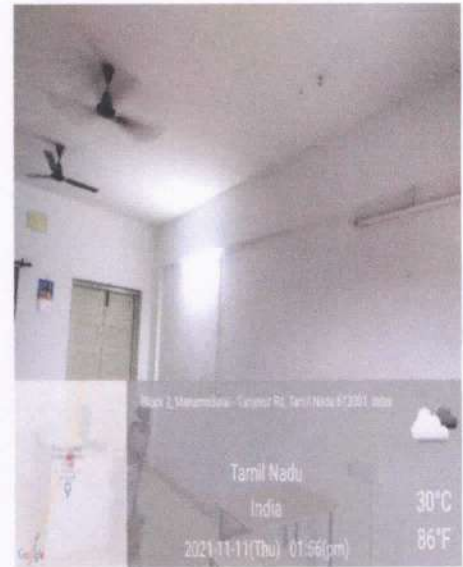
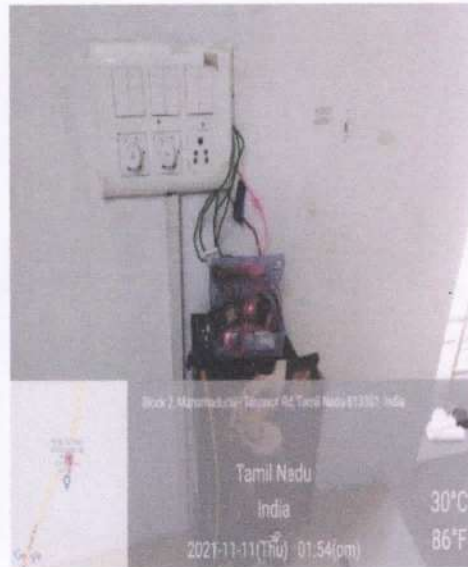
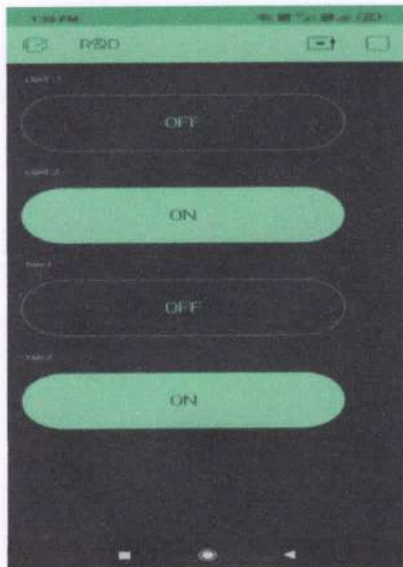


Figure 2. Flowchart of Load ON/OFF

Blynk server will check for internet connection, NodeMCU with android hotspot, the NodeMCU code includes the token code, the name of hotspot and it's password. The information included to the code must be match with the hotspot information to allow ESP8266 connect with the WIFI to be as a channel to exchange commands between smart phone and NodeMCU. Remaining processes are just commands sent from Blynk application to NodeMCU to control loads those are connected to the relay kit as shown in Figure 2.

We implemented the system in our institute Innovation Club laboratory to control two fans and two lights.



Implementation of RAS in Innovation Club Laboratory

P. Narasimhan
12/11/21
Staff Incharge

J. Narasimhan
PRINCIPAL
Kings College of Engineering.
PUNALKULAM - 613 303.

J. Narasimhan
12/11/2021
Principal



KINGS
COLLEGE OF ENGINEERING

Punalkulam - 613 303, Thanjavur.



