SGK GOVERNMENT DEGREE COLLEGE- VINUKONDA
GUNTUR DIST.A.P:522647

CERTIFICATE COURSE

In

BASICS OF ELECTRICITY

& HOUSE WIRING

ORGANIZED BY

DEPARTMENT OF PHYSICS

DATE: 14 .03.2022 to 23-04-2022

A.Y- 2021-2022

ABOUT THE COLLEGE

Srimathi Gangineni Kalyani Government Degree College, Vinukonda was established in 1980 to serve the higher education needs of the academically backward Palnadu region. It is located on the outskirts of Vinukonda, a small town in Guntur district. It is the only Government Degree College catering the academic aspirations of the young in palnadu region. Till 1979, students who were desirous of pursuing higher education were moving too far off places. The philanthropic intervention of Sri Gangineni Venkateswara Rao, Ex- MLA, Sri O. Venkateswarlu, Ex- MLA and Dr. V. Adi Reddy could realize the higher education dreams of the students on 11th September 1980. Initially, it rendered its services in the name of Madala Satyannarayana and Manne Rathamma Government Degree College and later re-named after its donor and former Principal Srimati Gangineni Kalyani (late). The college is sprawled out over 21 acres of vast land area and eco-friendly environment. It provides spacious and aerated classrooms, well equipped laboratories, library with 12,500 books and reading room, modern gymnasium, virtual lab, English language lab, Jawahar Knowledge Centre (JKC) for skill development, which are all well supported by serene and iconic ambience. The college achieved the status of 2(f) and 12(B) in 1994. For the quality education it has been imparting for the last 40 years, strictly adhering to the guidelines of UGC, it has been conferred with NAAC 'B' Grade twice (2006 & 2015).The college takes pride by offering quality education to students from the competent and qualified teaching faculty. The college has 20 sanctioned teaching posts, including Principal. Of them, six faculty members have Doctoral degrees in their respective subjects, one has M.Phil. Degree and all the lecturers have qualified in NET/SLET/SET. The college also provides opportunity for students to receive online certification from Spoken Tutorial maintained by IIT,Bombay and CISCO certified courses fee of cost. Also imparting training in General knowledge and aptitude to prepare the students for competitive examinations and providing access to Jagananna Vidya Deevena and Vasthi Deevena scholarships given by Government of Andhra Pradesh to support students.

OUR VISION:

The vision of the institution is to make available higher education to all the young aspirants of the regionand to edify their overall personality, keeping the emerging trends of the society in the view.

OUR MISSION:

To materialize the vision mentioned above, the mission is divided into the following achievableobjectives.

- □ Catering to the academic needs of the rural poor students□□ Imparting life skills to fit the studentsin the job market effectively
- □ Inculcating the spirit of diligence to achieve their goal and build their career
- □ Enriching the curriculum with value-based activities for the holistic development of the students
- □ Fostering the spirit of confidence and sportsmanship

OBJECTIVES:

- □ Serving the needs of rural students
- □ To enable the poor and down trodden/under privileged sections of the society and access togainful employment opportunities by imparting skill oriented education.
- □ To achieve the academic excellence
- □ To inculcate human values and social responsibilities

ABOUT THE DEPARTMENT

Department of Physics was established in 1983 with an objective of providing quality science education in the conventional areas of sciences. It is the major department in the college with 1 sanctioned post with 83 Physics students serving 2 Physics combination groups (MPC, MPCs) in Physics undergraduate programme. The department has also dedicated, motivated, and enthusiastic group of faculty members actively involving in both teaching and research. The department encourages the students for completion of MOOCS, certificate courses and innovative activities. The Department of Physics recognizes and respects individual differences and we care deeply about the educational and career development of every member of our community. We always try to transforming the young to become good and responsible Indian citizens.

VISION:

Educating students in frontier areas of Physics enables them to solve the problems of society

MISSION:

- □ To inculcate the outcome based on holistic education in frontier areas of physics.
- □ To develop competent physicists who address future issues of society.
- □ To produce good quality human resources sensitive to environmental and sustainable development issues.
- □ To produce globally competitive, ethical and socially responsible young minds.

COURSES OFFERED

Course	Specialization	Intake	Medium
B.Sc	Mathematics, Physics, Chemistry	30	English
B.Sc	Mathematics, Physics, Computer Science	30	English

FACULTY PROFILE:

Name of the Faculty	Qualifications	Position
Sri B. NageswaraRao	**M. Sc, NET, A.P SET**	Lecturer in physics

ABOUT THE CERTIFICATE COURSE

Learning Objectives:

1. To learn about basic electricity terms like voltage, current, resistance, Capacitance and inductance.
2. To acquire working knowledge on mulitimeters, Galvanometers, Ammeters and Voltmeters.
3. To learn about the working of Transformer, and how the electrical energy consumption measured in units etc.,
4. Acquire necessary skills on Single, Three phase connections and basics of house wiring.

Learning Outcomes:

By successful completion of the course, students will be able to:

1. Acquire necessary skills / working knowledge on multimeters, galvanometers, ammeters, voltmeters, transformers, single phase and three phase connections, basics of electrical wiring with electrical protection devices.
2. Understand the working principles of different household domestic appliances.
3. Check the electrical connections at house-hold

Syllabus

UNIT-I

Voltage, Current, Resistance, Capacitance, Inductance, Electrical conductors and Insulators, Ohm's law, Series and parallel combinations of resistors, Galvanometer, Ammeter, Voltmeter, Multimeter,

UNIT-II

Transformers, Electrical energy, Power, Kilowatt hour (kWh), consumption of electrical power, Direct current and alternating current, RMS and peak values, Power factor, Single phase and three phase connections

UNIT-II

Basics of House wiring , Star and delta connection , Electric shock, First aid for electric shock, Overloading , Earthing and its necessity, Short circuiting , Fuses , MCB , ELCB, Insulation, Inverter, UPS

BROCHURE

S G K GOVERNMENT DEGREE COLLEGE

(Affiliated to Acharya Nagarjuna University, Guntur, A.P.)

NAAC with 'B'

Vinukonda, Palnadu District, Andhra Pradesh

DEPARTMENT OF PHYSICS OFFERS

Basics of Electricity & House wiring

14 th March 2022

TO

30 th April 2022

vinukonda.jkc@gmail.com

www.sgkgdcvinukonda.ac.in

5
21-2-22 Signatures

LIST OF STUDENTS ENROLLED

S. No	Hall Ticket no	Name of the Student	Group
1	Y213099037	ANNANGI SANJEEV RAJU	I B. Sc (M.P.C)
2	Y213099038	CHANDA VENKATA RAMADEVI	I B. Sc (M.P.C)
3	Y213099039	CHIRAMPALLI TULASI	I B. Sc (M.P.C)
4	Y213099040	GURRALA MANJULA RANI	I B. Sc (M.P.C)
5	Y213099041	KANDETI NAGA LAKSHMI	I B. Sc (M.P.C)
6	Y213099042	MERAJOTHU BUJJI BABU NAIK	I B. Sc (M.P.C)
7	Y213099044	PEDDEETI JOHN CHAITANYA KUMAR	I B. Sc (M.P.C)
8	Y213099047	VEERISETTY PRASANNA VANI	I B. Sc (M.P.C)
9	Y213099048	BAILADUGU TARAKA ARJUN	I B. Sc (M.P.Cs)
10	Y213099049	BANKA GURAVAMMA	I B.Sc (M.P.Cs)
11	Y213099050	CHANGALA SAI VENKATA GANESH	I B.Sc (M.P.Cs)
12	Y213099051	DASARI RATNA KUMARI	I B.Sc (M.P.Cs)
13	Y213099052	GOPU VENKATESH	I B.Sc (M.P.Cs)
14	Y213099053	JEEDIMALLA BHANU PRASAD	I B.Sc (M.P.Cs)
15	Y213099055	KANHARLA GAYATHRI	I B.Sc (M.P.Cs)
16	Y213099056	KISTAM CHANDRA SEKHAR	I B.Sc (M.P.Cs)
17	Y213099057	K. VENKATA LAKSHMI PADMAVATHI	I B.Sc (M.P.Cs)
18	Y213099058	MALAPATI KRUPARAJU	I B.Sc (M.P.Cs)
19	Y213099059	MANNEPALLI VENKATESH	I B.Sc (M.P.Cs)
20	Y213099060	MUTUKURI KIRAN KUMAR	I B.Sc (M.P.Cs)
21	Y213099062	ORSU GOPI	I B.Sc (M.P.Cs)
22	Y213099063	PADARA VENKAT	I B.Sc (M.P.Cs)
23	Y213099064	PALADUGU MAHESWARI	I B.Sc (M.P.Cs)
24	Y213099065	PALLEPOGU RAKESH	I B.Sc (M.P.Cs)
25	Y213099066	PASUMARTHI RAHIMUNNISA	I B.Sc (M.P.Cs)
26	Y213099067	PEDDEETI DURGA PRASAD	I B.Sc (M.P.Cs)
27	Y213099068	SETTI NAGALAKSHMAIAH	I B.Sc (M.P.Cs)
28	Y213099069	SHAIK RAAFIYA	I B.Sc (M.P.Cs)
29	Y213099070	SHAIK ZAKIRA ROSHAN	I B.Sc (M.P.Cs)
30	Y213099071	SHIAK IMRAN BASHA	I B.Sc (M.P.Cs)
31	Y213099072	VELPULA AKSHAYA BABU	I B.Sc (M.P.Cs)
32	Y213099073	YADLAPALLI VASU	I B.Sc (M.P.Cs)

IQAC COORDINATOR
SGK GOVT DEGREE COLLEGE VINUKONDA
PALNADU DIST - 522 647

SGK GOVT DEGREE COLLEGE * VINUKONDA, PALNADU DIST. *

Principal
SGK Govt. Degree College
Vinukonda - 522647

5/2021-22

Detailed Pedagogical Plan

S. No.	Date	Name of the Topic	Taken By
1	14.03.2022	Introduction & Syllabus	Mr. B. NageswaraRao
2	15.03.2022	Voltage, Current,	Mr. B. NageswaraRao
3	16.03.2022	Resistance, Capacitance	Mr. B. NageswaraRao
4	17.03.2022	Inductance	Mr. B. NageswaraRao
5	19.03.2022	Electrical conductors and Insulators	Mr. B. NageswaraRao
6	21.03.2022	Ohm's law	Mr. B. NageswaraRao
7	22.03.2022	Series and parallel combinations of resistors	Mr. B. NageswaraRao
8	23.03.2022	Galvanometer	Mr. B. NageswaraRao
9	24.03.2022	Ammeter, Voltmeter	Mr. B. NageswaraRao
10	25.03.2022	Multimeter	Mr. B. NageswaraRao
11	26.03.2022	Practical Test-1	Mr. B. NageswaraRao
12	28.03.2022	Transformers	Mr. B. NageswaraRao
13	29.03.2022	Electrical energy	Mr. B. NageswaraRao
14	30.03.2022	Power, Kilowatt hour (kWh)	Mr. B. NageswaraRao
15	31.03.2022	consumption of electrical power	Mr. B. NageswaraRao
16	01.04.2022	Direct current and alternating current	Mr. B. NageswaraRao
17	04.06.2022	RMS and peak values, Power factor	Mr. B. NageswaraRao
18	06.04.2022	Single phase and three phase connections	Mr. B. NageswaraRao
19	07.04.2022	Practical Test-2	Mr. B. NageswaraRao
20	08.04.2022	Basics of House wiring	Mr. B. NageswaraRao
21	11.04.2022	Star and delta connection	Mr. B. NageswaraRao
22	12.04.2022	Electric shock, First aid for electric shock	Mr. B. NageswaraRao
23	13.04.2022	Overloading	Mr. B. NageswaraRao
24	16.04.2022	Earthing and its necessity	Mr. B. NageswaraRao
25	18.04.2022	Short circuiting , Fuses	Mr. B. NageswaraRao
26	19.04.2022	MCB , ELCB,	Mr. B. NageswaraRao
27	20.04.2022	Insulation, Inverter, UPS	Mr. B. NageswaraRao
28	21.04.2022	Practical session by an expert	Sri K. Vasu, Electrician
29	22.04.2022	Practical test-3	Mr. B. NageswaraRao
30	23.04.2022	Final Exam	Mr. B. NageswaraRao

B. N

K. V. S. Koteswara

IQAC COORDINATOR
SGK GOVT DEGREE COLLEGE, VINUKONDA
PALNADU DIST - 522 647

SGK GOVT DEGREE COLLEGE * VINUKONDA, PALNADU DIST. *

Principal
SGK Govt. Degree College
Vinukonda - 522647
Palnadu Dist., A.P.

