Estd:2008

METHODIST

COLLEGE OF ENGINEERING AND TECHNOLOGY

(Affiliated to Osmania University & Approved by AICTE, New Delhi)

LABORATORY MANUAL

COMPUTER AIDED ELECTRICAL DRAWINGBE,

III Semester (CBCS): 2020-21

NAME: _____

ROLL NO:_____

BRANCH:_____

SEM:_____

DEPARTMENT OF ELECTRICAL AND ELECTRONCS ENGINEERING

Empower youth- Architects of Future World

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COLLEGE OF ENGINEERING AND TECHNOLOGY

VISION

To produce ethical, socially conscious and innovative professionals who would contribute to sustainable technological development of the society.

MISSION

To impart quality engineering education with latest technological developments and interdisciplinary skills to make students succeed in professional practice.

To encourage research culture among faculty and students by establishing state of art laboratories and exposing them to modern industrial and organizational practices.

To inculcate humane qualities like environmental consciousness, leadership, social values, professional ethics and engage in independent and lifelong learning for sustainable contribution to the society.

DEPARTMENT
OF
ELECTRICAL AND ELECTRONICS ENGINEERING

LABORATORY MANUAL

COMPUTER AIDED ELECTRICAL DRAWING LABORATORY

Prepared
By
Mr.N.NIREEKSHAN

Assistant Professor

Estd:2008

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COLLEGE OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

VISION

To become a reputed centre for imparting quality education in Electrical and Electronics Engineering with human values, ethics and social responsibility.

MISSION

- To impart fundamental knowledge of Electrical, Electronics and Computational Technology.
- To develop professional skills through hands-on experience aligned to industry needs.
- To undertake research in sunrise areas of Electrical and Electronics Engineering.
- To motivate and facilitate individual and team activities to enhance personality skills.

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

PROGRAM EDUCATIONAL OBJECTIVES

BE-Electrical Engineering graduates shall be able to:

- **PEO1**. Utilize domain knowledge required for analyzing and resolving practical Electrical Engineering problems.
- **PEO2**.Willing to undertake inter-disciplinary projects, demonstrate the professional skills and flair for investigation.
- **PEO3**. Imbibe the state of the art technologies in the ever transforming technical scenario.
- **PEO4**. Exhibit social and professional ethics for sustainable development of the society.

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PROGRAM OUTCOMES

Engineering Graduates will have ability to:

- **PO1. Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of electrical and electronics engineering problems.
- **PO2. Problem analysis:** Identify, formulate, review research literature, and analyze complex electrical and electronics engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- **PO3. Design/development of solutions:** Design solutions for complex electrical and electronics engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- **PO4. Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- **PO5. Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex electrical and electronics engineering activities with an understanding of the limitations.
- **PO6. The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional electrical and electronics engineering practice.
- **PO7. Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- **PO.8 Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the electrical and electronics engineering practice.
- **PO9. Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
- **PO10. Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
- **PO11. Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
- **PO12. Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

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PROGRAM SPECIFIC OUTCOMES

At the end of BE program Electrical and Electronics Engineering graduates will be able to:

- **PSO1**.Provide effective solutions in the fields of Power Electronics, Power Systems and Electrical Machines using MATLAB/MULTISIM.
- **PSO2.** Design and Develop various Electrical and Electronics Systems, particularly Renewable Energy Systems.
- **PSO3.** Demonstrate the overall knowledge and contribute for the betterment of the society.

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

I. PREREQUISITE(S):

Level	Credits	Semester	Prerequisites
UG	1	1	COMPUTER AIDED ELECTRICAL DRAWING LAB

II. SCHEME OF INSTRUCTIONS

Lectures	Tutorials	Practicals	Credits
0	0	2	1

III. SCHEME OF EVALUATION & GRADING

S. No	Component	Duration	Maximum Marks
	Continuous Internal Evaluation (CIE)		
1.	Internal Examination – I	1 hours	25
	CIE (Total)		**25**
2.	**Semester End Examination** (University Examination)	3 hours	**50**
		TOTAL	**75**

%Marks Range	>=90	80 to <90	70 to < 80	60 to < 70	50 to <60	40 to < 50	< 40	Absent
Grade	S	A	B	C	D	E	F	Ab
Grade Point	10	9	8	7	6	5	0	-

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COURSE OUTCOMES

After completing this course the student will be able to:

SL.NO	CO	BT LEVEL
1	I**dentify** and draw different components of electrical systems	Apply
2	**Draw** different control and wiring diagrams	Create
3	**Draw** winding diagrams of electrical machines	create
4	**To understand** the terminology of electric circuit and electrical components	understand
5	**To be able** to familiarize with electrical machines, apparatus and appliances	understand
6	**To acquire** knowledge on various Electrical Engineering software	Evaluate

Mapping of Cos with POs and PSOs (Correlation Level: High – 3; Medium – 2; Low – 1)

PO / CO	PO 1	P O2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO 11	PO 12	PSO1	PSO2	PSO3
C452.1	3	3	1	-	1	-	-	-	2	-	-	-	3	-	-
C452.2	3	3	1	2	1	-	-	-	2	-	-	-	3	-	-
C452.3	3	3	3	1	3	-	-	-	3	-	-	-	3	3	-
C452.4	3	3	-	-	-	-	-	-	3	-	-	-	1	3	-
C452.5	3	-	-	-	-	3	-	3	3	-	-	3	1	3	-
C452.6	-	-	-	1	-	-	-	-	1	-	-	-	-	-	3
AVG	3	3	1.6	1.3	1.6			3	2.3			3	2.2	3	3

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Code of Conduct

1. Students should report to the concerned labs as per the time table schedule.
2. Studentswhoturnuplatetothelabswillinnocasebepermittedtoperformtheexperiment scheduled for the day.
3. Students should bring a note book of about 100 pages and should enter the readings/observations into the note book while performing the experiment.
4. After completion of the experiment, certification of the concerned staff in-charge in the observation book is necessary.
5. Staff in-charge shall award **25marks** for each experiment based on continuous evaluation and will be entered in the continuous internal evaluation sheet.
6. These 25 marks are divided as **10 marks** for **overall performance** of the student in conducting the experiment (which is further divided as 5marks for Viva voce and 5 marks execution of the experiment), **10 marks** for **observation** and **5marks** for **record**.
7. The record of observations along with the detailed experimental procedure of the experiment performed in the immediate last session should be submitted and certified by the staff member in-charge.
8. The group-wise division made in the beginning should be adhered to, and no student is allowed to mix up with different groups later.
9. The components required pertaining to the experiment should be collected from lab assistant, only after duly filling in the requisition form.
10. When the experiment is completed, students should disconnect the setup made by them, and should return all the components/instruments to lab assistant.
11. Any damage of the equipment or burn-out of components will be viewed seriously by either charging penalty or dismissing the total group of students from the lab for the semester/year.
12. Students are required to prepare thoroughly to perform the experiment before coming to Laboratory.

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Estd:2008

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Do's and Don'ts in the laboratory

Do's:

1. Remove your footwear before you enter the lab.
2. Always keep quiet. Be considerate to other lab users.
3. Report any problems with the computer to the person in charge.
4. Shut down the computer properly.

Don'ts:

1. Do not bring any food or drinks in the computer room.
2. Do not touch any part of the computer with wet hands.
3. Do not hit the keys on the computer too hard.
4. Don't damage, remove, or disconnect any labels, parts, cables or equipment.
5. Do not install or download any software or modify or delete any system files on any lab computers.
6. If you leave the lab, do not leave your personal belongings unattended.

Before Leaving Lab:

- Place the stools under the lab bench
- Turn off the power to all instruments
- Return all the equipment to lab assistant
- Turn off the main power switch to the lab bench
- Please check the laboratory notice board regularly for updates

Estd:2008

METHODIST

COLLEGE OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

CONTENTS

METHODIST

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Estd:2008

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

COMPUTER AIDED ELECTRICAL DRAWING LAB

NAME: ROLL NO:

CLASS: SECTION:

INDEX

S.No.	Name o fthe Experiment	Date of Expt. Conducted	Date of Submission	Grade/Marks	Signature	Remarks
-						