STOCK

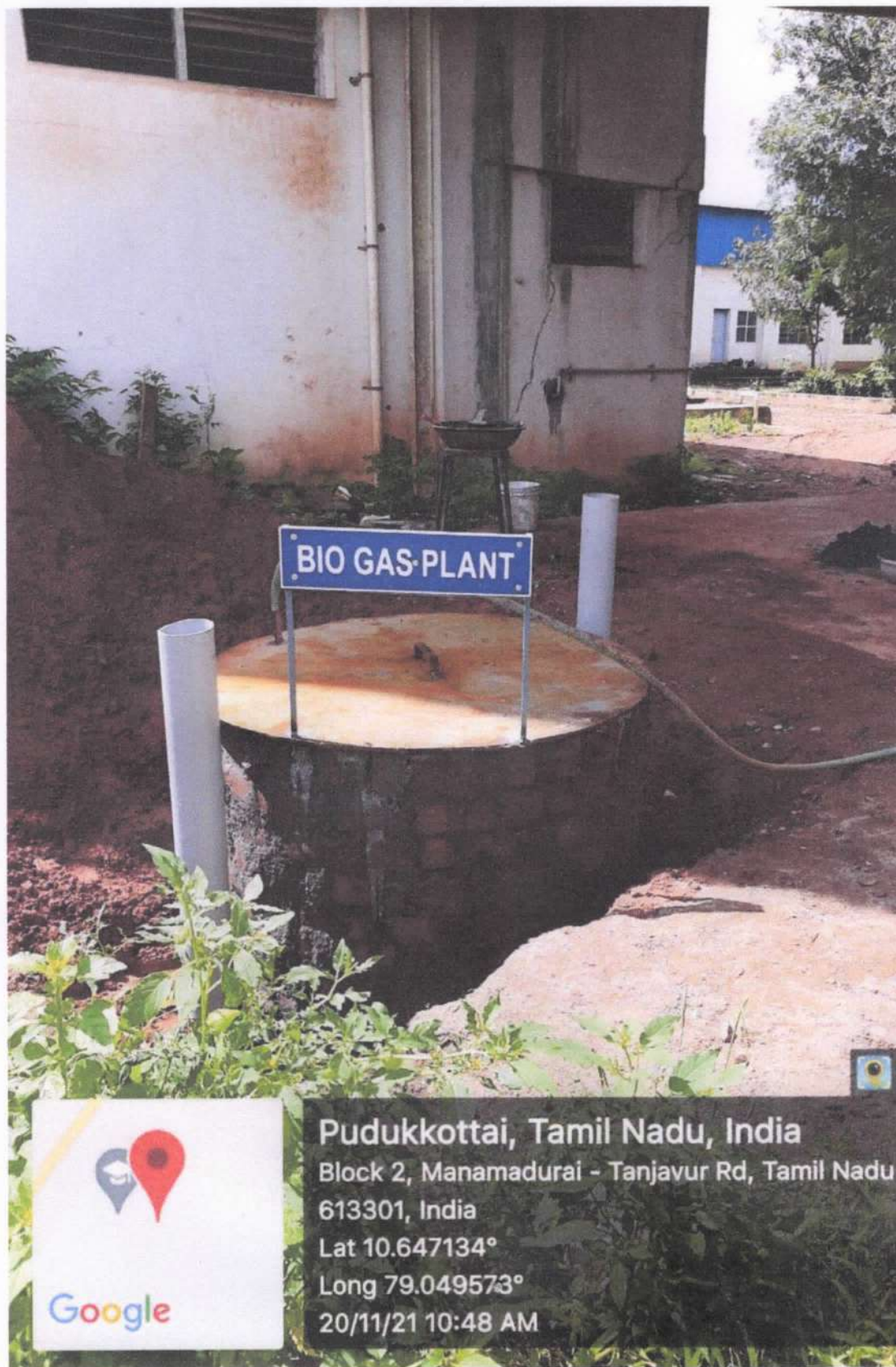
REGISTER

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Name of the Lab		Department	Invoice date and Number		Specification	ID No	Receipt Quantity	Unit Price	Total Cost	Issued		Balance No of Item	Signature of the Lab Incharge	Remarks
Sl No	Date of Receipt	Name and Address of the supplier								Mode	Nos.			
1.	23.01.2021	Constflex Technologies Private Limited, Building nos 13 and 14, 3rd floor, 2nd main, Siddaiah Road near Passport office, Sudhamanagar, Bangalore, Karnataka 560029	23.01.2021	2051300730	IR Sensor Module		1	33.00	33.00					
					2051300730		2	57.00	114.00					
					Module HC-SR501									
					ultrasonic distance sensor		2	59.00	118.00					
					Module NANO V40 Development Board - China Compatible with Arduino Uno		2	159.00	318.00					
					2 Channel 485 Relay Module		5	40.00	200.00					
					1 Channel 485 Relay Module		2	75.00	150.00					
					1 Channel 485 Relay Module		5	65.00	325.00					
					Arduino Uno R3 Development Board		5	325.00	1625.00					
					DHT11 Temperature and Humidity Sensor		1	345.00	345.00					
					Sealed Air Sensor Module		2	57.00	114.00					
					MAX30102 Air Quality and Gas Sensor Module		1	175.00	175.00					
					Maxim Integrated Systems Corporation		2	45.00	90.00					
					ESP8266 Development Board with Wifi and Bluetooth		1	365.00	365.00					
					ESP8266 Development Board		5	490.00	2450.00					
					Mobile Software for Raspberry Pi		1	360.00	360.00					
					Raspberry Pi 4 Model B 4GB		1	2675.00	2675.00					
					Raspberry Pi 4 Model B 8GB		1	310.00	310.00					
					Official Raspberry Pi 4 Model B		1	45.00	45.00					
					75.00			75.00						
					Subtotal			8547.00	8547.00					
					Single Discount			-125.00	-125.00					
					Cashier Delivery Fee			50.00	50.00					
					IGST (18%)			1526.58	1526.58					
					Total			as 10,007.58	10,007.58					

J. Praveen
PRINCIPAL
Kings College of Engineering.
PUNALKULAM - 613 303.

9/11/2021



BIO GAS PLANT

J. Ramakrishna
PRINCIPAL
Kings College of Engineering.
PUNALKULAM - 613 303.