LIST OF STUDENTS ENROLLED WITH SIGNATURES

S. No	Reg. No	Name of the Student	Group	Signature
1	Y213099037	ANNANGI SANJEEV RAJU	I B. Sc (M.P.C)	A. Sanjeev Raju
2	Y213099038	CHANDA VENKATA RAMADEVI	I B. Sc (M.P.C)	Ch. V. Ramadevi
3	Y213099039	CHIRAMPALLI TULASI	I B. Sc (M.P.C)	Ch. Tulasi
4	Y213099040	GURRALA MANJULA RANI	I B. Sc (M.P.C)	G. Manjula Rani
5	Y213099041	KANDETI NAGA LAKSHMI	I B. Sc (M.P.C)	K. Nagalakshmi
6	Y213099042	MERAJOTHU BUJJI BABU NAIK	I B. Sc (M.P.C)	M. Bujji Babu Naik
7	Y213099044	PEDDEETI JOHN CHAITANYA KUMAR	I B. Sc (M.P.C)	P. J Chaitanya kumar
8	Y213099047	VEERISETTY PRASANNA VANI	I B. Sc (M.P.C)	V. Prasanna Vani
9	Y213099048	BAILADUGU TARAKA ARJUN	I B. Sc (M.P.Cs)	B. Taraka Arjun
10	Y213099049	BANKA GURAVAMMA	I B.Sc (M.P.Cs)	B. Guravamma
11	Y213099050	CHANGALA SAI VENKATA GANESH	I B.Sc (M.P.Cs)	Ch. Venkata Ganesh
12	Y213099051	DASARI RATNA KUMARI	I B.Sc (M.P.Cs)	D. Ratna kumari
13	Y213099052	GOPU VENKATESH	I B.Sc (M.P.Cs)	G. Venkatesh
14	Y213099053	JEEDIMALLA BHANU PRASAD	I B.Sc (M.P.Cs)	J. Bhanu prasad
15	Y213099055	KANHARLA GAYATHRI	I B.Sc (M.P.Cs)	K. Gayathri
16	Y213099056	KISTAM CHANDRA SEKHAR	I B.Sc (M.P.Cs)	K. Chandra Sekhar
17	Y213099057	K. V. LAKSHMI PADMAVATHI	I B.Sc (M.P.Cs)	K.V.L. Padmavathi
18	Y213099058	MALAPATI KRUPARAJU	I B.Sc (M.P.Cs)	M. Krupa Raju
19	Y213099059	MANNEPALLI VENKATESH	I B.Sc (M.P.Cs)	M. Venkatesh
20	Y213099060	MUTUKURI KIRAN KUMAR	I B.Sc (M.P.Cs)	M. Kiran Kumar
21	Y213099062	ORSU GOPI	I B.Sc (M.P.Cs)	O. GOPI
22	Y213099063	PADARA VENKAT	I B.Sc (M.P.Cs)	P. Venkat
23	Y213099064	PALADUGU MAHESWARI	I B.Sc (M.P.Cs)	P. Maheswari
24	Y213099065	PALLEPOGU RAKESH	I B.Sc (M.P.Cs)	P. Rakesh
25	Y213099066	PASUMARTHI RAHIMUNNISA	I B.Sc (M.P.Cs)	P. Rahimunnisa
26	Y213099067	PEDDEETI DURGA PRASAD	I B.Sc (M.P.Cs)	P. Durga prasad
27	Y213099068	SETTI NAGALAKSHMAIAH	I B.Sc (M.P.Cs)	S. Nagalakshmaiah
28	Y213099069	SHAIK RAAFIYA	I B.Sc (M.P.Cs)	Sk. Raafiya
29	Y213099070	SHAIK ZAKIRA ROSHAN	I B.Sc (M.P.Cs)	Sk. Zakira Roshan
30	Y213099071	SHIAK IMRAN BASHA	I B.Sc (M.P.Cs)	Sk. Imran basha
31	Y213099072	VELPULA AKSHAYA BABU	I B.Sc (M.P.Cs)	V. Akshaya Babu
32	Y213099073	YADLAPALLI VASU	I B.Sc (M.P.Cs)	Y. Vasu

IQAC COORDINATOR
SGK GOVT DEGREE COLLEGE,VINUKONDA
PALNADU DIST - 522 647

SGK GOVT DEGREE COLLEGE * VINUKONDA, PALNADU DIST. *

Principal
SGK Govt. Degree College
Vinukonda - 522647
Palnadu Dist., A.P.

S. No	Name of the Student	14-03-2022	15-03-2022	16-03-2022	17-03-2022	19-03-2022	21-03-2022	22-03-2022	23-03-2022	24-03-2022	25-03-2022	26-03-2022	28-03-2022	29-03-2022	30-03-2022	31-03-2022
1	Annangi Sanjeev Raju	P	P	P	A	P	P	P	P	P	P	P	A	P	P	P
2	Chanda V Ramadevi	P	A	P	P	P	P	P	P	A	P	P	P	P	P	P
3	Chirampalli Tulasi	P	P	P	P	P	A	P	P	P	P	P	P	A	P	P
4	Gurrala Manjula Rani	P	P	A	P	P	P	A	P	P	P	P	P	P	P	A
5	Kandeti Naga Lakshmi	P	P	P	P	A	P	P	P	P	A	P	P	P	P	P
6	M. Bujji Babu Naik	P	P	P	P	P	P	P	A	P	P	P	P	P	P	A
7	P. J Chaitanya Kumar	P	P	P	A	P	P	P	P	P	P	A	P	P	P	P
8	V. Prasanna Vani	P	P	P	P	P	A	P	P	P	P	P	A	P	P	P
9	Bailadugu Taraka Arjun	P	P	A	P	P	P	P	P	A	P	P	P	P	P	P
10	Banka Guravamma	P	P	P	P	A	P	A	P	P	P	P	P	P	P	P
11	Ch. Sai Venkata Ganesh	P	P	A	P	P	P	P	A	P	P	P	P	P	P	P
12	Dasari Ratna Kumari	P	A	P	P	P	P	P	P	P	A	P	P	P	P	P
13	Gopu Venkatesh	P	P	P	P	P	A	P	P	P	P	P	P	P	P	P
14	Jeedimalla Bhanu Prasad	P	P	P	P	P	P	A	P	P	P	A	P	P	P	A
15	Kanharla Gayathri	P	P	P	P	P	P	P	A	P	P	P	A	P	P	P
16	Kistam Chandra Sekhar	P	P	A	P	P	P	P	P	P	P	P	P	A	P	P
17	K. V.L Padmavathi	P	A	P	P	A	P	P	P	P	A	P	P	P	P	P
18	Malapati Kruparaju	P	P	P	P	P	A	P	P	P	P	P	P	P	P	A
19	Mannepalli Venkatesh	P	P	P	P	P	P	A	P	P	P	A	P	P	P	P
20	Mutukuri Kiran Kumar	P	P	P	A	P	P	P	P	A	P	P	P	A	P	P
21	Orsu Gopi	P	P	A	P	P	P	P	P	P	P	P	A	P	P	P

S. No	Name of the Student	14-03-2022	15-03-2022	16-03-2022	17-03-2022	19-03-2022	21-03-2022	22-03-2022	23-03-2022	24-03-2022	25-03-2022	26-03-2022	28-03-2022	29-03-2022	30-03-2022	31-03-2022
22	Padara Venkat	P	P	P	A	P	P	P	P	P	A	P	P	P	A	P
23	Paladugu Maheswari	P	P	P	P	P	A	P	P	P	P	A	P	P	P	P
24	Pallepogu Rakesh	P	P	P	P	A	P	P	P	A	P	P	P	P	P	P
25	Pasumarthi Rahimunnisa	P	P	A	P	P	P	P	A	P	P	P	A	P	P	P
26	Peddeeti Durga Prasad	P	P	P	P	A	P	P	P	A	P	P	P	A	P	P
27	Setti Nagalakshmaiah	P	P	P	P	P	A	P	P	P	P	A	P	P	P	P
28	Shaik Raafiya	P	P	A	P	P	P	A	P	P	P	P	A	P	P	P
29	Shaik Zakira Roshan	P	P	P	P	A	P	P	P	A	P	P	P	P	A	P
30	Shiak Imran Basha	P	P	A	P	P	A	P	P	P	A	P	P	P	P	P
31	Velpula Akshaya Babu	P	P	P	P	A	P	P	P	P	P	A	P	P	A	P
32	Yadlapalli Vasu	P	P	A	P	P	A	P	P	P	A	P	P	P	P	P

IQAC COORADINATOR
SGK GOVT DEGREE COLLEGE, VINUKONDA
PALNADU DIST - 522 647

SGK GOVT DEGREE COLLEGE ★ VINUKONDA, PALNADU DIST. ★

Principal
SGK Govt. Degree College
Vinukonda - 522647
Palnadu Dist., A.P.

S. No	Name of the Student	01-04-2022	04-04-2022	06-04-2022	07-04-2022	08-04-2022	11-04-2022	12-04-2022	13-04-2022	16-04-2022	18-04-2022	19-04-2022	20-04-2022	21-04-2022	22-04-2022	23-04-2022	
1	Annangi Sanjeev Raju	P	P	P	A	P	P	P	P	A	P	P	P	P	P	P	
2	Chanda V Ramadevi	P	P	P	P	P	P	P	A	P	P	P	P	P	A	P	
3	Chirampalli Tulasi	P	P	P	P	A	P	P	P	P	P	P	A	P	P	P	
4	Gurrala Manjula Rani	P	P	P	P	P	P	A	P	P	P	P	P	A	P	P	
5	Kandeti Naga Lakshmi	P	A	P	P	P	P	P	A	P	P	P	A	P	P	A	
6	M. Bujji Babu Naik	P	P	P	P	P	A	P	P	A	P	P	P	P	P	P	
7	P. J Chaitanya Kumar	P	P	P	P	A	P	P	P	P	A	P	P	P	P	A	
8	V. Prasanna Vani	P	A	P	P	P	P	A	P	P	P	A	P	P	P	P	
9	Bailadugu Taraka Arjun	P	P	P	P	A	P	P	P	A	P	P	P	P	P	P	
10	Banka Guravamma	P	P	A	P	P	P	A	P	P	P	P	P	P	P	P	
11	Ch. Sai Venkata Ganesh	P	P	P	P	A	P	P	P	P	P	A	P	P	P	P	
12	Dasari Ratna Kumari	P	P	A	P	P	P	P	A	P	P	P	P	P	A	P	
13	Gopu Venkatesh	P	P	P	P	P	A	P	P	P	P	P	A	P	P	P	
14	Jeedimalla Bhanu Prasad	P	P	P	A	P	P	P	P	A	P	P	P	P	P	P	
15	Kanharla Gayathri	P	A	P	P	P	P	A	P	P	P	P	P	A	P	P	
16	Kistam Chandra Sekhar	P	P	P	P	P	A	P	P	P	P	A	P	P	P	P	
17	K. V.L Padmavathi	P	A	P	P	A	P	P	P	A	P	P	P	A	A	P	
18	Malapati Kruparaju	P	P	P	P	P	P	A	P	P	P	P	A	P	P	P	
19	Mannepalli Venkatesh	P	P	P	P	A	P	P	P	P	A	P	P	P	P	P	
20	Mutukuri Kiran Kumar	P	P	P	A	P	P	P	P	P	P	A	P	P	P	A	
21	Orsu Gopi	P	A	P	P	P	A	P	P	P	P	P	A	P	P	P	

S. No	Name of the Student	01-04-2022	04-04-2022	06-04-2022	07-04-2022	08-04-2022	11-04-2022	12-04-2022	13-04-2022	16-04-2022	18-04-2022	19-04-2022	20-04-2022	21-04-2022	22-04-2022	23-04-2022	
22	Padara Venkat	P	P	A	P	P	P	P	P	P	A	P	P	P	P	P	
23	Paladugu Maheswari	P	P	P	P	P	A	P	P	P	P	P	A	P	P	P	
24	Pallepogu Rakesh	P	P	P	A	P	P	P	A	P	P	P	P	A	P	P	
25	Pasumarthi Rahimunnisa	P	P	P	P	P	A	P	P	A	P	P	P	P	A	P	
26	Peddeeti Durga Prasad	P	P	A	P	P	P	P	A	P	P	P	P	P	P	P	
27	Setti Nagalakshmaiah	P	P	P	A	P	P	P	P	A	P	P	A	P	P	P	
28	Shaik Raafiya	P	P	A	P	A	P	P	P	P	P	A	P	P	P	P	
29	Shaik Zakira Roshan	P	P	P	P	P	A	P	P	P	A	P	P	P	P	P	
30	Shiak Imran Basha	P	P	A	P	A	P	P	P	P	A	A	P	P	P	P	
31	Velpula Akshaya Babu	P	P	P	P	P	P	A	P	A	P	P	P	P	P	P	
32	Yadlapalli Vasu	P	P	A	P	P	P	P	A	P	P	P	A	P	P	P	

K. V. Srikoteswara
IQAC COORDINATOR
SGK GOVT DEGREE COLLEGE, VINUKONDA
PALNADU DIST - 522 647

SGK GOVT DEGREE COLLEGE * VINUKONDA, PALNADU DIST. *

Principal
SGK Govt. Degree College
Vinukonda - 522647
Palnadu Dist., A.P.

Assessment

S. No	Name of the Student	Marks	Result
1	ANNANGI SANJEEV RAJU	75	PASS
2	CHANDA VENKATA RAMADEVI	75	PASS
3	CHIRAMPALLI TULASI	70	PASS
4	GURRALA MANJULA RANI	65	PASS
5	KANDETI NAGA LAKSHMI	80	PASS
6	MERAJOTHU BUJJI BABU NAIK	69	PASS
7	PEDDEETI JOHN CHAITANYA KUMAR	71	PASS
8	VEERISETTY PRASANNA VANI	80	PASS
9	BAILADUGU TARAKA ARJUN	60	PASS
10	BANKA GURAVAMMA	65	PASS
11	CHANGALA SAI VENKATA GANESH	70	PASS
12	DASARI RATNA KUMARI	75	PASS
13	GOPU VENKATESH	65	PASS
14	JEEDIMALLA BHANU PRASAD	80	PASS
15	KANHARLA GAYATHRI	70	PASS
16	KISTAM CHANDRA SEKHAR	60	PASS
17	KOTA VENKATA LAKSHMI	70	PASS
18	MALAPATI KRUPARAJU	68	PASS
19	MANNEPALLI VENKATESH	75	PASS
20	MUTUKURI KIRAN KUMAR	59	PASS
21	ORSU GOPI	65	PASS
22	PADARA VENKAT	66	PASS
23	PALADUGU MAHESWARI	80	PASS
24	PALLEPOGU RAKESH	68	PASS
25	PASUMARTHI RAHIMUNNISA	75	PASS
26	PEDDEETI DURGA PRASAD	68	PASS
27	SETTI NAGALAKSHMAIAH	66	PASS
28	SHAIK RAAFIYA	80	PASS
29	SHAIK ZAKIRA ROSHAN	76	PASS
30	SHIAK IMRAN BASHA	68	PASS
31	VELPULA AKSHAYA BABU	65	PASS
32	YADLAPALLI VASU	75	PASS

IQAC COORADINATOR
SGK GOVT DEGREE COLLEGE, VINUKONDA
PALNADU DIST - 522 647

Principal
SGK Govt. Degree College
Vinukonda - 522647
Palnadu Dist., A.P.