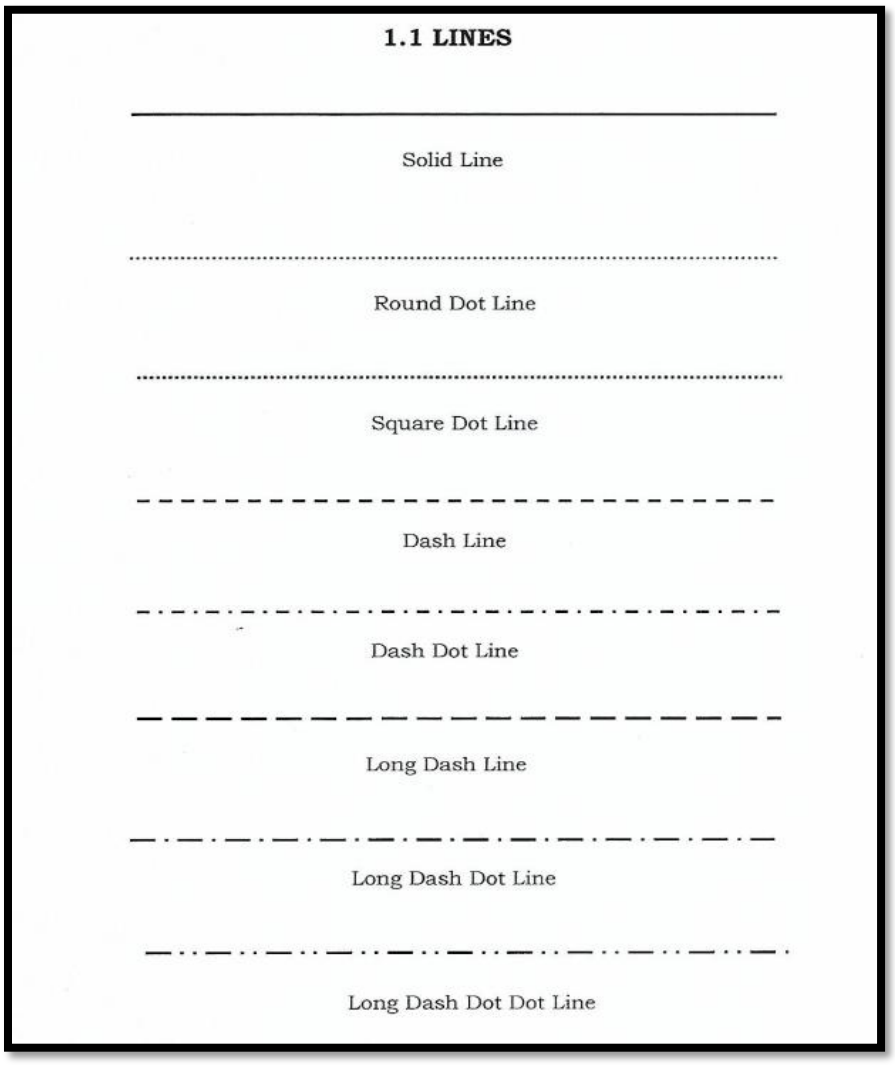
Experiment: 1 **Date:**

LINES, ARCS, CURVES, SHAPES, FILLING OF OBJECTS, OBJECT EDITING & TRANSFORMATION

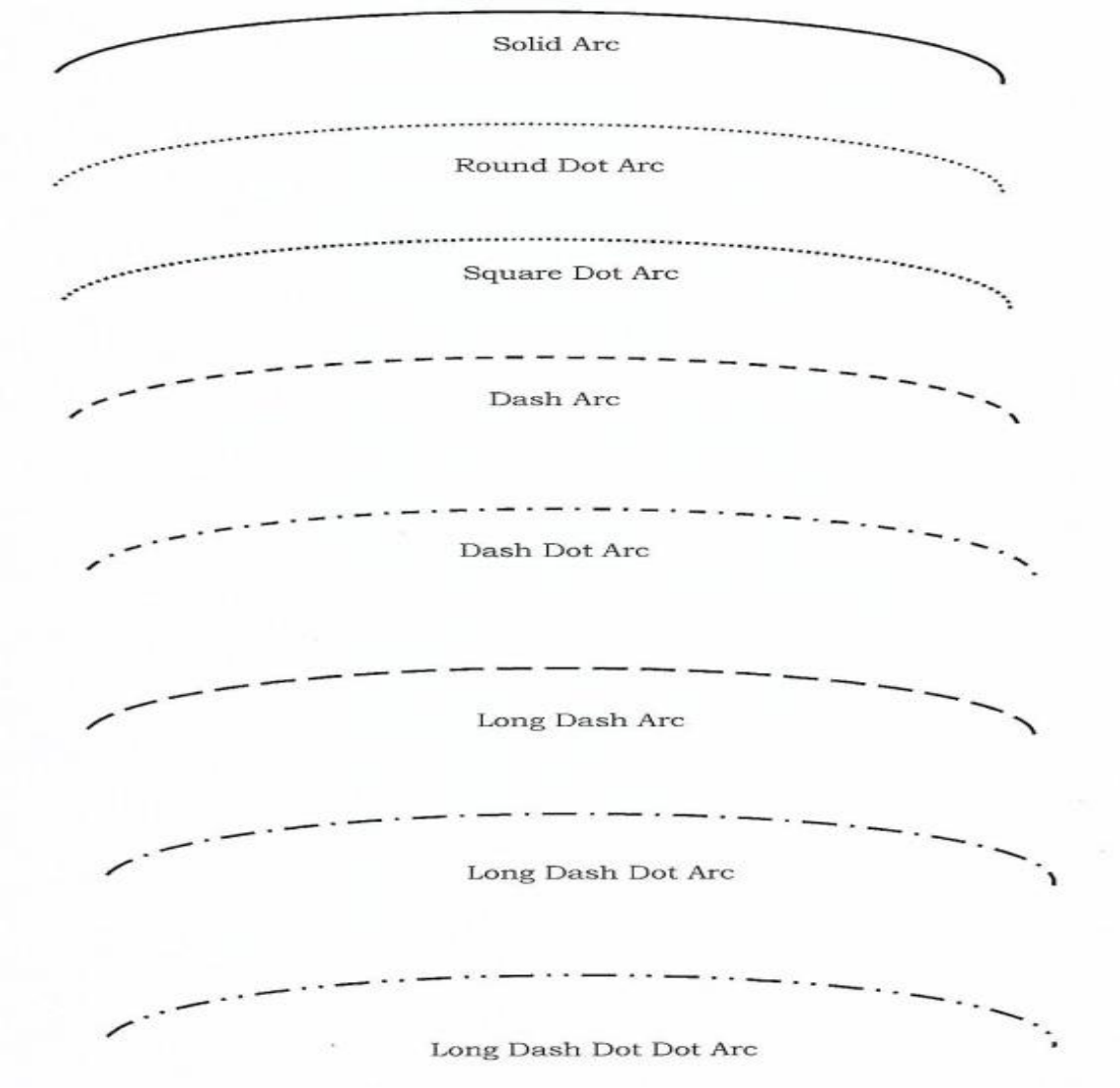
Aim: To draw the lines, arcs, curves, shapes, filling of objects, object editing and transformation.

Software required:

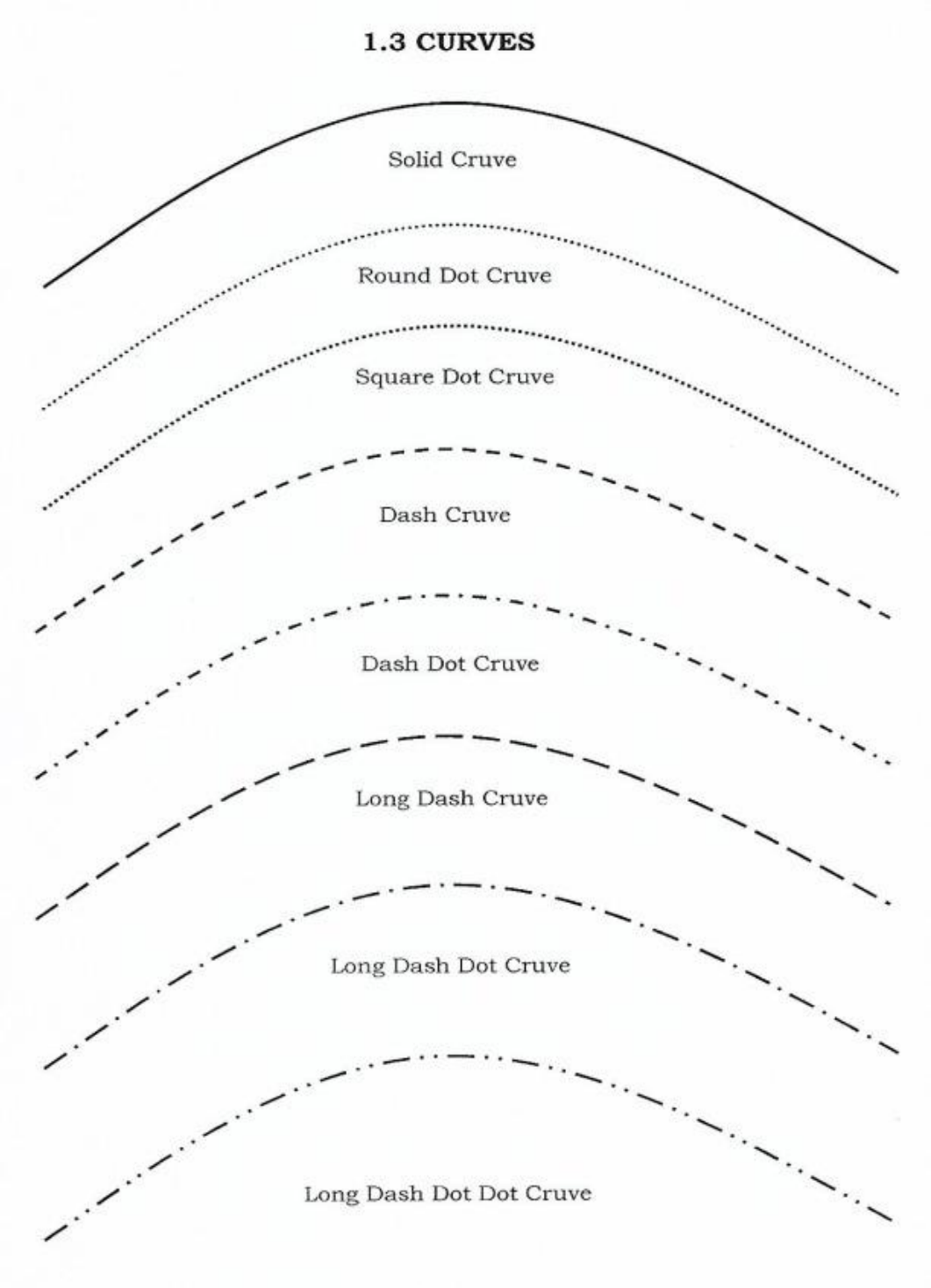
Basic Shapes

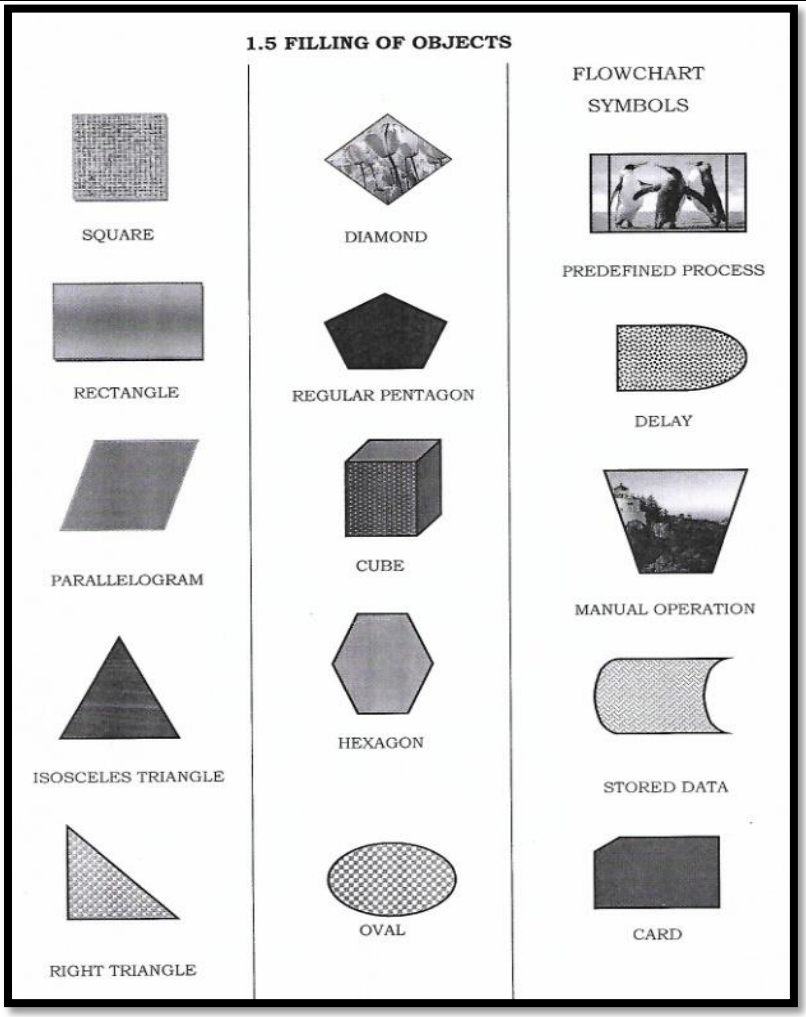


1.2 ARCS


Solid Arc
Round Dot Arc
Square Dot Arc
Dash Arc
Dash Dot Arc
Long Dash Arc
Long Dash Dot Arc
Long Dash Dot Dot Arc

1.3 CURVES


Solid Cruve
Round Dot Cruve
Square Dot Cruve
Dash Cruve
Dash Dot Cruve
Long Dash Cruve
Long Dash Dot Cruve
Long Dash Dot Dot Cruve


1.5 FILLING OF OBJECTS
FLOWCHART SYMBOLS
SQUARE
DIAMOND
PREDEFINED PROCESS
RECTANGLE
REGULAR PENTAGON
DELAY
PARALLELOGRAM
CUBE
MANUAL OPERATION
ISOSCELES TRIANGLE
HEXAGON
STORED DATA
RIGHT TRIANGLE
OVAL
CARD