SGK GOVT DEGREE COLLEGE * VINUKONDA, PALNADU DIST. *

Evaluation:

Written Examination for 40 Marks (Written Exam)

Practical Examination for 60 Marks (Practical)

Assessment:

Students are assessed with a practical Exam conducted at the end of the course. The exam is conducted for 100 marks and the student has to score at least 50 marks to get the certificate. Three practical exams are conducted in the middle of the course in order to assess the students and act according to their learning levels.

IQAC COORADINATOR
SGK GOVT DEGREE COLLEGE, VINUKONDA
PALNADU DIST - 522 647

SGK GOVT DEGREE COLLEGE * VINUKONDA, PALNADU DIST.

Principal
SGK Govt. Degree College
Vinukonda - 522647
Palnadu Dist., A.P.

SGK GOVERNMENT DEGREE COLLEGE, VINUKONDA
PALNADU DISTRICT 522 647
An ISO 9001: 2015 Certified Institution, Affiliated to Acharya Nagarjuna University

BRIEF REPORT

Department of Computer Science organized a Certificate Course '**BASICS OF ELECTRICITY & HOUSE WIRING**. The duration of the course is 1 Month (30 Hours) and the course was conducted from **13.09.2021 to 27.10.2021**. This course is designed for people who want to learn the knowledge and skills they need to work in **Basics of electricity & House Wiring. 33**students of **I B. Sc (MPC), I B. Sc (MPCs)** registered in this course. Sri B. Nageswara Rao, Lecturer in physics acted as the Resource Person for this Course. During the course, students are evaluated using assignment, Quizzes and a final exam. All the 33 students successfully completed the course and received certificates of completion.

IQAC COORADINATOR
SGK GOVT DEGREE COLLEGE,VINUKONDA
PALNADU DIST - 522 647

SGK GOVT DEGREE COLLEGE * VINUKONDA, PALNADU DIST

Principal
SGK Govt. Degree College
Vinukonda - 522647
Palnadu Dist., A.P.

ELECTRICAL APPLIANCES

UNIT-1

Voltage:

Voltage or electric potential difference is an amount of work done between two points to bring unit positive charge in an electric field.

Voltage is then work from an electrical circuit's power source that pushes charged electrons (current) through a conducting loop.

Voltage would be –the ability to cause electricity to flow.‖

The work required to move per unit of charge between two points is known as voltage. Mathematically, the voltage can be expressed as,

Voltage = Work done (W)/Charge (Q)

SI units of Voltage are Volt.

Current:

Current is the rate at which electrons flow through a point in an electrical circuit.

An electric current is a stream of charged particles, such as electrons or ions, moving through an electrical conductor. It is measured as the net rate of flow of electric charge through a surface.

In electric circuits the charge carriers are often electrons moving through a wire. In semiconductors they can be electrons or holes.

Current I= Charge(Q)/Time(t)

SI units of current is Ampere

Ohms law:

–At Constant temperature, the Potential is directly proportional to current flowing through the conductor.‖ This is called Ohms law.

Potential α Current

$$V \alpha I$$

$$V=IR$$

This is called ohm’s law. Where, proportional constant R is called resistance of the conductor.

Resistance:

The electrical resistance of a circuit component or device is defined as the ratio of the voltage applied to the electric current which flows through it.

Resistance R= Voltage(V) /Current(I)

Resistance is a measure of the opposition to current flow in an electrical circuit.

SI units of resistance are Ohm (Ω).

The resistance of conducting material is found to be—

1. directly proportional to the length of the material
2. inversely proportional to the cross-sectional area of the material
3. depends on the nature of the material
4. It depends on the temperature

The resistance of a conductor is directly proportional to its length and inversely proportional to area of cross section.

$$R \alpha l/A$$

$$R=\rho l/A$$

Where L represents the length of the wire (in meters), A represents the cross-sectional area of the wire (in meters^2), and ρ represents the resistivity of the material (Ohm-meter).

$$\text{Resistivity } \rho=RA/l$$

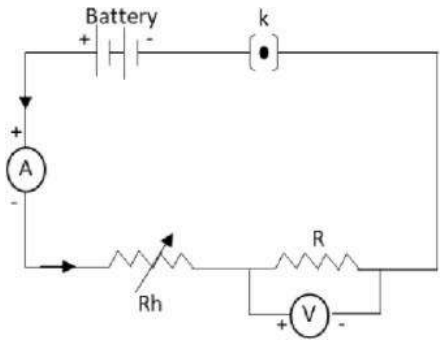
The resistivity is equal to the resistance of the conductor whose length is unit and unit area of cross section.

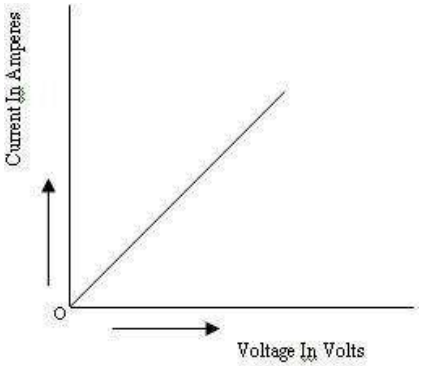
Verification of Ohms law:

To verify Ohms law circuit diagram is connected as shown in figure, In which Voltmeter V, ammeter A, Rheostat Rh, Resistance R along with battery B.

Initially, the key K is closed and the rheostat is adjusted to get the minimum reading in Ammeter A and voltmeter.

The current in the circuit is increased gradually by moving the sliding terminal of the rheostat. During the process, the current flowing in the circuit and the corresponding value of potential difference across the resistance R is recorded.





This way different sets of values of voltage and current are obtained.

For each set of values of V and I, the ratio of V/I is calculated.

When you calculate the ratio V/I for each case, you will come to notice that it is almost the same. So V/I = R, which is a constant.

Plot a graph of the current against the potential difference; it will be a straight line. This shows that the current is proportional to the potential difference. So Ohms law is verified.

Capacitance:

In a conductor, an electric charge is directly proportional to the potential difference.

Electric charge (Q) α Electric potential (V)

$$Q=CV$$

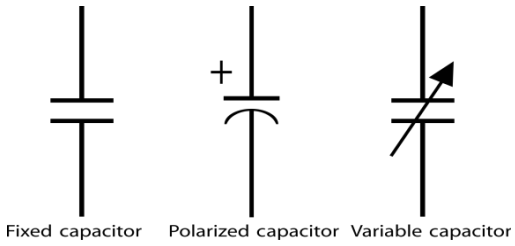
Where, the proportional constant C is called capacity or capacitance of the conductor.

$$\text{Capacitance } C=Q/V$$

Capacitance is the ratio of the amount of electric charge stored on a conductor to a difference in electric potential.

Units of capacitance are Farad.

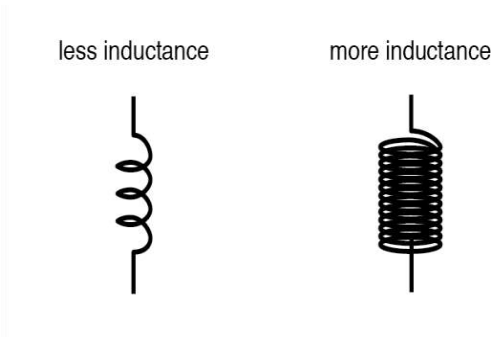
Farad is a big unit and hence micro farad (µF) or Pico Farad (pF) will be used as capacity units.



Inductance (L):

The flow of electric current creates a magnetic field around the conductor. The field strength depends on the magnitude of the current, and follows any changes in current. From Faraday's law of induction, any change in magnetic field through a circuit induces an electromotive force (EMF) (voltage) in the conductors, a process known as electromagnetic induction. This induced voltage created by the changing current has the effect of opposing the change in current.

Inductance is the tendency of an electrical conductor to oppose a change in the electric current flowing through it.



Lenz's law states that –The polarity of induced emf is such that it tends to produce a current which opposes the change in magnetic flux that produced it.‖

The magnetic flux linked with the circuit is proportional to Current flowing through it.

Magnetic flux(φ) αCurrent (I)

$\Phi = LI$

Where proportional constant L is called coefficient of self-induction or simply called self-inductance.

Self-inductance L=φ/I

Inductance is defined as the ratio of the magnetic flux linked with the circuit and current flowing through it.

The induced emf in a coil happens to be equal to the negative of the rate of change of magnetic flux times the number of turns that exist in the coil.

$$Induced\ emf\ e = \frac{d\varphi}{dt}$$

$$Induced\ emf\ e = \frac{d(LI)}{dt}$$

$$Induced\ emf\ e = L\frac{dI}{dt}$$

$$Coefficient\ of\ self\ inductance\ L = \frac{\varphi}{\frac{dI}{dt}}$$

Inductance is defined as the ratio of the induced voltage to the rate of change of current causing it.

SI units of self-inductance are Henry.

Electrical Conductors:

Depending on the electrical conductivity materials can be classified into three types

1. Conductors
2. Insulators
3. Semiconductors

Conductors:

Materials that allow electricity to flow through them easily are called conductors. This property of conductors that allow them to conduct electricity is known as conductivity.

- silver
- copper
- gold
- aluminum
- iron
- steel
- brass
- bronze
- mercury
- graphite
- sea water
- concrete

Insulators:

Materials that do not allow electricity to flow through them easily are called insulators.

- glass
- rubber
- oil
- asphalt
- fiberglass
- porcelain
- ceramic
- quartz
- (dry) cotton
- (dry) paper
- (dry) wood
- plastic
- air
- diamond
- pure water

Difference between Conductors and insulators:

Conductor	Insulator
Materials that permit electricity or heat to pass through it	**Materials that do not permit heat and electricityto pass through it**
A few examples of a conductor are silver, aluminum, and iron	**A few examples of an insulator are paper, wood,and rubber**
Electrons move freely within the conductor	**Electrons do not move freely with in the insulator**
The electric field exists on the surface but remainszero on the inside	**The electric field doesn't exist**

Series combination of Resisters:

Two or more resistances are said to be connected in series when they are connected end to end and the same current flows through each resistance is called series combination of resisters.

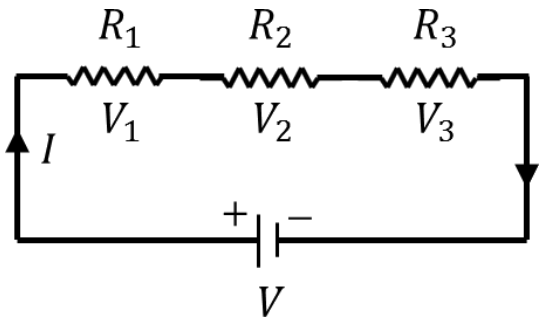
In series combination current through each resistor is constant. In series combination Potential difference across each resistor is different depending upon the value of resistance.

We know from Ohms law

V=IR, V_1=IR_1, V_2=IR_2 and V3=IR_3

But the potential difference

$V=V_1+V_2+V_3$



$IR= IR_1+ IR_2+ IR_3$

$R= R_1+ R_2+ R_3$

Equivalent resistance of circuit is equal to the sum of individual resistances in the series combination of resistances.

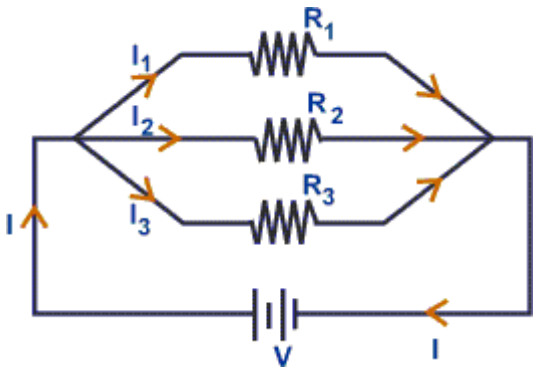
Parallel combination of Resisters:

Two or more resistances are said to be parallel connection when, first terminals are connected to one point and second terminals are connected to another point and having different current direction is called parallel combination of resisters.

We know from Ohms law

V=IR, $V=I_1R_1$, $V=I_2R_2$ and $V=I_3R_3$

$$I = \frac{V}{R} \text{ and } I_1 = \frac{V}{R_1}, I_2 = \frac{V}{R_2} \text{ and } I_3 = \frac{V}{R_3}$$



The potential difference across the two terminal points of the circuit remains the same.

The equivalent current through the circuit is the sum of individual currents through each branch of the circuit.

$$I=I_1+I_2+I_3$$

$$\frac{V}{R} = \frac{V}{R_1} + \frac{V}{R_2} + \frac{V}{R_3}$$

$$\frac{1}{R} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}$$

In parallel combination of resistances, The reciprocal of the resultant resistance is equal to the reciprocal of the individual resistances in a circuit.

Galvanometer:

A galvanometer is an instrument that can detect and measure small amounts of current in an electrical circuit.

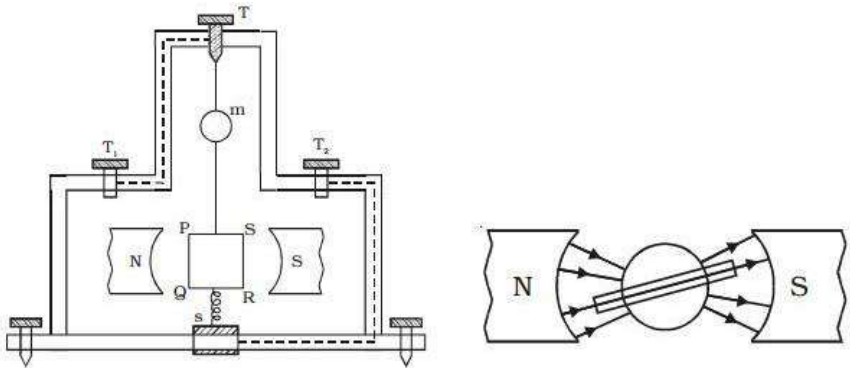
The moving coil galvanometer is made up of a rectangular coil that has many turns and it is usually made of thinly insulated or fine copper wire that is wounded on a metallic frame. The coil is free to rotate about a fixed axis. A phosphor-bronze strip that is connected to a movable torsion head is used to suspend the coil in a uniform radial magnetic field. Essential properties of the material used for suspension of the coil are conductivity and a low value of the torsional

constant. A cylindrical soft iron core is symmetrically positioned inside the coil to improve the strength of the magnetic field and to make the field radial.

The lower part of the coil is attached to a phosphor-bronze spring having a small number of turns. The other end of the spring is connected to binding screws. The spring is used to produce a counter torque which balances the magnetic torque and hence helps in producing a steady angular deflection. A plane mirror which is attached to the suspension wire, along with a lamp and scale arrangement, is used to measure the deflection of the coil. Zero-point of the scale is at the centre.

Working of Moving Coil Galvanometer

Let a current I flow through the rectangular coil of n number of turns and a cross-sectional area A. When this coil is placed in a uniform radial magnetic field B, the coil experiences a torque τ.



Let us first consider a single turn ABCD of the rectangular coil having a length l and breadth b. This is suspended in a magnetic field of strength B such that the plane of the coil is parallel to the magnetic field. Since the sides AB and DC are parallel to the direction of the magnetic field, they do not experience any effective force due to the magnetic field. The sides AD and BC being perpendicular to the direction of field experience an effective force F given by $F = BIl$

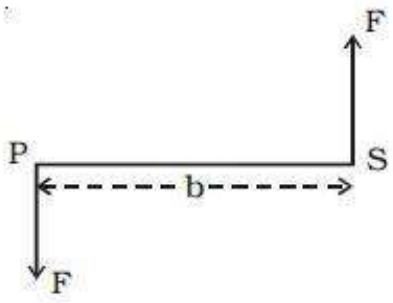
Using Fleming's left-hand rule we can determine that the forces on AD and BC are in opposite direction to each other. When equal and opposite forces F called couple acts on the coil, it produces a torque. This torque causes the coil to deflect.

We know that torque τ = force x perpendicular distance between the forces

$$\tau = F \times b$$

Substituting the value of F we already know,

Torque τ acting on single-loop ABCD of the coil = BIl × b



Torque τ acting on single-loop ABCD of the coil = BIA

Where lx b is the area A of the coil,

Hence the torque acting on n turns of the coil is given by

$$\tau = BIAn$$

The magnetic torque thus produced causes the coil to rotate, and the phosphor bronze strip twists. In turn, the spring S attached to the coil produces a counter torque or restoring torque kθ which results in a steady angular deflection.

Under equilibrium condition:

$$k\theta = BIAn$$

Here k is called the torsional constant of the spring (restoring couple per unit twist). The deflection or twist θ is measured as the value indicated on a scale by a pointer which is connected to the suspension wire.

$$\theta = (BAn / k)I$$

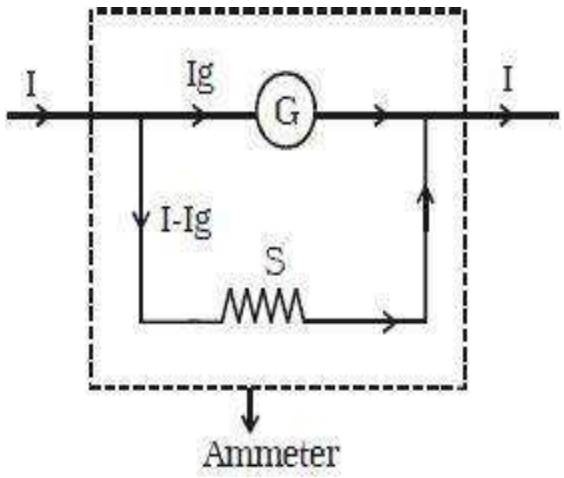
Therefore θ a I

The quantity BAn / k is a constant for a given galvanometer. Hence it is understood that the deflection that occurs the galvanometer is directly proportional to the current that flows through it.

Conversion of Galvanometer to Ammeter:

A galvanometer is converted into an ammeter by connecting it in parallel with a low resistance called shunt resistance. Suitable shunt resistance is chosen depending on the range of the ammeter.

In the given circuit



G – Resistance of the galvanometer

G- Galvanometer coil

I – Total current passing through the circuit

I_G – Total current passing through the galvanometer which corresponds to full-scale reading

S – Value of shunt resistance

When current I_G passes through the galvanometer, the current through the shunt resistance is given by $I_S = I - I_G$. The voltages across the galvanometer and shunt resistance are equal due to the parallel nature of their connection.

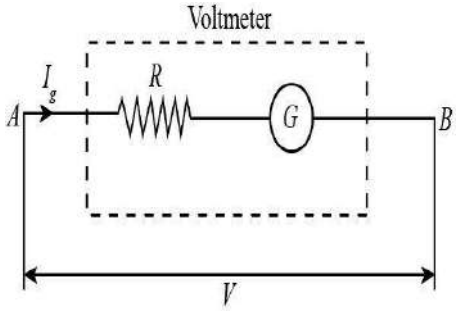
Therefore $G.I_G = (I - I_G).S$

The value of S can be obtained using the above equation.

Conversion of Galvanometer to Voltmeter:

A galvanometer is converted into a voltmeter by connecting it in series with high resistance. A suitable high resistance is chosen depending on the range of the voltmeter.

In the given circuit



G = Resistance of the galvanometer

R = Value of high resistance

G = Galvanometer coil

I = Total current passing through the circuit

I_G = Total current passing through the galvanometer which corresponds to a full-scale deflection.

V = Voltage drop across the series connection of galvanometer and high resistance.

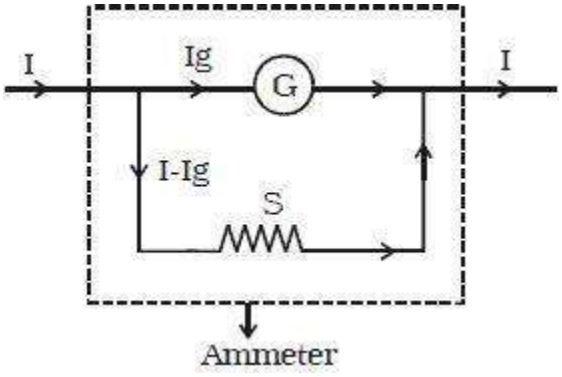
When current IG passes through the series combination of the galvanometer and the high resistance R; the voltage drop across the branch ab is given by

$$V = GI_G + R.I_G$$

The value of R can be obtained using the above equation.

Multimeter:

A multimeter is a measuring instrument that can measure multiple electrical properties. A typical multimeter can measure voltage, resistance, and current, in which case it is also known as a volt-ohm-milli ammeter (VOM), as the unit is equipped with voltmeter, ammeter, and ohmmeter functionality. Some feature the measurement of additional properties such as temperature and volume.



Analog multimeters use a microammeter with a moving pointer to display readings. Digital multimeters (DMM, DVOM) have numeric displays and have made analog multimeters obsolete as they are cheaper, more precise, and more physically robust than analog multimeters.

Digital Multimeter gives accurate measurements, consistent, reliable performance, attention to safety and the strongest warranty available.

Unit-2

Transformer:

A transformer is a passive component that transfers electrical energy from one electrical circuit to another circuit, or multiple circuits. A varying current in any one coil of the transformer produces a varying magnetic flux in the transformer's core, which induces a varying electromotive force across any other coils wound around the same core. Electrical energy can be transferred between separate coils without a metallic (conductive) connection between the two circuits.

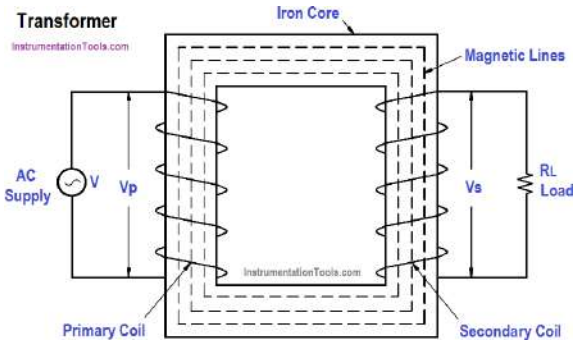
Transformers are most commonly used for increasing low AC voltages at high current (a step-up transformer) or decreasing high AC voltages at low current (a step-down transformer).

By Faraday's law of induction

$$Induced\ emf\ E = N\frac{d\varphi}{dt}$$

In case of primary circuit

$$Induced\ emf\ E_P = N_P\frac{d\varphi}{dt}$$



In case os secondary circuit

$$Induced\ emf\ E_s = N_s\frac{d\varphi}{dt}$$

From the above two equations

$$\frac{E_P}{E_s} = \frac{N_P}{N_s} = a$$

Where:

E_P – is the Primary Voltage

E_S – is the Secondary Voltage

N_P – is the Number of Primary Windings

N_S – is the Number of Secondary Windings

Where for a step-down transformer a > 1, for a step-up transformer a < 1, and for an isolation transformer a = 1.

Electrical Energy

Electrical energy is energy derived as a result of movement of electrically charged particles. This energy is supplied by the combination of electric current and electric potential that is delivered by an electrical circuit.

Electrical energy used in a resistance is equal to energy liberated from the resistance.

$$Energy\ Q = E = I^2Rt$$

Or

$$Energy\ Q = E = IVt$$

Where V=IR

The basic unit of electrical energy is the joule or watt-second.

1 kwh = 36×10^5 Ws or Joules

Power(P):

The rate of transfer of electrical energy by an electrical circuit is called electrical power.

Or

The transfer of electrical energy per unit time in an electrical circuit is called electrical power.

SI Units of Power is Watt.

$Power\ P = I^2R$

$Power\ P = VI$

The watt is the rate of energy conversion and it is equivalent to one joule per second.

Electrically one watt is equal to an amount of work done when one Ampere of current flowing and one Volt of voltage exists in a circuit.

Commercial units of electrical power is Horse Power (HP)

1HP=746W

Kilo watt hour (KWH):

Kilo watt Hour is a unit of electrical energy.

$1KWH = 1x1000x\text{W}x3600sec$

$1KWH = 3600000\text{W}sec$

$1KWH = 3.6x10^3\text{W}sec$

$1KWH = 3.6x10^3J$

Consumption of Electric Power:

Electric energy consumption is the form of energy consumption that uses electric energy. Electric energy consumption is the actual energy demand made on existing electricity supply.

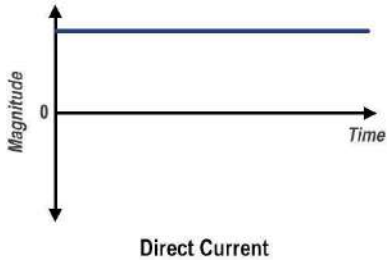
Electric devices and electronic devices consume electric energy to generate desired output.

The total consumption of electric energy can be divided into several categories, such as driving (electric motors), lighting, heating, communication, information, and others. Concerning the worldwide situation, it is estimated that electric motor driven systems (EMDSs) account for between 43% and 46% of the global electricity consumption. This amount is more than twice that of the second largest, which is lighting, contributing by 19% to the total consumption.

Direct Current:

Direct current (DC) is one-directional flow of electric charge. An electrochemical cell is a prime example of DC power. Direct current may flow through a conductor such as a wire, through semiconductors and insulators.

Direct current may be converted from an alternating current supply by use of a rectifier. Direct current may be converted into alternating current by using an inverter. Direct current has many uses, from the charging of batteries to large power supplies for electronic systems, motors, and more.



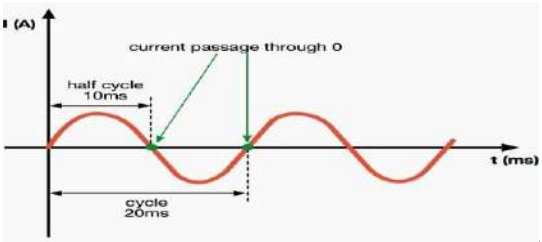
Direct Current

Very large quantities of electrical energy provided via direct-current are used in smelting of aluminum and other electrochemical processes. High-voltage direct current is used to transmit large amounts of power from remote generation sites or to interconnect alternating current power grids.