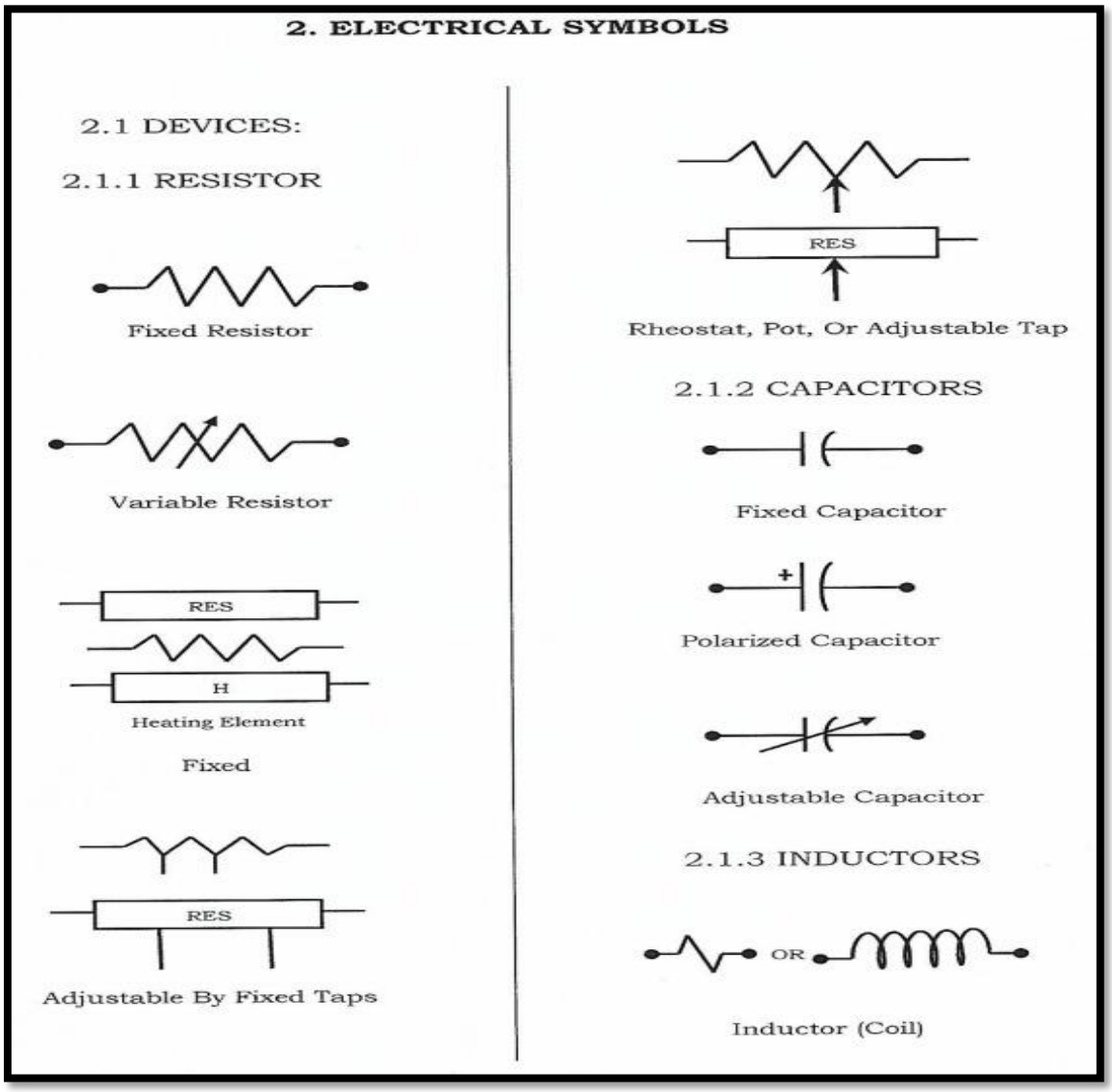
Results:

Experiment: 2 **Date:**

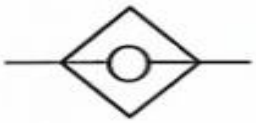
ELECTRICAL, ELECTRONIC& ELECTRO – MECHANICAL SYMBOLS

Aim: To draw and identify the electrical, electronic & electro – mechanical symbols.

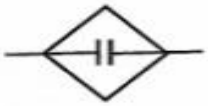
Software required:



2.1.11 SYMBOLS FOR STATIC SWITCHING CONTRL DEVICES

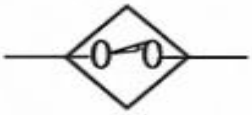


Input Coil



Output NO

Limit Switch NO



Limit Switch NC

2.1.12 SEMICONDUCTOR DEVICES

Diode

Tunnel Diode

Unidirectional Breakdown (Zener) Diode

Bidirectional Breakdown Diode

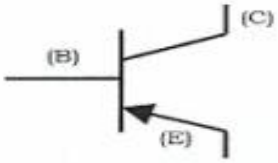
Photosensitive Cell

Triac (Bidirectional Triode Thyristor)

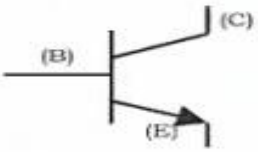
Silicon Controlled Rectifier

Programmable Unit- Junction Transistor (PUT)

2.1.13 TRANSISTOR

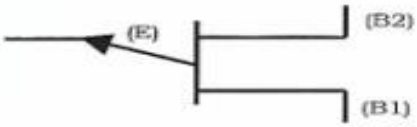


PNP Base

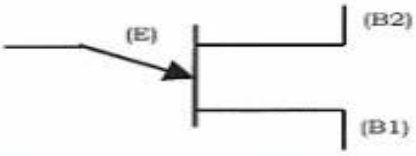


NPN Base

2.1.14 UNIJUNCTION TRANSISTOR



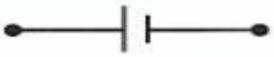
P Base



N Base

2.1.15 BATTERY

Figure 39: Battery

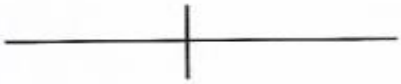


Single Cell

Multi Cell

Control

Wiring Terminal



Not Connected

Connection, Earth Ground

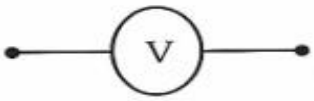
2.3.2 CONNECTIONS

Mechanical

Mechanical Interlock

2.4 METER(INSTRUMENT-INDICATE TYPE BY LETTER)

Ammeter



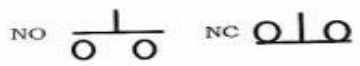
V-Voltmeter

Ohmmeter

AH-Ampere Hour

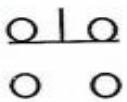
Results:

2.5.8 PUSHBUTTONS MOMENTARY CONTACT



Single Circuit

NO AND NC

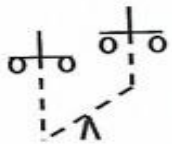


Double Circuit

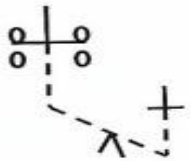
Mushroom head

Wobble Stick

2.5.9 MAINTAINED CONTACT

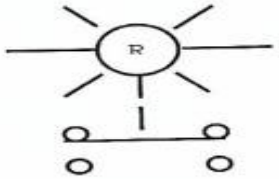


Two Single Circuit



One Double Circuit

2.5.10 ILLUMINATED

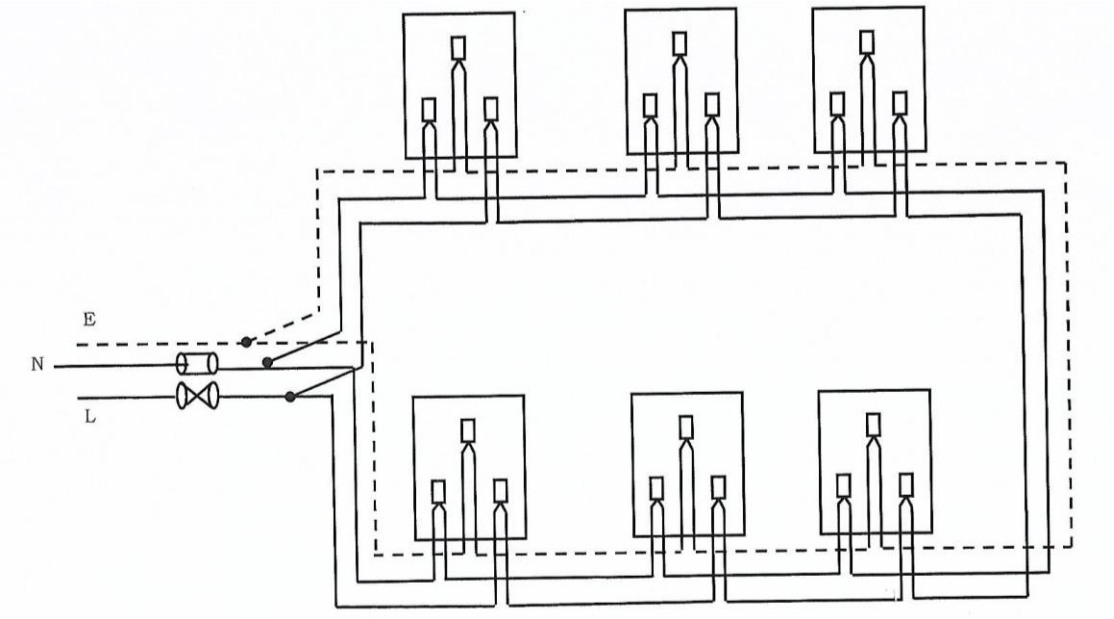


Experiment: 3 **Date:**

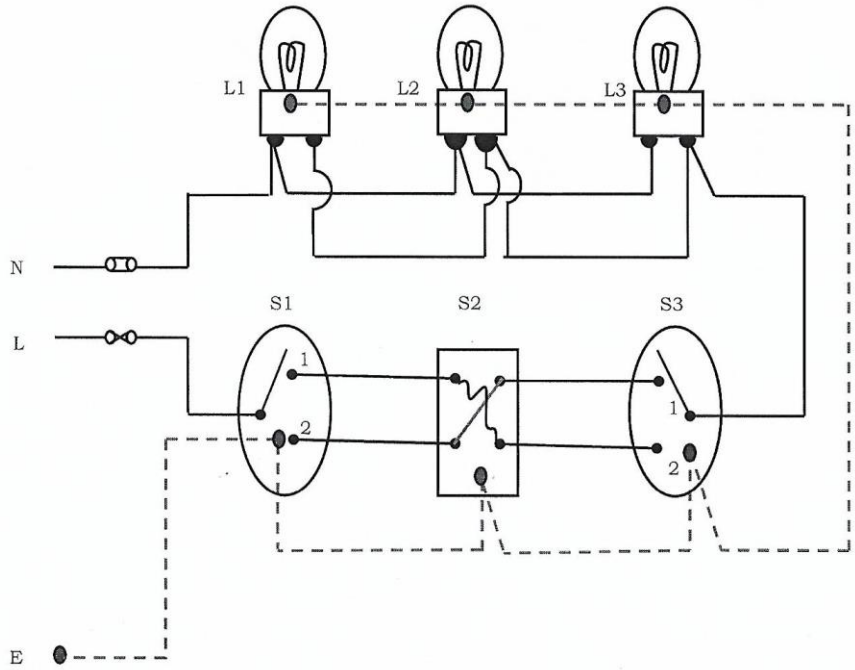
HOUSE – WIRING DIAGRAMS AND LAYOUT

Aim: To draw the house – wiring diagrams and layout.