DC is commonly found in many low-voltage applications, especially where these are powered by batteries or solar power systems.

Alternating Current (AC)

Alternating current (AC) is an electric current which periodically reverses direction and changes its magnitude continuously with time.



Alternating current is sinusoidal or triangular or rectangular. The sinusoidal alternating current can be written as

$$Alternating\ current\ I = I_o Sin\ (\omega t + \varphi)$$

Where Io is maximum current, ω is angular frequency and φ is initial phase.

The main differences between AC and DC:

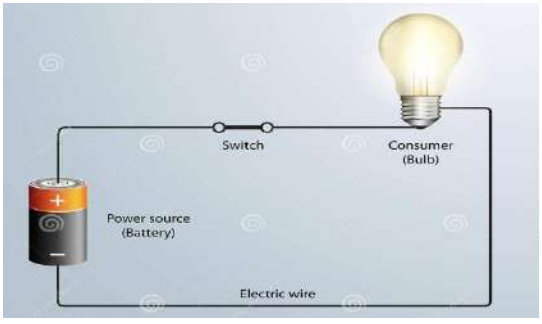
	Alternating Current (AC)	**Direct Current (DC)**
The direction of flow of current	When an alternating current flowing through a circuit, it reverses its direction.	When a direct current flowing through the circuit, it will not change the direction.
Frequency	The frequency of alternating current decides how many times it reverses its direction. If the frequency is 50 Hz, it means the current changes direction 50 times.	The frequency of the direct current is always zero. Because it never changes its direction.
Movement of Electron	Electrons keep changes its direction from forward to backward	Electrons move only in a forward direction.
Current magnitude	The magnitude of the instantaneous current is varying with time.	The magnitude is constant at each instant of time for pure DC. But it is variable for pulsating DC.
Power factor	It ranges between 0 and 1.	It is always 1.
Passive Parameter	Impedance (Combination of Reactance and Resistance).	Resistance only.
Types	Sinusoidal, Trapezoidal, Square, Triangular	Pure DC and Pulsating DC

Convert	It can convert from DC supply with the help of Invertor.	It can convert from AC supply with the help of a rectifier.
Source	AC Generator	DC Generator and battery
Dangerous	It is dangerous.	But it is more dangerous than AC for the same power rating.
Application	Most of the household, industrial and commercial equipment operate on DC.	Cell phones, Electric Vehicle, Electroplating, Flashlight, etc.

Single Phase Connection:

The alternating current power supply can be classified into single-phase(1-phase) and three-phase(3-phase). In general, a single-phase power is used where electricity requirement is low. In short, it is for running small equipment. The three-phase power carries a heavy load and can run large machinery in factories.

When it comes to single phase vs three phase, the main difference is that the former is used for household electricity requirements and the latter one is used to run heavy machinery.



In single phase electricity, the supply voltage of the power changes simultaneously. In general, a single-phase current is called ‑residential voltage‖ because it is mostly used in homes.

When it comes to distributing power, a single-phase connection uses neutral and phase wires. The neutral wire acts as a returning path for the current and the phase wires carry the load.

In a single-phase connection, the voltage starts at 230 Volts and has a frequency of about 50 Hertz. Because the voltage in a single-phase connection rises and falls constantly, constant power isn't delivered to the load. Let's discuss the advantages and disadvantages of using a single-phase power.

Advantages

Single-phase connections are intended for domestic supplies and residential homes. That's because, most of the appliances require a small amount of electricity to perform such as television, lights, fans, refrigerator, etc.

The functioning of a single-phase connection is simple and ordinary. It comprises a compact and lightweight unit where the flow of electricity through the wires will be lower if the voltage is higher.

Because of the reduction in power, it ensures that the power from a single-phase connection operates at optimum and transmit power effectively.

A single-phase connection work best with units for up to 5 Horse Power.

Disadvantages

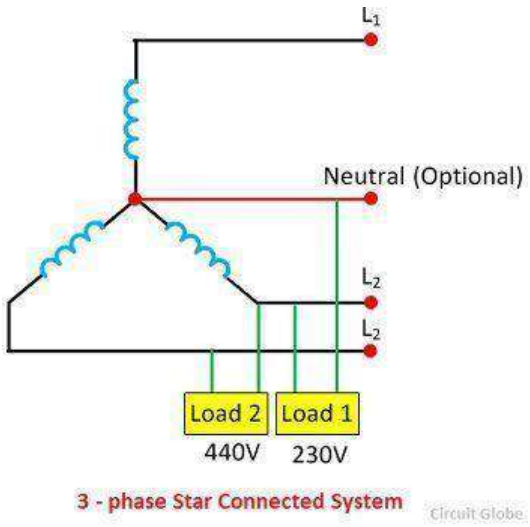
Heavy equipment such as industrial motors and other machinery alike cannot run by using a single-phase power supply.

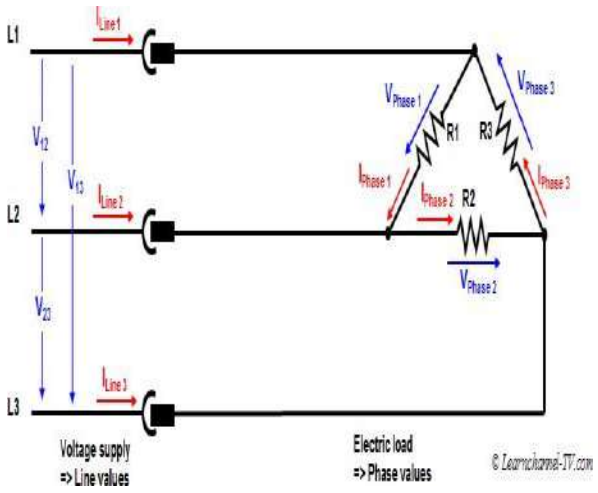
Small motors, which are less than single Kilowatt cannot run on a single-phase power supply because of the absence of initial torque required by the motor. So, for the smooth running of the motor, extra equipment called a motor starter is required.

Three Phase connections:

The three phases connection system contains the current will pass through the three wires, and there will be one neutral wire for passing the fault current to the earth. In other words, the system which uses three wires for generation, transmission and distribution is known as the three phase system. It means the three-phase system has four wires, i.e., the three current carrying conductors and the one neutral.

The three-phase systems are connected in two ways, i.e., the star connection and the delta connection.





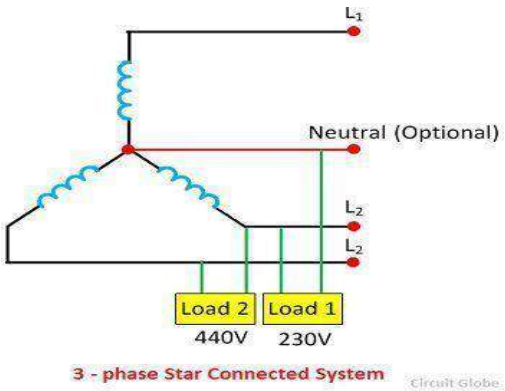
The three phase system induces in the generator which gives the three phase voltage of equal magnitude and frequency. The sum of the line currents in the 3-phase system is equal to zero, and their phases are differentiated at an angle of 120º. It provides an uninterruptible power, i.e., if one phase of the system is disturbed, then the remaining two phases of the system continue supplies the power. The magnitude of the current in one phase is equal to the sum of the current in the other two phases of the system.

The three-phase system has several advantages like it requires fewer conductors as compared to the single phase system. It also gives the continuous supply to the load. The three-phase system has higher efficiency and minimum losses.

Star Connection:

The three-phase systems are connected in two ways, i.e., the star connection and the delta connection.

The star connection requires four wires in which there are three phase conductors and one neutral conductor. Such type of connection is mainly used for long distance transmission because it has a neutral point. The neutral point passes the unbalanced current to the earth and hence makes the system balance.

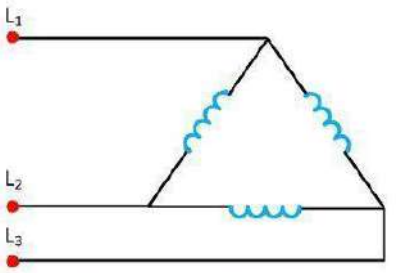


3 - phase Star Connected System

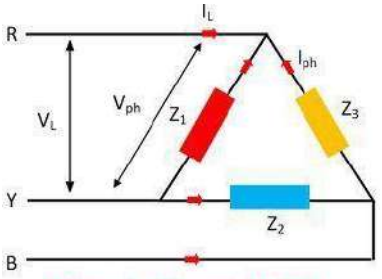
The star connected three phase systems gives two different voltages, i.e., the 230 V and 440V. The voltage between the single phase and the neutral is 230V, and the voltage between the two phases is equal to the 440V.

Delta Connection

The delta connection has three wires, and there is no neutral point. The delta connection is shown in the figure below. The line voltage of the delta connection is equal to the phase voltage.



3 - Phase Delta Connection



3 - Phase Load Connected in Delta

The three phase load may be balanced or unbalanced. If the three loads (impedances) Z_1, Z_2 and Z_3 have the same magnitude and phase angle then the three phase load is said to be a balanced load. Under balance condition, all the phases and the line voltages are equal in magnitude.

Unit-3

Basics of House Wiring

1. Electrical Service Connection and Meter

Home electricity starts with the power service and electric meter. The meter measures the amount of electricity your home uses and is the basis for the charges on your electric bill. The meter runs only when electricity is used in the house.

2. Disconnect Switch

Some home electrical systems include a dedicated disconnect switch that is mounted on an outside wall of the home near the electric meter. In the event of a fire or flash flood, or if work needs to be done on the system, a disconnect switch allows you to shut off the power from outside the home so you don't have to enter the home to turn off the power.

3. Main Service Panel

After passing through the meter, your electrical service feeds into your home's main service panel, commonly known as the breaker box. Two large "hot" wires connect to big screw terminals, called lugs, inside the service panel, providing all the power to the panel. A third service wire, the neutral, connects to the neutral bus bar inside the panel.

4. Main Circuit Breaker

The service panel contains a large main breaker that is the switch controlling the power to the rest of the circuit breakers inside the panel. It is sized according to your home's service capacity A main breaker of 200 amps will allow a maximum of 200 amps to flow through it without tripping. In a tripped state, no current will flow to the panel.

5. Branch Circuit Breakers

The breakers for the branch circuits fill the panel (usually below) the main breaker. Each of these breakers is a switch that controls the flow of electricity to a branch circuit in the house.

Turning off a breaker shuts off the power to all of the devices and appliances on that circuit. If a circuit has a problem, such as an overload or a fault, the breaker automatically trips itself off.

6. **Devices**

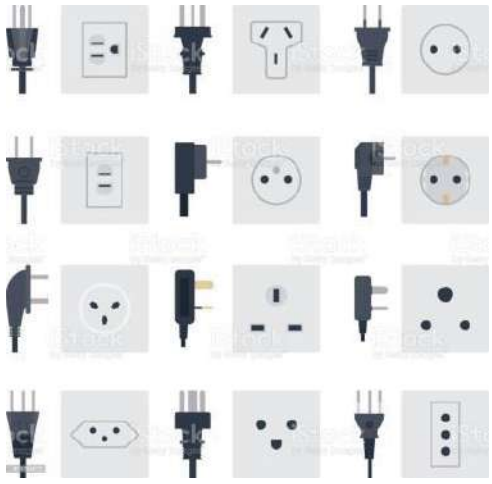
Devices are all the things in the house that are connected to electricity, including switches, receptacles (outlets), light fixtures, refrigerators, furnaces, and water heaters and appliances. Devices are connected to the individual branch circuits that start at the breakers in the main service panel.

7. **Switches**

Switches are the devices that turn on and off lights and fans in your home. They come in many different styles and colors to suit your design needs. There are single-pole, two-way, three-way, four-way, and dimmer switches. When you flip a switch off, it "opens" the circuit, meaning the circuit is broken or not complete and the power is interrupted. When the switch is on, the circuit is "closed," and power flows beyond the switch to the light or another device it is controlling.

8. **Outlets**

Electrical outlets, technically called receptacles, provide power to plug-in devices and appliances. Televisions, lights, computers, freezers, vacuums and toasters are all good examples of devices that can be plugged into an outlet. Standard outlets in a home are either 15-amp or 20-amp; 20-amp outlets can provide more electricity without tripping a breaker.



9. **Wiring**

Your home's wiring consists of a few different types of wiring, including non-metallic cable (commonly called Romex), Box cable, and wiring concealed in conduit. NM cable is the most common type of circuit wiring. It is suitable for use in dry, protected areas (inside stud walls, on the sides of joists, etc.) that are not subject to mechanical damage or excessive heat.

Electric Shock

Like salt water and metal, the human body is a conductor of electricity. Therefore, it's important to avoid situations where you might come into contact with electricity. An electric shock occurs when a person comes into contact with an electrical energy source. Electrical energy flows through a portion of the body causing a shock. Exposure to electrical energy may result in no injury at all or may result in devastating damage or death.

Burns are the most common injury from electric shock. Adolescents and adults are prone to high voltage shock caused by mischievous exploration and exposure at work. Low voltage electricity may result in only superficial burns or possibly more severe injuries depending on the variables above. Exposure to high voltage electricity (greater than 500 volts) has the potential to result in serious damage.