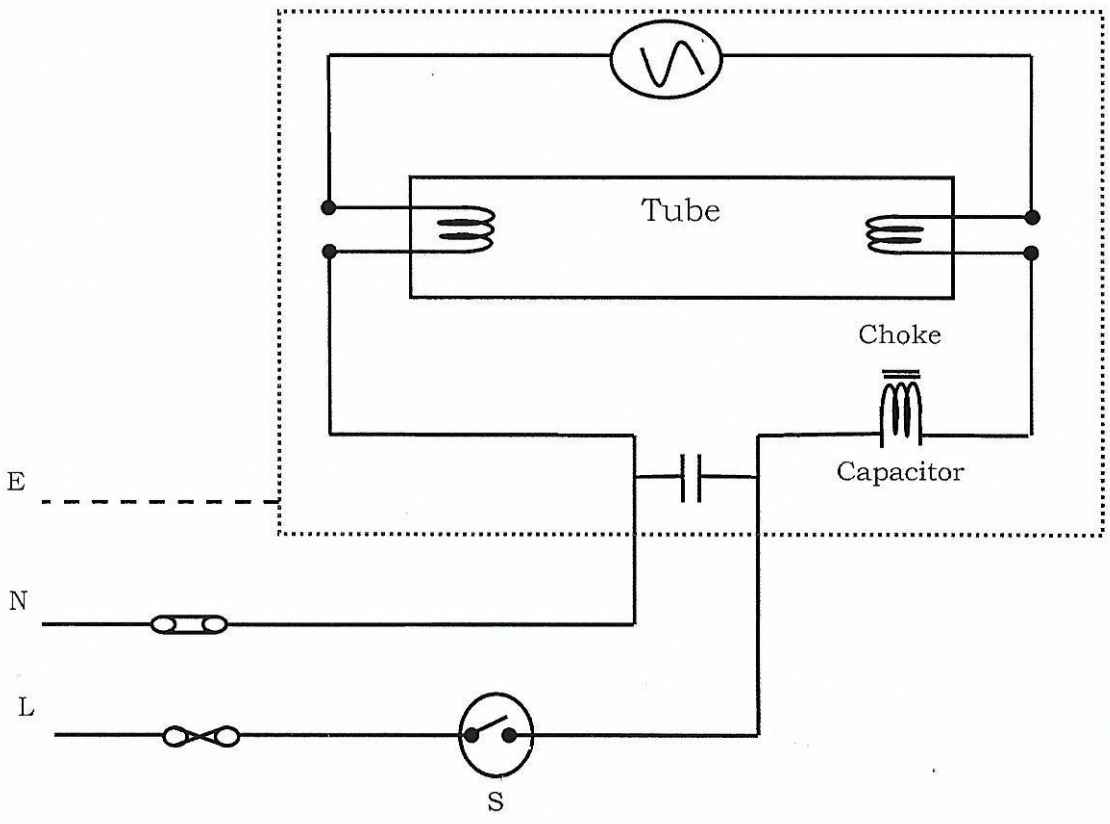
Software required:



3.1 Socket Outlets-Ring Circuit Connection



3.2 Three Light Points Controlled by Two Way Switches and Intermediate Switch



3.3Single Fluorescent Light Points Controlled by a One Way Switch

Results:

Experiment: 4 **Date:**

SIMPLE POWER AND CONTROL CIRCUIT DIAGRAMS

Aim: To draw the simple power and control circuit diagrams.

Software required:

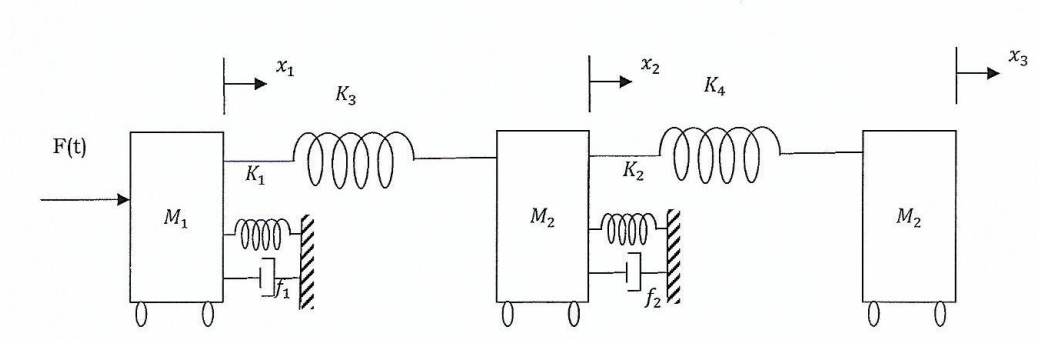


Figure 4.1 Control System Diagram

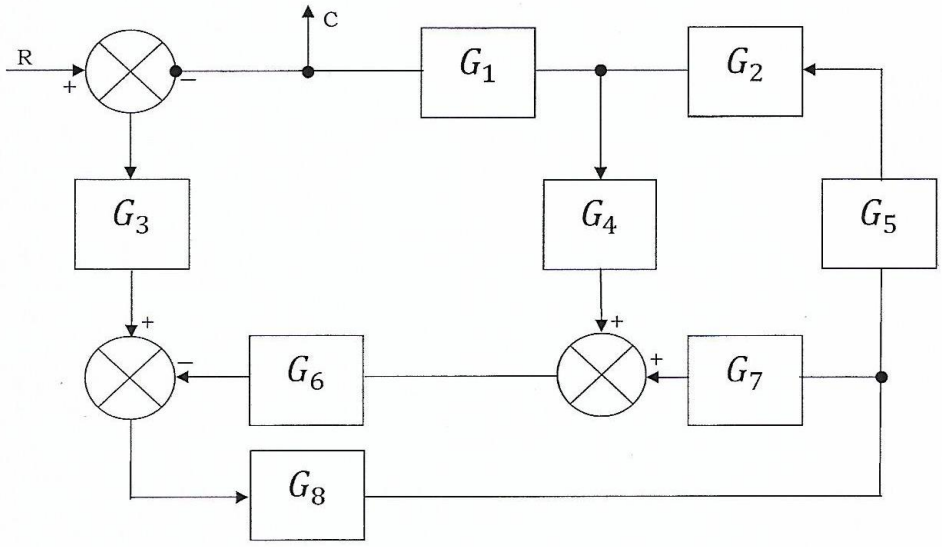


Figure 4.2 Control System Block Diagram

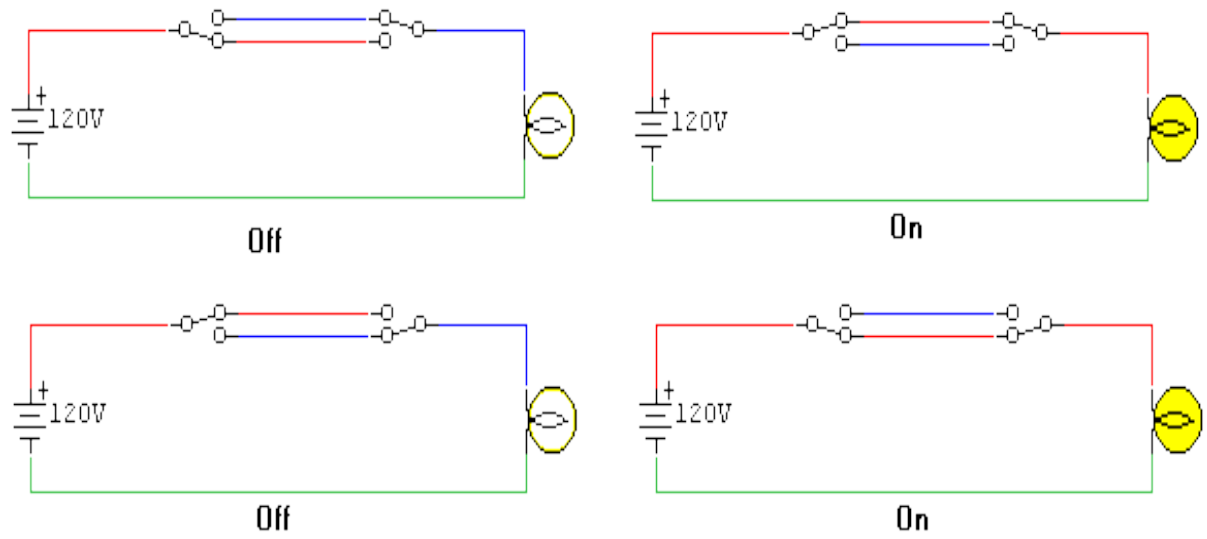


Figure 4.4Lamp Control

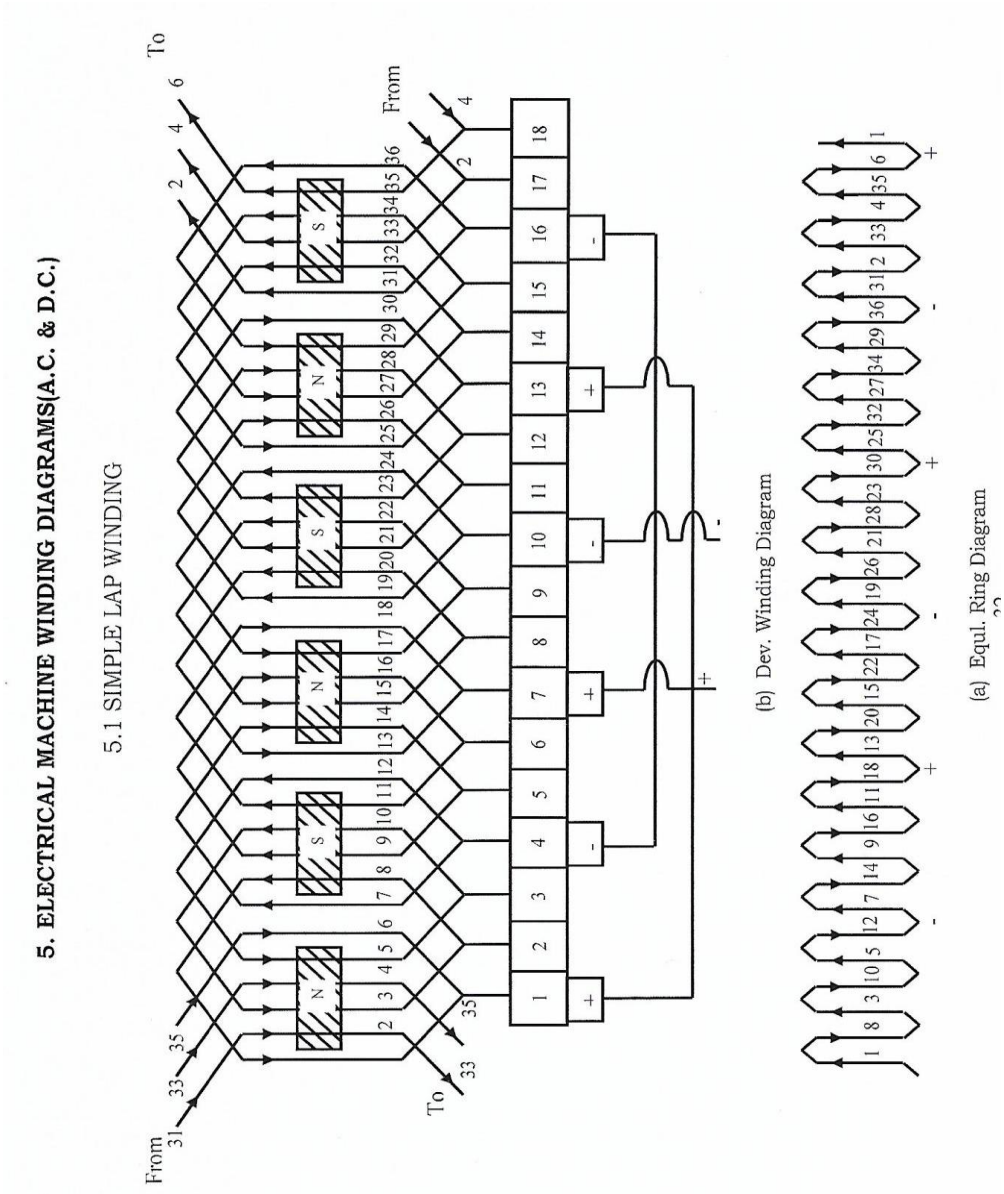
Results:

Experiment: 5 **Date:**

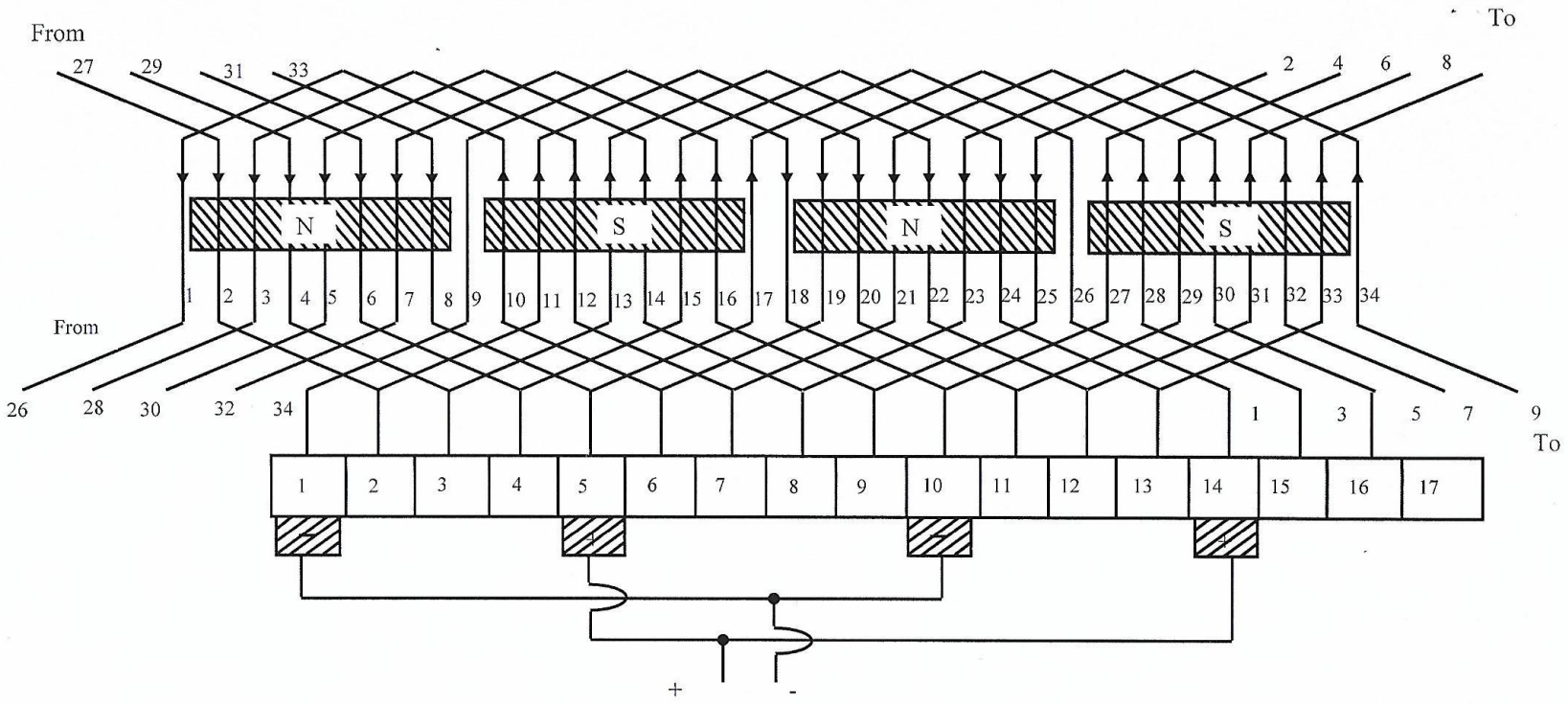
ELECTRICAL MACHINE WINDING DIAGRAMS (A.C & D.C)

Aim: To draw the electrical machine winding diagrams (A.C & D.C).

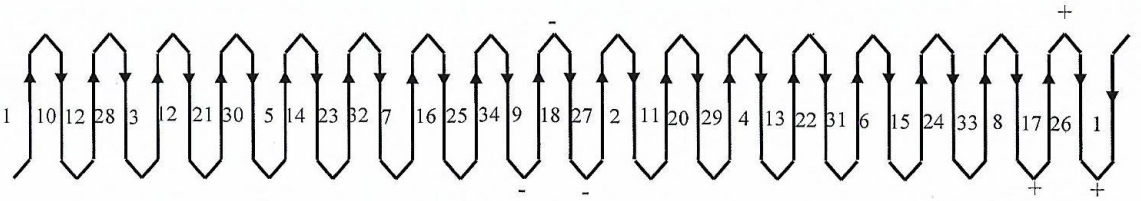
Software required:



5.2 SIMPLE WAVE WINDING

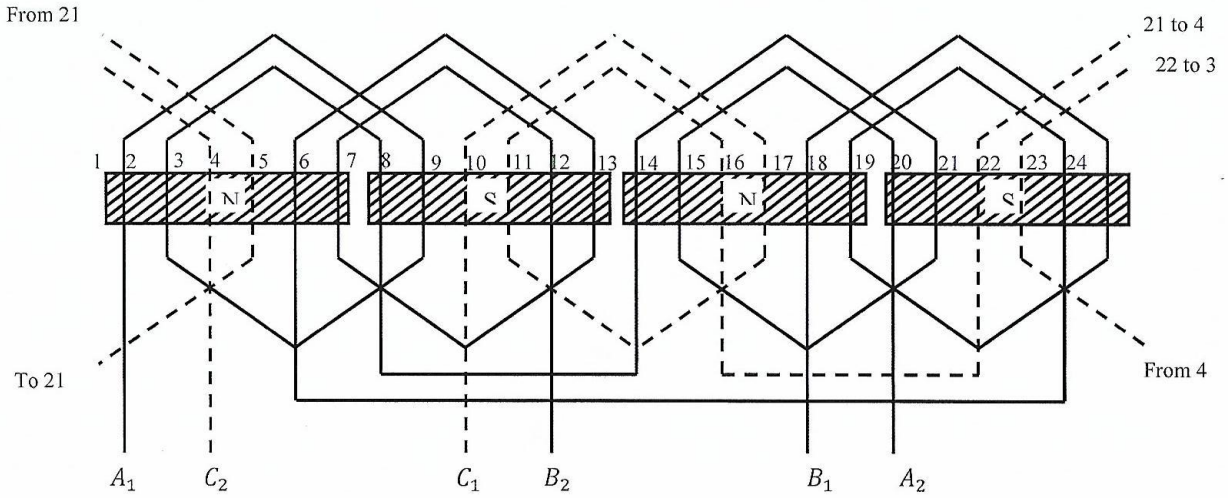


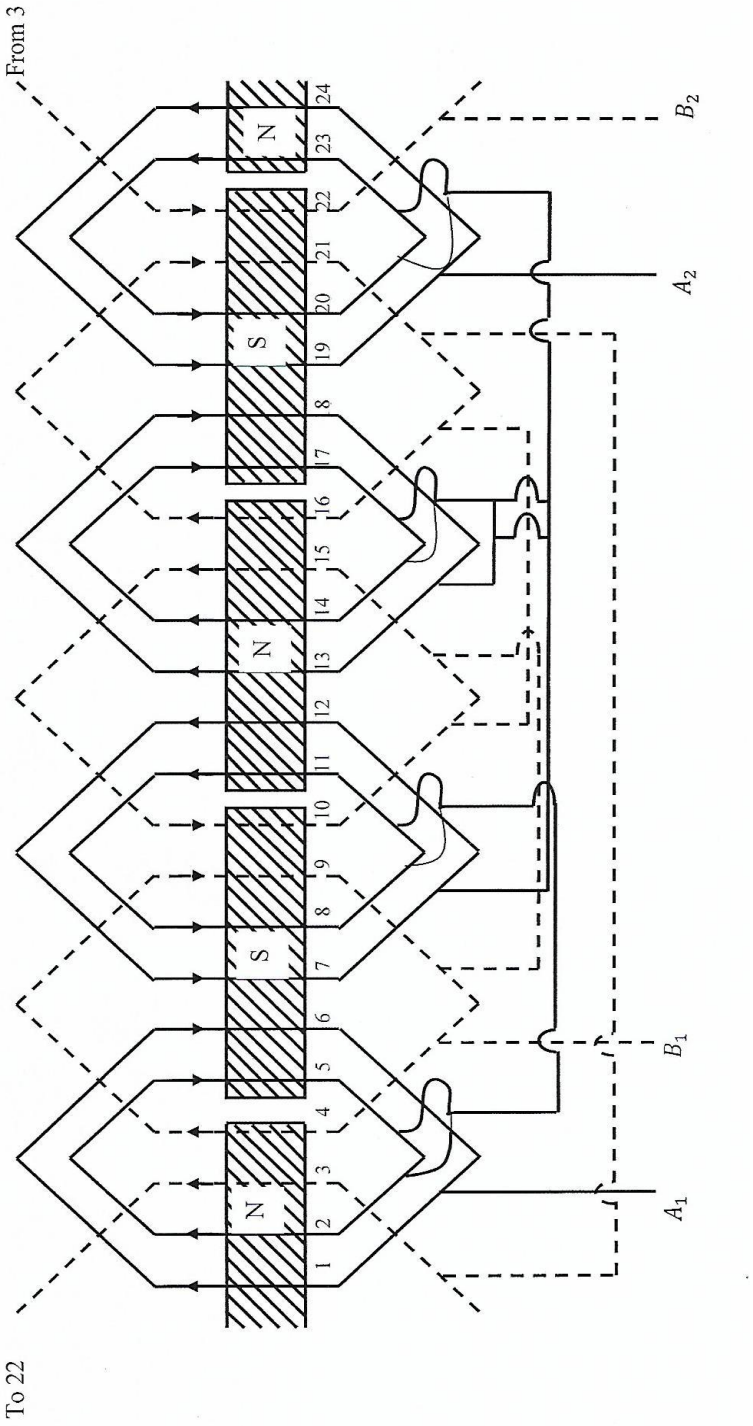
(a) Dev. Winding Diagram



(b) Equl. Ring Diagram

5.3 AND 5.4 DEVELOPED WINDING DIAGRAMS FOR 3 PHASE STATOR 24 SLOTS, 4 POLES (CONCENTRIC WINDING)




From 3
To 22
N
S
N
S
N
S
N
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
8
19
20
21
22
23
24
A_1
B_1
A_2
B_2