If you are going to help someone who has sustained a high voltage shock, you need to be very careful that you don't become a second victim of a similar electrical shock. If a high voltage line has fallen to the ground, there may be a circle of current spreading out from the tip of the line. A victim who has fallen from a height or sustained a severe shock causing multiple jerks may have a serious neck injury and should not be moved without first protecting the neck.

Following a low-voltage shock, go to the emergency department for the following concerns:

1. Any noticeable burn to the skin
2. Any period of unconsciousness
3. Any paralysis, vision, hearing, or speech problems
4. Confusion
5. Difficulty breathing
6. Injury may occur to muscles, the heart, or the brain from the electricity or to any bones or other organs from being thrown from the electric source.

First Aid for Electric Shock Victims

1. Don’t touch them!
2. Unplug the appliance or turn off the power at the control panel.
3. If you can’t turn off the power, use a piece of wood, like a broom handle, dry rope or dry clothing, to separate the victim from the power source.
4. Do not try to move a victim touching a high voltage wire. Call for emergency help.
5. Keep the victim lying down. Unconscious victims should be placed on their side to allow drainage of fluids. Do not move the victim if there is a suspicion of neck or spine injuries unless absolutely necessary.
6. If the victim is not breathing, apply mouth-to-mouth resuscitation. If the victim has no pulse, begin cardio pulmonary resuscitation (CPR). Then cover the victim with a blanket to maintain body heat, keep the victim’s head low and get medical attention.

Over Loading

Overloading of an electric circuit means when current flows in a circuit it becomes more than the capacity of components in the circuit to resist the current. When too much current passes an electric overload occurs through electric wires. This results in the heat in the wire and the wire gets melted moreover it increases the risk of fire.

PRECAUTIONS SHOULD BE TAKEN FOR OVERLOADING IS GIVEN BELOW:

1. Avoid using too many appliances at the same time.
2. Make sure the appliance you are using must be within the safe limit of the electric circuit.
3. Avoid connecting too many appliances in one socket.
4. Electric fuse should be connected in series, it will protect the circuit from overloading and short circuiting.
5. Proper earthing of all electric circuits must be done.

OVERLOADING SIGNS:

1. Flickering, blinking of lights
2. Burning odor

3. Warm or discolored wall plates.
4. Mild shock or tingle from switches.

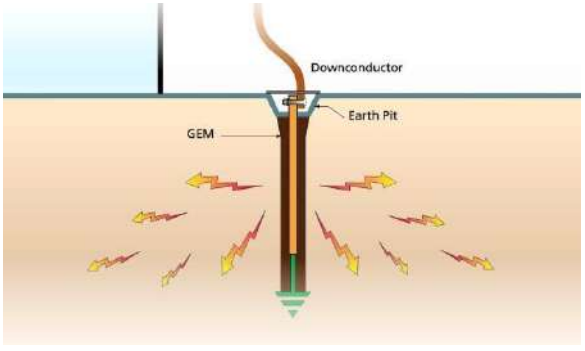
Continued overload can result from defective motors, overloaded equipment or we can say too many loads on one circuit. Such overloads are destructive and must be cut off by protective devices as soon as possible before they damage the circuit.

There is a key difference between short circuit and overloading that is;

When the neutral and the live wire come in contact with each other the short circuit takes place whereas when the number of equipment connected to one socket the overloading takes place.

Earthing and its necessity

Earthing is system in which the part of the equipment is connected to the earth with the help of the wires or cables. Earthing is also known as the grounding system. Earthing is defined as the disharge of electric current in the earth with the help of the wires or cables having low resistance. Mostly Galvanised iron (G.I) strips are used for the earthing. Earthing protects the humans from getting electric shock from the leakage current and when a live wire or cable comes in the contact of the body of the equipment or from the short circuit current.



It also causes the protective device (either a circuit-breaker or fuse) to switch off the electric current to the circuit that has the fault.

For example, if a cooker has a fault, the fault current flows to earth through the protective (earthing) conductors. A protective device (fuse or circuit-breaker) in the consumer unit switches off the electrical supply to the cooker. The cooker is now safe from causing an electric shock to anyone who touches it.

Types of Earthing

There are two types of earthing in electrical system:-

1. Pipe earthing
2. Plate earthing
3. Chemical earthing

Pipe earthing

A galvanized steel and a perforated pipe of approved length and diameter is placed vertically in a wet soil in this kind of system of earthing. It is the most common system of earthing.

Plate earthing

In plate earthing system, a plate made up of either copper with dimensions 60cm x 60cm x 3.18mm or galvanized iron (GI) of dimensions 60cm x 60cm x 6.35 mm (2ft x 2ft x ¼ in) is buried vertical in the earth which should not be less than 3m (10ft) from the ground level.

Chemical earthing

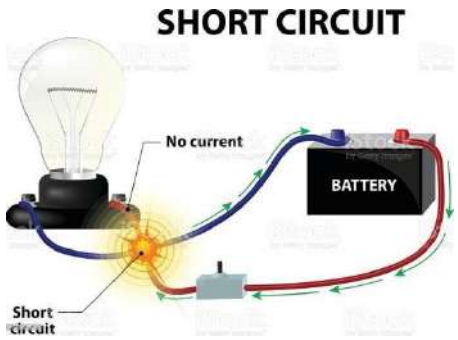
Chemical earthing is recently introduced. In this type of earthing arrangements are same like pipe earthing but the charcoal and salt replaced by the chemical. In this type of earthing there is less chance of loosing resistivity and also demands less maintenace as compared to other type of earthing.

Short circuiting

A short circuit is an abnormal condition in an electrical circuit where the electrical current flows through an unintended, shorter pathway instead of following the circuit.

It can cause serious damage, fire, and even small-scale explosions. In fact, short circuits are one of the leading causes of structural fires around the world.

There are number of factors that can lead to a short circuit. Here are some of the most common causes.



1. The wiring encounters water or some other liquid.
2. Faulty insulation or loose connections can result in the live and neutral wires coming in contact with each other.
3. Nail and screw punctures that cause the wire casings to deteriorate.
4. An abnormal build-up of electrical currents within your home's electrical wiring system.
5. Common pests like rats, mice, and squirrels, chew the wires.
6. Old or malfunctioning appliances with damaged plugs or power cords can also cause a short circuit. That's because when an appliance is plugged into a wall outlet its wiring essentially becomes an extension of the circuit.

Protection against Short Circuits

Short circuits pose a danger of shock and fire. Fortunately, your home's wiring system has various means in place to safeguard against these dangers.

Circuit breakers or fuses use an internal system of springs or compressed air to detect changes in electrical current flow. They are designed to break the circuit connection when any irregularity occurs.

Fuses

In electronics and electrical circuits, a fuse is an electrical safety device that operates to provide overcurrent protection of an electrical circuit. Its essential component is a metal wire or strip that melts when too much current flows through it, thereby stopping or interrupting the current.

The Fuse is made up of a material which has high resistivity and low melting point, so that it melts down due to overheating of the wire during high current flow. The thickness of the Fuse wire is determined based on the amount of current flow in the circuit. Normally an alloy of tin and lead is used as the Fuse wire, as it has high resistivity and low melting point.

Working Principle

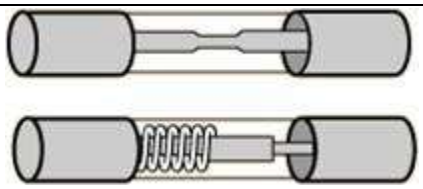
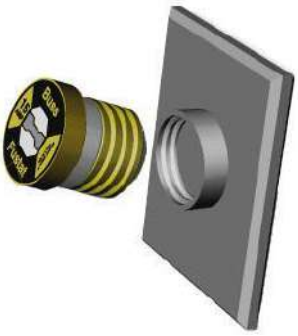
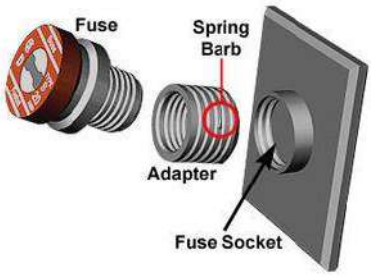
The Electric Fuse works on the basis of the heating effect of the Electric Current. It is composed of a non-flammable thin metallic wire with a low melting point.

If a high amount of Electricity is passed from the Electric Fuse, there is a production of heat which causes the Fuse to melt which leads to the opening of the Circuit and the blockage of Current.

Once a Fuse melts, it can be changed or replaced with a new Fuse.

A Fuse is normally made up of elements like zinc, copper, aluminum and silver.

A Fuse acts as a circuit breaker and breaks the circuit in case any fault occurs in the circuit. It acts as a protector of Electric appliances and also as a safety measure for humans.

Fuse type	Description	**Picture**
Cartridge	Contains a thin conductor designed to melt at a low temperature. Once the current reaches a level that can generate enough heat to match or surpass the designed melting point, the connection will break.	
Blade	Contains two electrical connectors that plug into a circuit and a wire inside that will melt at a certain current.	
Plug	Screwed directly into a standard fuse socket.	
Adapter	Referred to as a rejection base (also called type-S), it requires an adapter to fit into a standard fuse socket. Once it is installed it cannot be removed.	

MCB (Miniature Circuit Breakers)

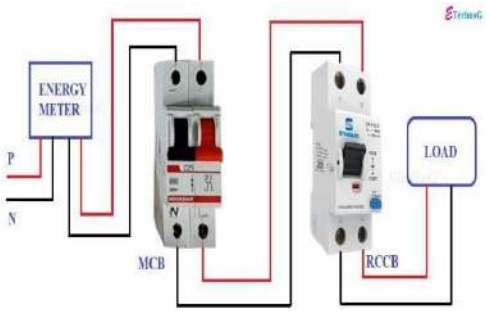
MCB stands for Miniature Circuit Breakers. The MCB is an electromechanical device that switches off the circuit automatically if an abnormality is detected. The MCB easily senses the over current caused by the short circuit. The miniature circuit has a very straight forward working principle.

If the current increases, the movable contacts are disconnected from the fixed contacts, making the circuit open and disconnects them from the main supply.

Working of Miniature Circuit Breaker (MCB)

Mini circuit breakers are triggered by over current - electrical current that exceeds a designated safe current and makes use of a relatively robust mechanical mechanism designed to minimize failures and false alarms.

Excess current causes the bimetallic strip within the MCB to heat, bends, and trip. This releases a switch which moves the electrical contact points apart to confine the arc (electrical discharge). The arc is divided and cooled by an insulated metal strip called the arc chute. The contacts close again once the fault has been fixed and the MCBs are reset.

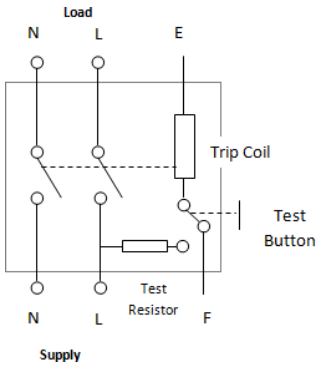


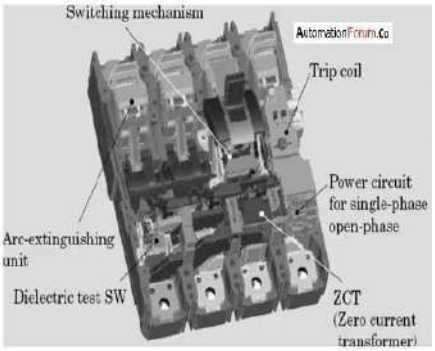
An MCB is designed to protect against both overloading and short-circuiting. These are detected differently using separate processes. Overload protection is provided by the bimetallic strip using thermal operation, whereas short-circuits protection is provided by the tripping coil via electro-magnetic operation.

If the discharge is especially high, the MCB will trip very quickly – within one-tenth of a second. When the over current is closer to the safety limits, the component will be slower to respond.

ELCB (Earth Leakage Circuit Breaker)

An Earth-leakage circuit breaker (ELCB) is a safety device used in electrical installations with high earth impedance to prevent shock. It detects small stray voltages on the metal enclosures of electrical equipment and interrupts the circuit if the voltage level exceeds danger threshold.





The main purpose of ELCB is to detect Earth leakages and prevent injury to human beings from electrical shocks and prevent electrical fires that are caused by short Circuit.

An ELCB is a specialized type of latching relay that has a building's incoming mains power connected through its switching contacts so that the ELCB disconnects the power in an earth leakage condition. The ELCB detects fault currents from live (hot) to the earth (ground) wire within the installation it protects. If high voltage appears across the ELCB's sense coil, it will switch off the power, and remain off until manually reset. Thus, protecting the electrical system in the building.

ELCB Operation

An electrical circuit breaker is a particular kind of latching relay and it has a mains supply of buildings that are connected throughout its switching contacts so that this circuit breaker will disconnect the power once earth leakage is identified. By using this, the fault current can be detected from life to the ground wire in the fitting it guards. If ample voltage comes out across the sense coil of the circuit breaker, then it will shut down the power & remain off until physically reset. An ELCB which is used for voltage-sensing does not detect fault currents.

Insulation

Insulators have a high resistance, we can also describe them as having "low electrical conduction". Insulators come in solid, liquid and gas forms.

Clay (ceramic) - This is the standard material for high voltage and RF insulators.

Plastics - PVC, Cresyl Pthalate, DEHP and other plastics replaced rubber as an insulator for wires and other parts. PVC and nylon are now standard in most types of wire.