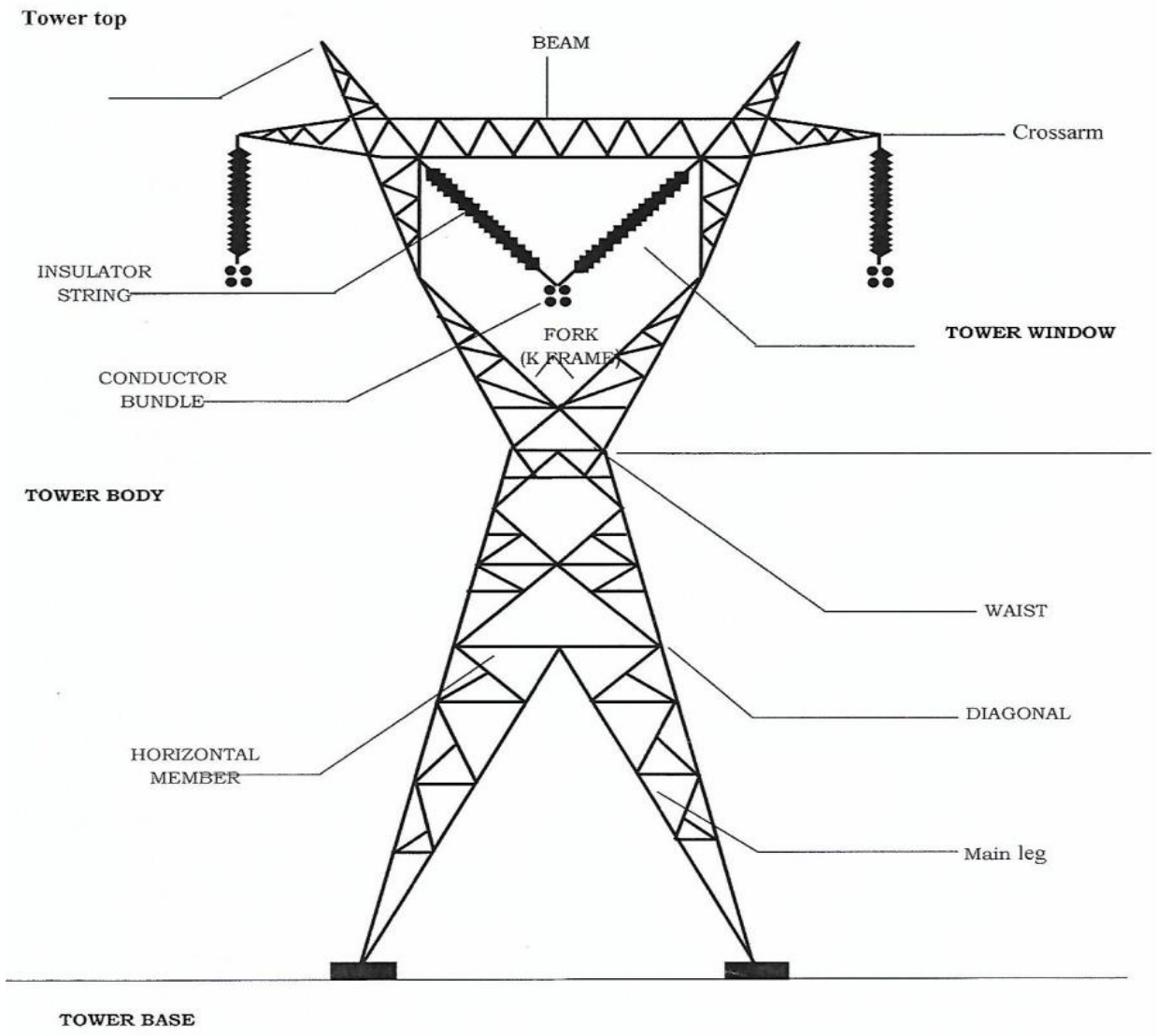
Results:

Experiment: 6 **Date:**

TRANSMISSION TOWER, OVER HEAD LINES – ACSR CONDUCTORS, SINGLE CIRCUIT, DOUBLE CIRCUIT, BUNDLE CONDUCTOR

Aim: To draw the Transmission tower, Over head lines – ACSR conductors, single circuit, double circuit, and Bundle conductor.

Software required:



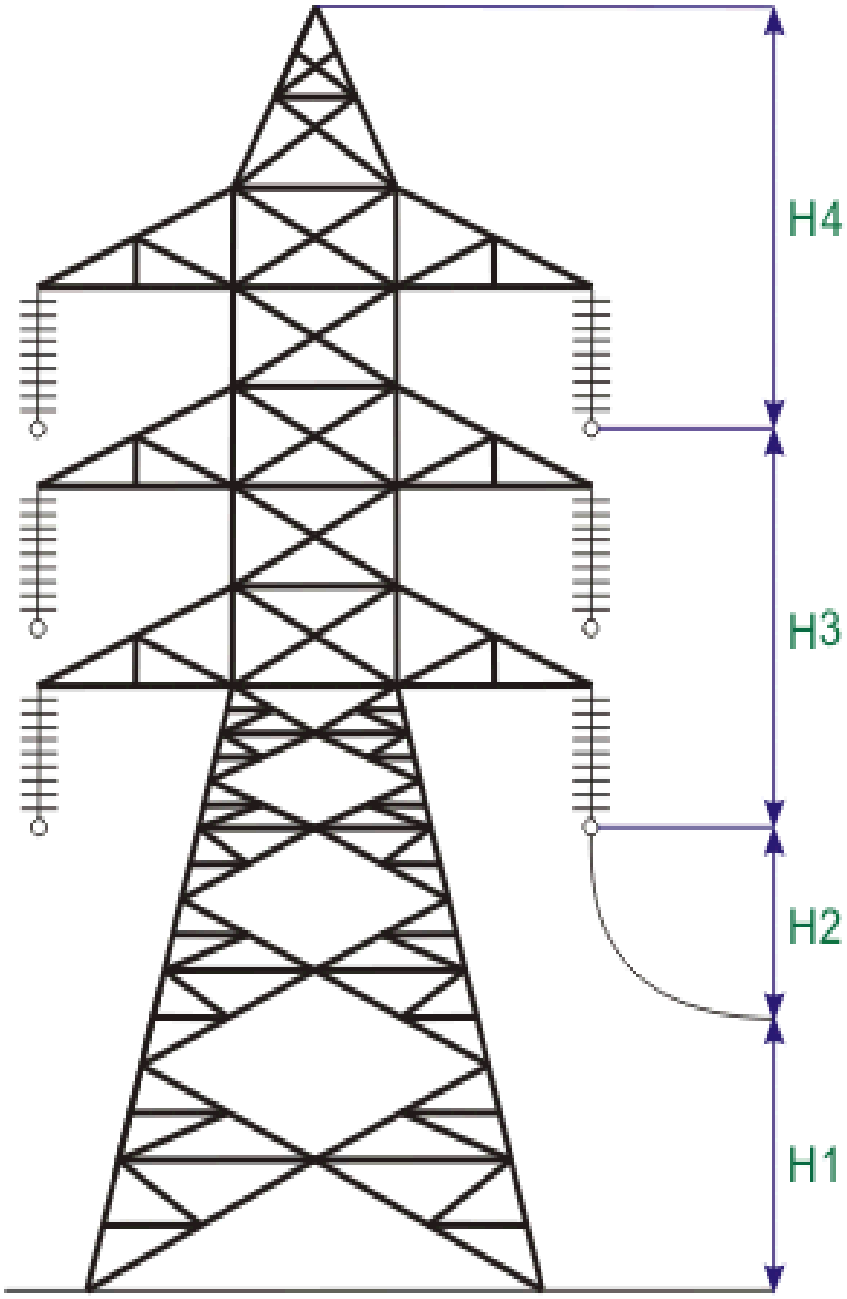


Figure 6.1 Transmission Tower

Results:

Experiment: 7 **Date:**

CONSTRUCTIONAL FEATURES OF D.C MOTORS, AC MOTORS AND TRANSFORMERS

Aim: To draw the constructional features of D.C motors, AC motors and Transformers.

Software required:

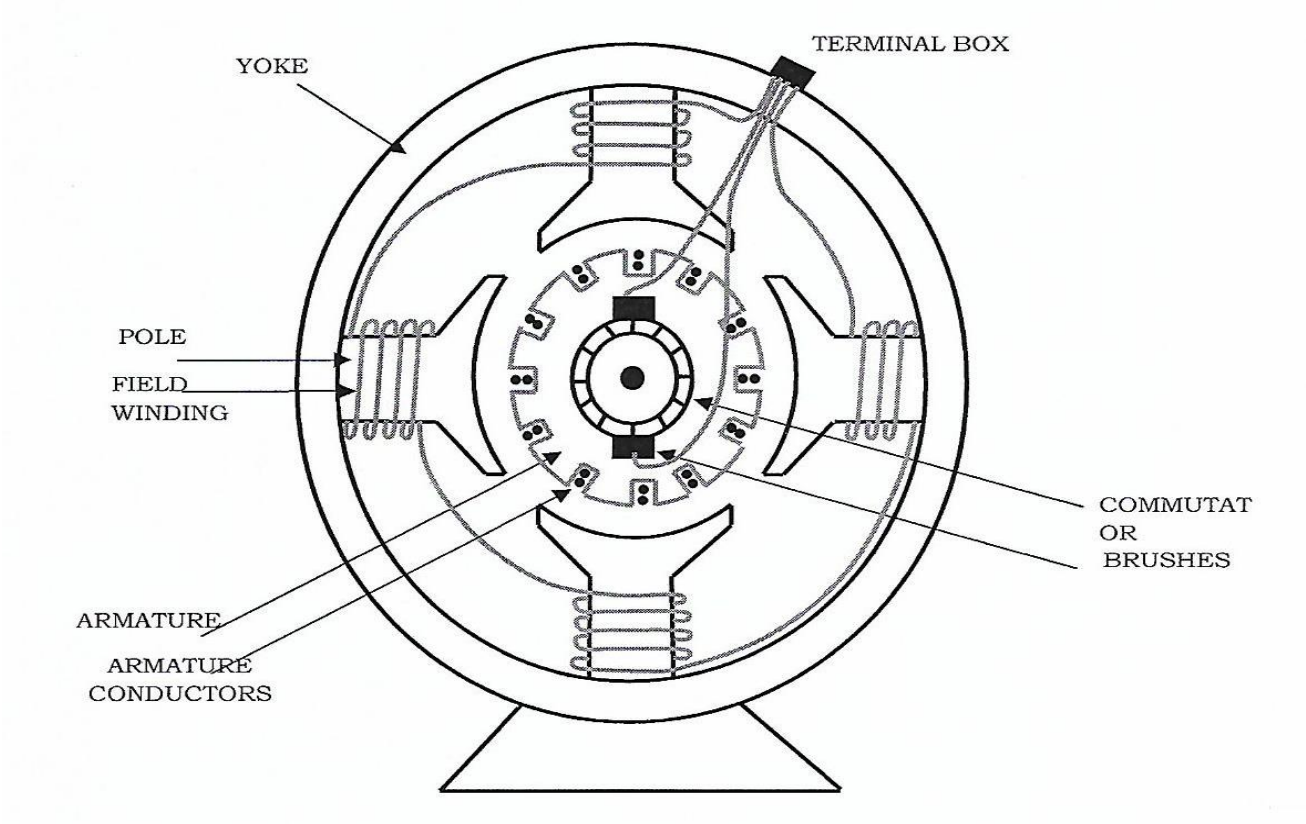


Figure 7.1 D.C. Motor

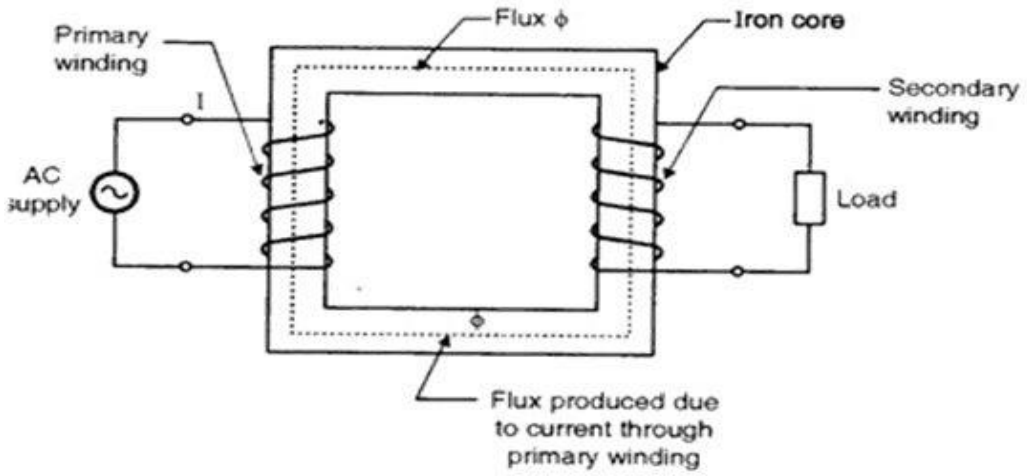


Figure 7.2 Transformer

Results:

Experiment: 8 **Date:**

D.C AND A.C MOTOR STARTER DIAGRAMS

Aim: To draw the D.C and A.C motor starter diagrams.

Software required:

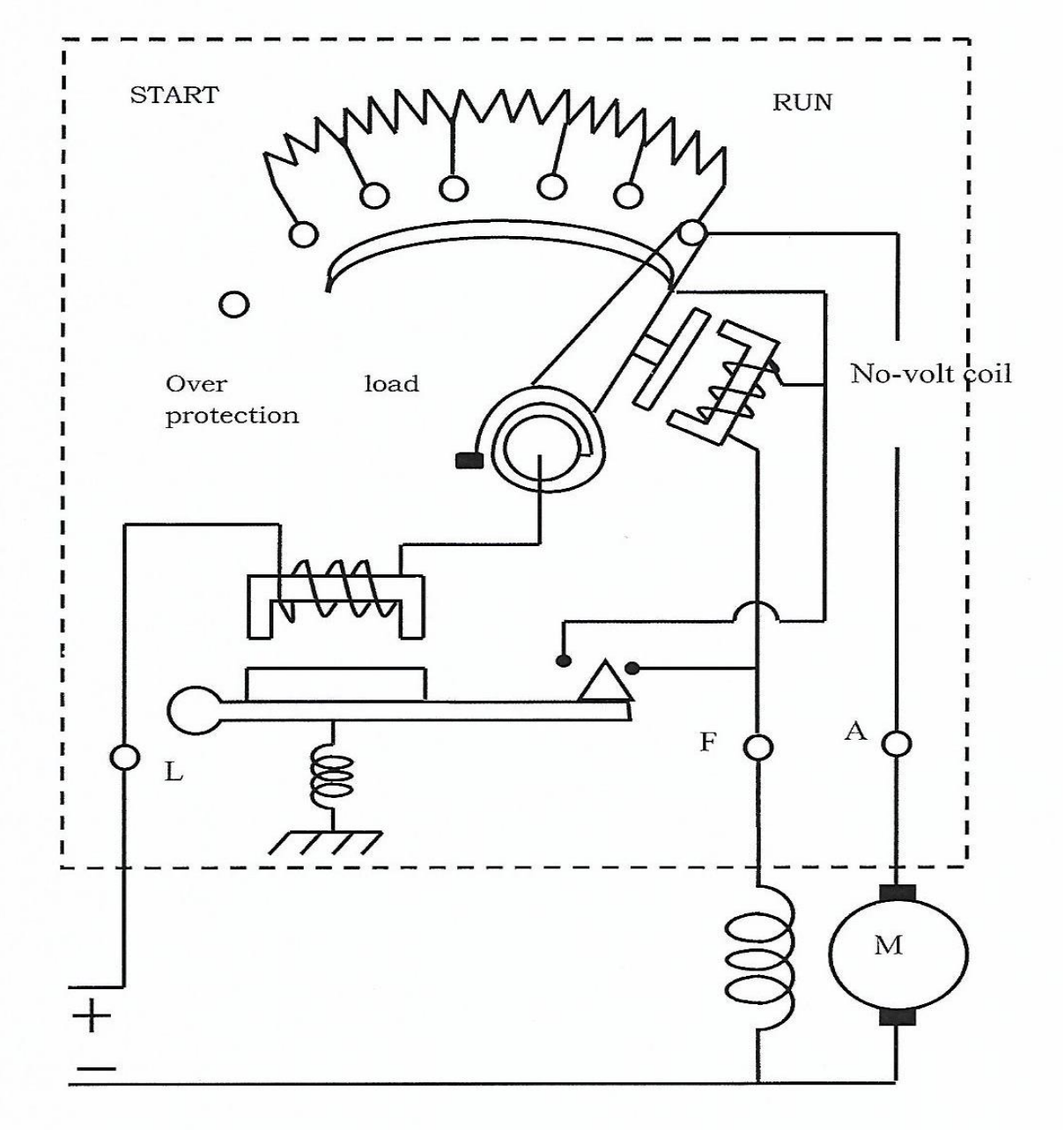


Figure 8.1 Three point Starter for a DC Shunt Motor

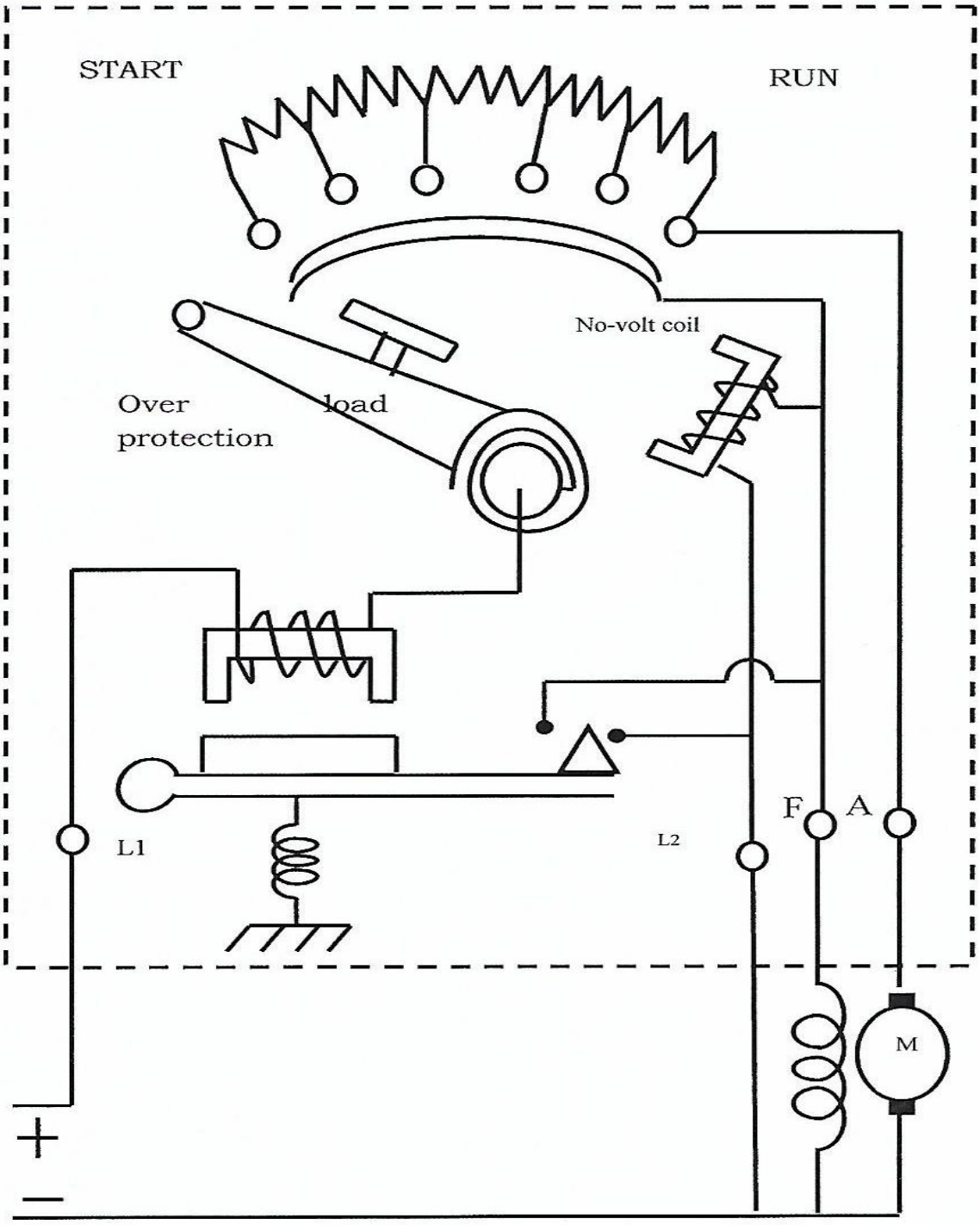


Figure 8.2 Three point Starter for a DC Compound Motor

Results:

Experiment: 9 **Date:**

LAMPS USED IN ILLUMINATION

Aim: To draw the lamps used in illumination.