1. Glass (silica, soda ash and limestone) - This material worked fine for telegraph and other low voltage apparatus.
2. Paper/Cardboard - paper and cardboard are used as insulators in certain circumstances as these materials are cheap and can work in situations without high heat or high voltages.
3. Mica - This is a good stable material even when exposed to the elements. It is a good thermal conductor while being an insulator. Sheet mica is easily stamped and shaped for electrical components.
4. Teflon - Slippery, durable and resistant to corrosion this Dupont made material is used in cable jackets.
5. Rubber - Rubber in its natural and synthetic forms was used as an insulator from before the 1870s until the 1950s. Plastics (especially PVC) replaced rubber.
6. Wax and oil - in the 1880s Edison used trinidad asphaltum with linseed oil, beeswax and paraffin to insulate copper wires mounted inside of iron pipes. This was used for durable underground power lines. This was used at the famous Pearl Street Station in NYC.

Importance of Insulation

1. Electrical insulation is not only important, but necessary. The main reason for electrical insulation is to maintain safety and to avoid electric shock.

2. Electric shock can result in fatal injuries resulting from involuntary movement. It can also cause death from ventricular fibrillation (heart pumping problems) or muscle contraction.
3. In addition to preventing electric shock, insulation also protects the materials through which electric current flows. Electrical insulation limits current flow between different electrical conductors.

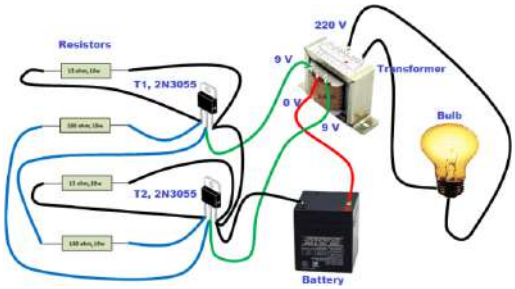
Application of Insulator

Since the Electrical Insulator materials bind the electrons tightly, it prevents the electrons from floating from atom to atom. Thus, they prevent the conduction of Electric charges. Given the benefits of there are multifold applications of the Electrical Insulator. They are applied to-

1. Circuit boards
2. Coating of Electric wires
3. High voltage appliances
4. Coating of cables
5. Coating for Electric poles on the streets

Invertor

An inverter is one of the most important devices in a solar energy system. It's a device that converts direct current (DC) electricity, which is what a solar panel generates, to alternating current (AC) electricity.



Fundamentally, an inverter accomplishes the DC-to-AC conversion by switching the direction of a DC input back and forth very rapidly. As a result, a DC input becomes an AC output. In addition, filters and other electronics can be used to produce a voltage that varies as a clean, repeating sine wave that can be injected into the power grid.

The basic circuits include an oscillator, control circuit, drive circuit for the power devices, switching devices, and a transformer.

The conversion of D.C to alternating voltage is achieved by converting energy stored in the dc source such as the battery, or from a rectifier output, into an alternating voltage. This is done using switching devices which are continuously turned on and off, and then stepping up using the transformer.

Uninterruptible Power Supply (UPS)

An uninterruptible power supply or uninterruptible power source (UPS) is an electrical apparatus that provides emergency power to a load when the input power source or mains power fails.

In a UPS, the energy is generally stored in flywheels, batteries, or super capacitors. When compared to other immediate power supply system, UPS have the advantage of immediate protection against the input power interruptions.

A UPS is typically used to protect hardware such as computers, data centers, telecommunication equipment or other electrical equipment where an unexpected power disruption could cause injuries, fatalities, serious business disruption or data loss.

Most UPS units are also capable of correcting common utility power problems:

1. Voltage spike or sustained overvoltage
2. Momentary or sustained reduction in input voltage
3. Voltage sag
4. Noise, defined as a high frequency transient or oscillation, usually injected into the line by nearby equipment
5. Instability of the mains frequency.

SGK GOVERNMENT DEGREE COLLEGE VINUKONDA

(Affiliated to Acharya Nagarjuna University, Guntur)

Guntur District, Andhra Pradesh, India-522647

Estd:1980

CERTIFICATE

This Certificate is awarded to **VELPULA AKSHAYA BABU, I B.Sc (M.P.Cs),** with Registration No. **Y213099072,** SGK Govt. Degree College, Vinukonda for completed and passed the **BASICS OF ELECTRICITY AND HOUSE WIRING** certificate course during 14.03.2022 to 23.04.2022 Conducted by Department of Physics, SGK Government. Degree College, Vinukonda.

Sri. B. Nageswararao
CONVENER

Dr. K. Srinivasa Rao
PRINCIPAL

SGK GOVERNMENT DEGREE COLLEGE VINUKONDA

(Affiliated to Acharya Nagarjuna University, Guntur)

Guntur District, Andhra Pradesh, India-522647

Estd:1980

CERTIFICATE

This Certificate is awarded to **SHIAK IMRAN BASHA, I B.Sc (M.P.Cs),** with Registration No. **Y213099071,** SGK Govt. Degree College, Vinukonda for completed and passed the **BASICS OF ELECTRICITY AND HOUSE WIRING** certificate course during 14.03.2022 to 23.04.2022 Conducted by Department of Physics, SGK Government. Degree College, Vinukonda.

Sri. B. Nageswararao
CONVENER

Dr. K. Srinivasa Rao
PRINCIPAL

SGK GOVERNMENT DEGREE COLLEGE VINUKONDA

(Affiliated to Acharya Nagarjuna University, Guntur)

Guntur District, Andhra Pradesh, India-522647

Estd:1980

CERTIFICATE

This Certificate is awarded to **SHAIK ZAKIRA ROSHAN, I B.Sc (M.P.Cs),** with Registration No. **Y213099070,** SGK Govt. Degree College, Vinukonda for completed and passed the **BASICS OF ELECTRICITY AND HOUSE WIRING** certificate course during 14.03.2022 to 23.04.2022 Conducted by Department of Physics, SGK Government. Degree College, Vinukonda.

Sri. B. Nageswararao
CONVENER

Dr. K. Srinivasa Rao
PRINCIPAL

SGK GOVERNMENT DEGREE COLLEGE VINUKONDA

(Affiliated to Acharya Nagarjuna University, Guntur)

Guntur District, Andhra Pradesh, India-522647

Estd:1980

CERTIFICATE

This Certificate is awarded to **SHAIK RAAFIYA, I B.Sc (M.P.Cs),** with Registration No. **Y213099069,** SGK Govt. Degree College, Vinukonda for completed and passed the **BASICS OF ELECTRICITY AND HOUSE WIRING** certificate course during 14.03.2022 to 23.04.2022 Conducted by Department of Physics, SGK Government. Degree College, Vinukonda.

Sri. B. Nageswararao
CONVENER

Dr. K. Srinivasa Rao
PRINCIPAL

SGK GOVERNMENT DEGREE COLLEGE VINUKONDA

(Affiliated to Acharya Nagarjuna University, Guntur)

Guntur District, Andhra Pradesh, India-522647

Estd:1980

CERTIFICATE

This Certificate is awarded to **SETTI NAGALAKSHMAIAH, I B.Sc (M.P.Cs),** with Registration No. **Y213099068,** SGK Govt. Degree College, Vinukonda for completed and passed the **BASICS OF ELECTRICITY AND HOUSE WIRING** certificate course during 14.03.2022 to 23.04.2022 Conducted by Department of Physics, SGK Government. Degree College, Vinukonda.

Sri. B. Nageswararao
CONVENER

Dr. K. Srinivasa Rao
PRINCIPAL

SGK GOVERNMENT DEGREE COLLEGE VINUKONDA

(Affiliated to Acharya Nagarjuna University, Guntur)

Guntur District, Andhra Pradesh, India-522647

Estd:1980

CERTIFICATE

This Certificate is awarded to **PEDDEETI DURGA PRASAD, I B.Sc (M.P.Cs),** with Registration No. **Y213099067,** SGK Govt. Degree College, Vinukonda for completed and passed the **BASICS OF ELECTRICITY AND HOUSE WIRING** certificate course during 14.03.2022 to 23.04.2022 Conducted by Department of Physics, SGK Government. Degree College, Vinukonda.

Sri. B. Nageswararao
CONVENER

Dr. K. Srinivasa Rao
PRINCIPAL

SGK GOVERNMENT DEGREE COLLEGE VINUKONDA

(Affiliated to Acharya Nagarjuna University, Guntur)

Guntur District, Andhra Pradesh, India-522647

Estd:1980

CERTIFICATE

This Certificate is awarded to **PASUMARTHI RAHIMUNNISA, I B.Sc (M.P.Cs),** with Registration No. **Y213099066,** SGK Govt. Degree College, Vinukonda for completed and passed the **BASICS OF ELECTRICITY AND HOUSE WIRING** certificate course during 14.03.2022 to 23.04.2022 Conducted by Department of Physics, SGK Government. Degree College, Vinukonda.

Sri. B. Nageswararao
CONVENER

Dr. K. Srinivasa Rao
PRINCIPAL

SGK GOVERNMENT DEGREE COLLEGE VINUKONDA

(Affiliated to Acharya Nagarjuna University, Guntur)

Guntur District, Andhra Pradesh, India-522647

Estd:1980

CERTIFICATE

This Certificate is awarded to **PALLEPOGU RAKESH, I B.Sc (M.P.Cs),** with Registration No. **Y213099065,** SGK Govt. Degree College, Vinukonda for completed and passed the **BASICS OF ELECTRICITY AND HOUSE WIRING** certificate course during 14.03.2022 to 23.04.2022 Conducted by Department of Physics, SGK Government. Degree College, Vinukonda.

Sri. B. Nageswararao
CONVENER

Dr. K. Srinivasa Rao
PRINCIPAL

SGK GOVERNMENT DEGREE COLLEGE VINUKONDA

(Affiliated to Acharya Nagarjuna University, Guntur)

Guntur District, Andhra Pradesh, India-522647

Estd:1980

CERTIFICATE

This Certificate is awarded to **PALADUGU MAHESWARI**, **I B.Sc (M.P.Cs)**, with Registration No. **Y213099064**, SGK Govt. Degree College, Vinukonda for completed and passed the **BASICS OF ELECTRICITY AND HOUSE WIRING** certificate course during 14.03.2022 to 23.04.2022 Conducted by Department of Physics, SGK Government. Degree College, Vinukonda.

Sri. B. Nageswararao
CONVENER

Dr. K. Srinivasa Rao
PRINCIPAL

SGK GOVERNMENT DEGREE COLLEGE VINUKONDA

(Affiliated to Acharya Nagarjuna University, Guntur)

Guntur District, Andhra Pradesh, India-522647

Estd:1980

CERTIFICATE

This Certificate is awarded to **PADARA VENKAT, I B.Sc (M.P.Cs),** with Registration No. **Y213099063,** SGK Govt. Degree College, Vinukonda for completed and passed the **BASICS OF ELECTRICITY AND HOUSE WIRING** certificate course during 14.03.2022 to 23.04.2022 Conducted by Department of Physics, SGK Government. Degree College, Vinukonda.

Sri. B. Nageswararao
CONVENER

Dr. K. Srinivasa Rao
PRINCIPAL

SGK GOVERNMENT DEGREE COLLEGE VINUKONDA

(Affiliated to Acharya Nagarjuna University, Guntur)

Guntur District, Andhra Pradesh, India-522647

Estd:1980

CERTIFICATE

This Certificate is awarded to **ORSU GOPI, I B.Sc (M.P.Cs)**, with Registration No. **Y213099062**, SGK Govt. Degree College, Vinukonda for completed and passed the **BASICS OF ELECTRICITY AND HOUSE WIRING** certificate course during 14.03.2022 to 23.04.2022 Conducted by Department of Physics, SGK Government. Degree College, Vinukonda.

Sri. B. Nageswararao
CONVENER

Dr. K. Srinivasa Rao
PRINCIPAL

SGK GOVERNMENT DEGREE COLLEGE VINUKONDA

(Affiliated to Acharya Nagarjuna University, Guntur)

Guntur District, Andhra Pradesh, India-522647

Estd:1980

CERTIFICATE

This Certificate is awarded to **MUTUKURI KIRAN KUMAR, I B.Sc (M.P.Cs),** with Registration No. **Y213099060,** SGK Govt. Degree College, Vinukonda for completed and passed the **BASICS OF ELECTRICITY AND HOUSE WIRING** certificate course during 14.03.2022 to 23.04.2022 Conducted by Department of Physics, SGK Government. Degree College, Vinukonda.

Sri. B. Nageswararao
CONVENER

Dr. K. Srinivasa Rao
PRINCIPAL

SGK GOVERNMENT DEGREE COLLEGE VINUKONDA

(Affiliated to Acharya Nagarjuna University, Guntur)

Guntur District, Andhra Pradesh, India-522647

Estd:1980

CERTIFICATE

This Certificate is awarded to **MANNEPALLI VENKATESH, I B.Sc (M.P.Cs),** with Registration No. **Y213099059,** SGK Govt. Degree College, Vinukonda for completed and passed the **BASICS OF ELECTRICITY AND HOUSE WIRING** certificate course during 14.03.2022 to 23.04.2022 Conducted by Department of Physics, SGK Government. Degree College, Vinukonda.

Sri. B. Nageswararao
CONVENER

Dr. K. Srinivasa Rao
PRINCIPAL

SGK GOVERNMENT DEGREE COLLEGE VINUKONDA

(Affiliated to Acharya Nagarjuna University, Guntur)

Guntur District, Andhra Pradesh, India-522647

Estd:1980

CERTIFICATE

This Certificate is awarded to **MALAPATI KRUPARAJU, I B.Sc (M.P.Cs)**, with Registration No. **Y213099058,** SGK Govt. Degree College, Vinukonda for completed and passed the **BASICS OF ELECTRICITY AND HOUSE WIRING** certificate course during 14.03.2022 to 23.04.2022 Conducted by Department of Physics, SGK Government. Degree College, Vinukonda.

Sri. B. Nageswararao
CONVENER

Dr. K. Srinivasa Rao
PRINCIPAL

SGK GOVERNMENT DEGREE COLLEGE VINUKONDA

(Affiliated to Acharya Nagarjuna University, Guntur)

Guntur District, Andhra Pradesh, India-522647

Estd:1980

CERTIFICATE

This Certificate is awarded to **KOTA VENKATA LAKSHMI PADMAVATHI, I B.Sc (M.P.Cs),** with Registration No. **Y213099057,** SGK Govt. Degree College, Vinukonda for completed and passed the **BASICS OF ELECTRICITY AND HOUSE WIRING** certificate course during 14.03.2022 to 23.04.2022 Conducted by Department of Physics, SGK Government. Degree College, Vinukonda.

Sri. B. Nageswararao
CONVENER

Dr. K. Srinivasa Rao
PRINCIPAL

SGK GOVERNMENT DEGREE COLLEGE VINUKONDA

(Affiliated to Acharya Nagarjuna University, Guntur)

Guntur District, Andhra Pradesh, India-522647

Estd:1980

CERTIFICATE

This Certificate is awarded to **KISTAM CHANDRA SEKHAR, I B.Sc (M.P.Cs),** with Registration No. **Y213099056,** SGK Govt. Degree College, Vinukonda for completed and passed the **BASICS OF ELECTRICITY AND HOUSE WIRING** certificate course during 14.03.2022 to 23.04.2022 Conducted by Department of Physics, SGK Government. Degree College, Vinukonda.

Sri. B. Nageswararao
CONVENER

Dr. K. Srinivasa Rao
PRINCIPAL

SGK GOVERNMENT DEGREE COLLEGE VINUKONDA

(Affiliated to Acharya Nagarjuna University, Guntur)

Guntur District, Andhra Pradesh, India-522647

Estd:1980

CERTIFICATE

This Certificate is awarded to **KANHARLA GAYATHRI, I B.Sc (M.P.Cs),** with Registration No. **Y213099055,** SGK Govt. Degree College, Vinukonda for completed and passed the **BASICS OF ELECTRICITY AND HOUSE WIRING** certificate course during 14.03.2022 to 23.04.2022 Conducted by Department of Physics, SGK Government. Degree College, Vinukonda.

Sri. B. Nageswararao
CONVENER

Dr. K. Srinivasa Rao
PRINCIPAL

SGK GOVERNMENT DEGREE COLLEGE VINUKONDA

(Affiliated to Acharya Nagarjuna University, Guntur)

Guntur District, Andhra Pradesh, India-522647

Estd:1980

CERTIFICATE

This Certificate is awarded to **JEEDIMALLA BHANU PRASAD, I B.Sc (M.P.Cs),** with Registration No. **Y213099053,** SGK Govt. Degree College, Vinukonda for completed and passed the **BASICS OF ELECTRICITY AND HOUSE WIRING** certificate course during 14.03.2022 to 23.04.2022 Conducted by Department of Physics, SGK Government. Degree College, Vinukonda.

Sri. B. Nageswararao
CONVENER

Dr. K. Srinivasa Rao
PRINCIPAL

SGK GOVERNMENT DEGREE COLLEGE VINUKONDA

(Affiliated to Acharya Nagarjuna University, Guntur)

Guntur District, Andhra Pradesh, India-522647

Estd:1980

CERTIFICATE

This Certificate is awarded to **GOPU VENKATESH, I B.Sc (M.P.Cs),** with Registration No. **Y213099052,** SGK Govt. Degree College, Vinukonda for completed and passed the **BASICS OF ELECTRICITY AND HOUSE WIRING** certificate course during 14.03.2022 to 23.04.2022 Conducted by Department of Physics, SGK Government. Degree College, Vinukonda.

Sri. B. Nageswararao
CONVENER

Dr. K. Srinivasa Rao
PRINCIPAL

SGK GOVERNMENT DEGREE COLLEGE VINUKONDA

(Affiliated to Acharya Nagarjuna University, Guntur)

Guntur District, Andhra Pradesh, India-522647

Estd:1980

CERTIFICATE

This Certificate is awarded to **DASARI RATNA KUMARI, I B.Sc (M.P.Cs),** with Registration No. **Y213099051,** SGK Govt. Degree College, Vinukonda for completed and passed the **BASICS OF ELECTRICITY AND HOUSE WIRING** certificate course during 14.03.2022 to 23.04.2022 Conducted by Department of Physics, SGK Government. Degree College, Vinukonda.

Sri. B. Nageswararao
CONVENER

Dr. K. Srinivasa Rao
PRINCIPAL

SGK GOVERNMENT DEGREE COLLEGE VINUKONDA

(Affiliated to Acharya Nagarjuna University, Guntur)

Guntur District, Andhra Pradesh, India-522647

Estd:1980

CERTIFICATE

This Certificate is awarded to **CHANGALA SAI VENKATA GANESH, I B.Sc (M.P.Cs),** with Registration No. **Y213099050,** SGK Govt. Degree College, Vinukonda for completed and passed the **BASICS OF ELECTRICITY AND HOUSE WIRING** certificate course during 14.03.2022 to 23.04.2022 Conducted by Department of Physics, SGK Government. Degree College, Vinukonda.

Sri. B. Nageswararao
CONVENER

Dr. K. Srinivasa Rao
PRINCIPAL

SGK GOVERNMENT DEGREE COLLEGE VINUKONDA

(Affiliated to Acharya Nagarjuna University, Guntur)

Guntur District, Andhra Pradesh, India-522647

Estd:1980

CERTIFICATE

This Certificate is awarded to **BANKA GURAVAMMA, I B.Sc (M.P.Cs),** with Registration No. **Y213099049,** SGK Govt. Degree College, Vinukonda for completed and passed the **BASICS OF ELECTRICITY AND HOUSE WIRING** certificate course during 14.03.2022 to 23.04.2022 Conducted by Department of Physics, SGK Government. Degree College, Vinukonda.

Sri. B. Nageswararao
CONVENER

Dr. K. Srinivasa Rao
PRINCIPAL

SGK GOVERNMENT DEGREE COLLEGE VINUKONDA

(Affiliated to Acharya Nagarjuna University, Guntur)

Guntur District, Andhra Pradesh, India-522647

Estd:1980

CERTIFICATE

This Certificate is awarded to **BAILADUGU TARAKA ARJUN, I B.Sc (M.P.Cs),** with Registration No. **Y213099048,** SGK Govt. Degree College, Vinukonda for completed and passed the **BASICS OF ELECTRICITY AND HOUSE WIRING** certificate course during 14.03.2022 to 23.04.2022 Conducted by Department of Physics, SGK Government. Degree College, Vinukonda.

Sri. B. Nageswararao
CONVENER

Dr. K. Srinivasa Rao
PRINCIPAL

SGK GOVERNMENT DEGREE COLLEGE VINUKONDA

(Affiliated to Acharya Nagarjuna University, Guntur)

Guntur District, Andhra Pradesh, India-522647

Estd:1980

CERTIFICATE

This Certificate is awarded to **VEERISETTY PRASANNA VANI, I B.Sc (M.P.C),** with Registration No. **Y213099047,** SGK Govt. Degree College, Vinukonda for completed and passed the **BASICS OF ELECTRICITY AND HOUSE WIRING** certificate course during 14.03.2022 to 23.04.2022 Conducted by Department of Physics, SGK Government. Degree College, Vinukonda.

Sri. B. Nageswararao
CONVENER

Dr. K. Srinivasa Rao
PRINCIPAL

SGK GOVERNMENT DEGREE COLLEGE VINUKONDA

(Affiliated to Acharya Nagarjuna University, Guntur)

Guntur District, Andhra Pradesh, India-522647

Estd:1980

CERTIFICATE

This Certificate is awarded to **PEDDEETI JOHN CHAITANYA KUMAR, I B.Sc (M.P.C),** with Registration No. **Y213099044,** SGK Govt. Degree College, Vinukonda for completed and passed the **BASICS OF ELECTRICITY AND HOUSE WIRING** certificate course during 14.03.2022 to 23.04.2022 Conducted by Department of Physics, SGK Government. Degree College, Vinukonda.

Sri. B. Nageswararao
CONVENER

Dr. K. Srinivasa Rao
PRINCIPAL

SGK GOVERNMENT DEGREE COLLEGE VINUKONDA

(Affiliated to Acharya Nagarjuna University, Guntur)

Guntur District, Andhra Pradesh, India-522647

Estd:1980

CERTIFICATE

This Certificate is awarded to **MERAJOTHU BUJJI BABU NAIK, I B.Sc (M.P.C)**, with Registration No. **Y213099042**, SGK Govt. Degree College, Vinukonda for completed and passed the **BASICS OF ELECTRICITY AND HOUSE WIRING** certificate course during 14.03.2022 to 23.04.2022 Conducted by Department of Physics, SGK Government. Degree College, Vinukonda.

Sri. B. Nageswararao
CONVENER

Dr. K. Srinivasa Rao
PRINCIPAL

SGK GOVERNMENT DEGREE COLLEGE VINUKONDA

(Affiliated to Acharya Nagarjuna University, Guntur)

Guntur District, Andhra Pradesh, India-522647

Estd:1980

CERTIFICATE

This Certificate is awarded to **KANDETI NAGA LAKSHMI,** I B.Sc (M.P.C), with Registration No. **Y213099041,** SGK Govt. Degree College, Vinukonda for completed and passed the **BASICS OF ELECTRICITY AND HOUSE WIRING** certificate course during 14.03.2022 to 23.04.2022 Conducted by Department of Physics, SGK Government. Degree College, Vinukonda.

Sri. B. Nageswararao
CONVENER

Dr. K. Srinivasa Rao
PRINCIPAL

SGK GOVERNMENT DEGREE COLLEGE VINUKONDA

(Affiliated to Acharya Nagarjuna University, Guntur)

Guntur District, Andhra Pradesh, India-522647

Estd:1980

CERTIFICATE

This Certificate is awarded to **GURRALA MANJULA RANI, I B.Sc (M.P.C),** with Registration No. **Y213099040,** SGK Govt. Degree College, Vinukonda for completed and passed the **BASICS OF ELECTRICITY AND HOUSE WIRING** certificate course during 14.03.2022 to 23.04.2022 Conducted by Department of Physics, SGK Government. Degree College, Vinukonda.

Sri. B. Nageswararao
CONVENER

Dr. K. Srinivasa Rao
PRINCIPAL

SGK GOVERNMENT DEGREE COLLEGE VINUKONDA

(Affiliated to Acharya Nagarjuna University, Guntur)

Guntur District, Andhra Pradesh, India-522647

Estd:1980

CERTIFICATE

This Certificate is awarded to **CHIRAMPALLI TULASI, I B.Sc (M.P.C),** with Registration No. **Y213099039,** SGK Govt. Degree College, Vinukonda for completed and passed the **BASICS OF ELECTRICITY AND HOUSE WIRING** certificate course during 14.03.2022 to 23.04.2022 Conducted by Department of Physics, SGK Government. Degree College, Vinukonda.

Sri. B. Nageswararao
CONVENER

Dr. K. Srinivasa Rao
PRINCIPAL

SGK GOVERNMENT DEGREE COLLEGE VINUKONDA

(Affiliated to Acharya Nagarjuna University, Guntur)

Guntur District, Andhra Pradesh, India-522647

Estd:1980

CERTIFICATE

This Certificate is awarded to **CHANDA VENKATA RAMADEVI, I B.Sc (M.P.C),** with Registration No. **Y213099038,** SGK Govt. Degree College, Vinukonda for completed and passed the **BASICS OF ELECTRICITY AND HOUSE WIRING** certificate course during 14.03.2022 to 23.04.2022 Conducted by Department of Physics, SGK Government. Degree College, Vinukonda.

Sri. B. Nageswararao
CONVENER

Dr. K. Srinivasa Rao
PRINCIPAL

SGK GOVERNMENT DEGREE COLLEGE VINUKONDA

(Affiliated to Acharya Nagarjuna University, Guntur)

Guntur District, Andhra Pradesh, India-522647

Estd:1980

CERTIFICATE

This Certificate is awarded to **ANNANGI SANJEEV RAJU, I B.Sc (M.P.C)**, with Registration No. **Y213099037**, SGK Govt. Degree College, Vinukonda for completed and passed the **BASICS OF ELECTRICITY AND HOUSE WIRING** certificate course during 14.03.2022 to 23.04.2022 Conducted by Department of Physics, SGK Government. Degree College, Vinukonda.

Sri. B. Nageswararao
CONVENER

Dr. K. Srinivasa Rao
PRINCIPAL

SGK GOVERNMENT DEGREE COLLEGE VINUKONDA

(Affiliated to Acharya Nagarjuna University, Guntur)

Guntur District, Andhra Pradesh, India-522647

Estd:1980

CERTIFICATE

This Certificate is awarded to **YADLAPALLI VASU, I B.Sc (M.P.Cs)**, with Registration No. **Y213099073**, SGK Govt. Degree College, Vinukonda for completed and passed the **BASICS OF ELECTRICITY AND HOUSE WIRING** certificate course during 14.03.2022 to 23.04.2022 Conducted by Department of Physics, SGK Government. Degree College, Vinukonda.

Sri. B. Nageswararao
CONVENER

Dr. K. Srinivasa Rao
PRINCIPAL