Software required:

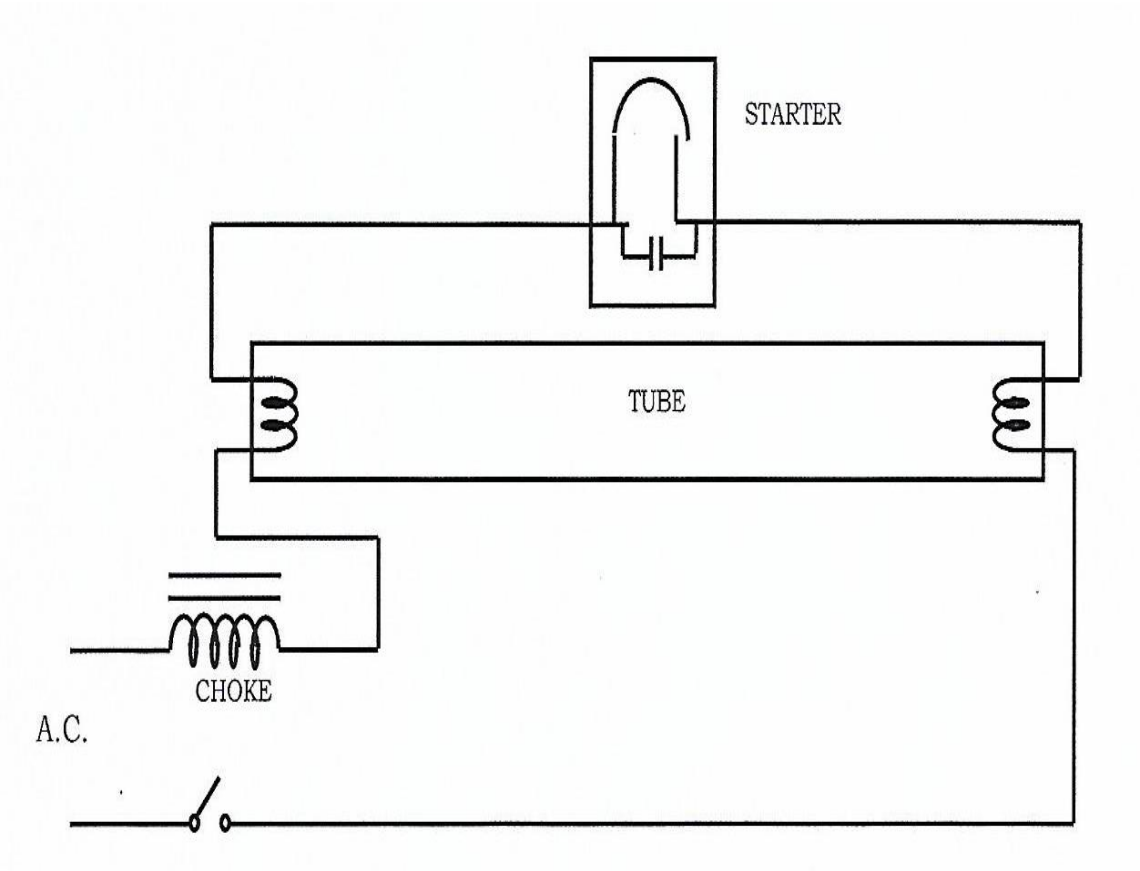


FIGURE 9.1 FLUORESCENT LAMP A.C.

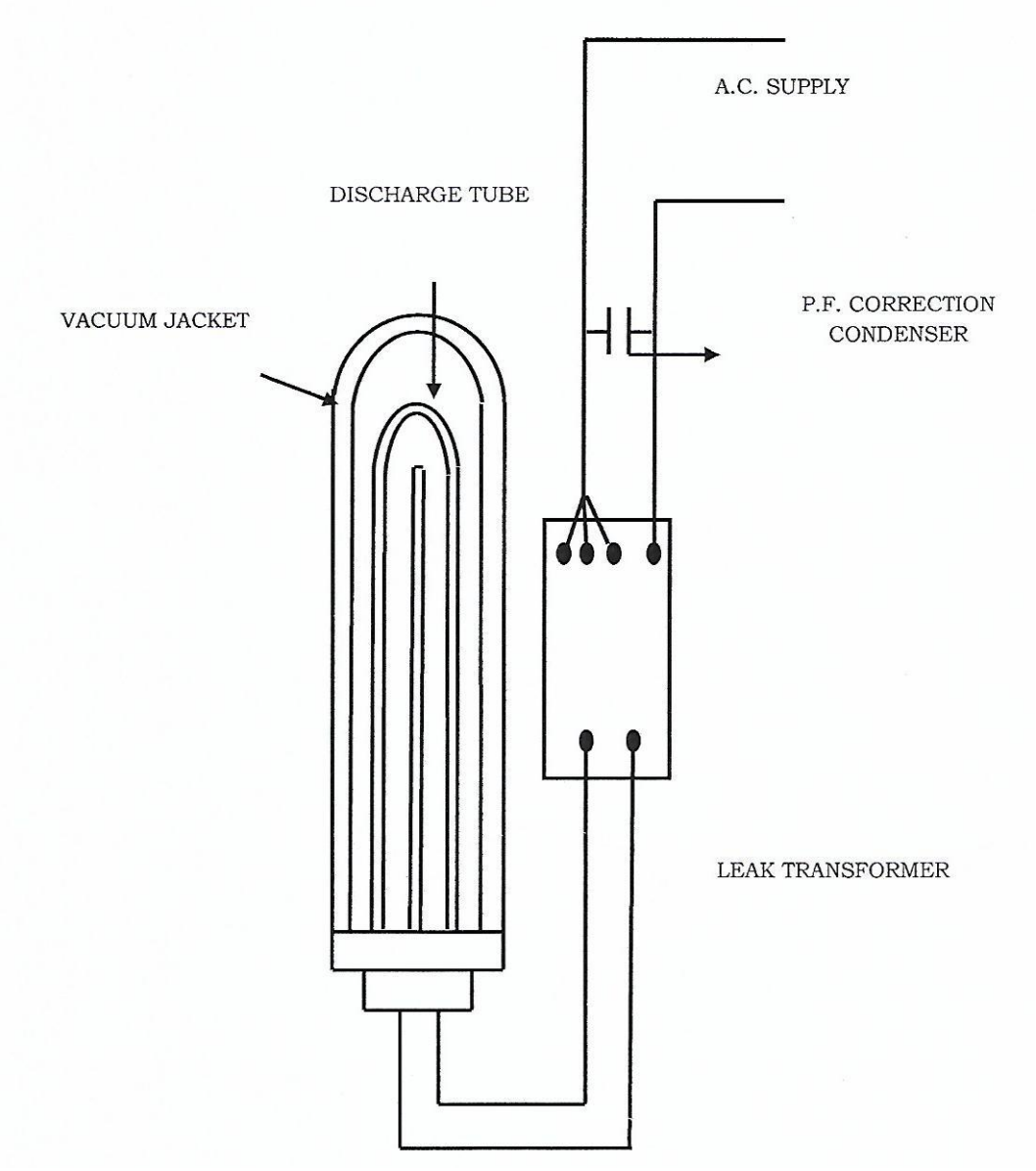


FIGURE 9.3 SODIUM VAPOUR LAMP

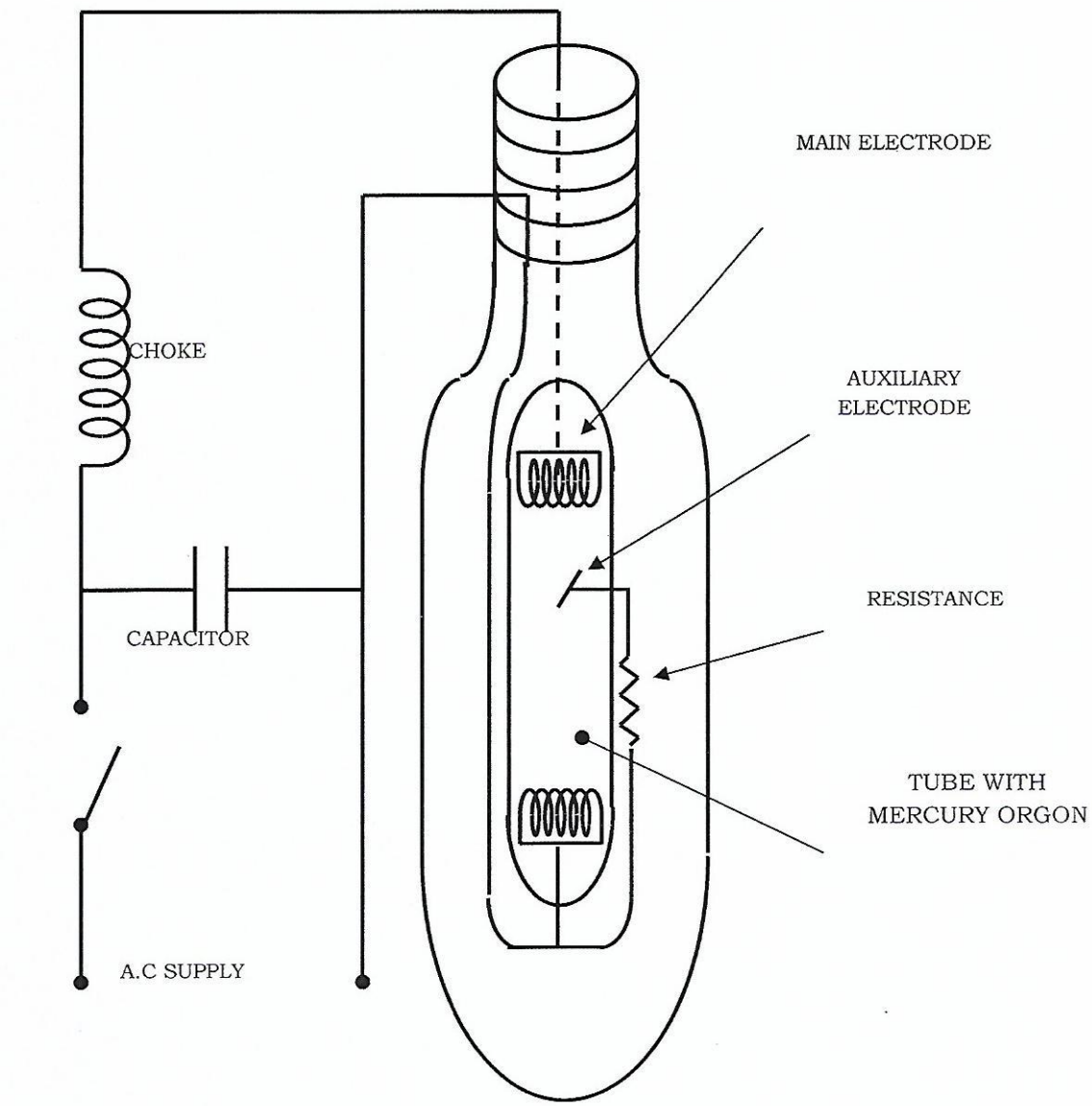


FIGURE 9.4 MERCURY VAPOUR LAMP

Results:

Experiment: 10 **Date:**

SINGLE LINE DIAGRAM OF POWER SYSTEM

Aim: To draw the single line diagram of power system.

Software required:

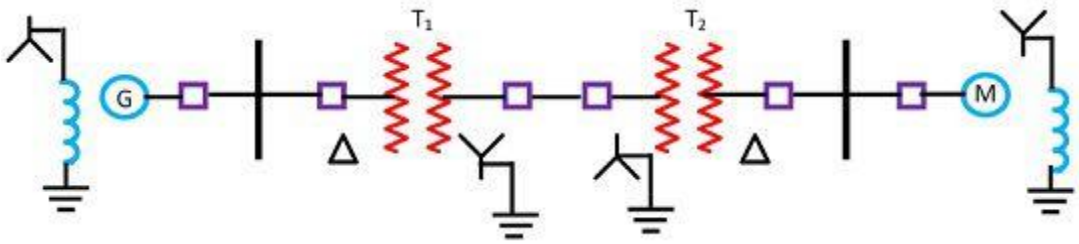


FIGURE 10.1 SINGLE LINE DIAGRAM OF POWER SYSTEM

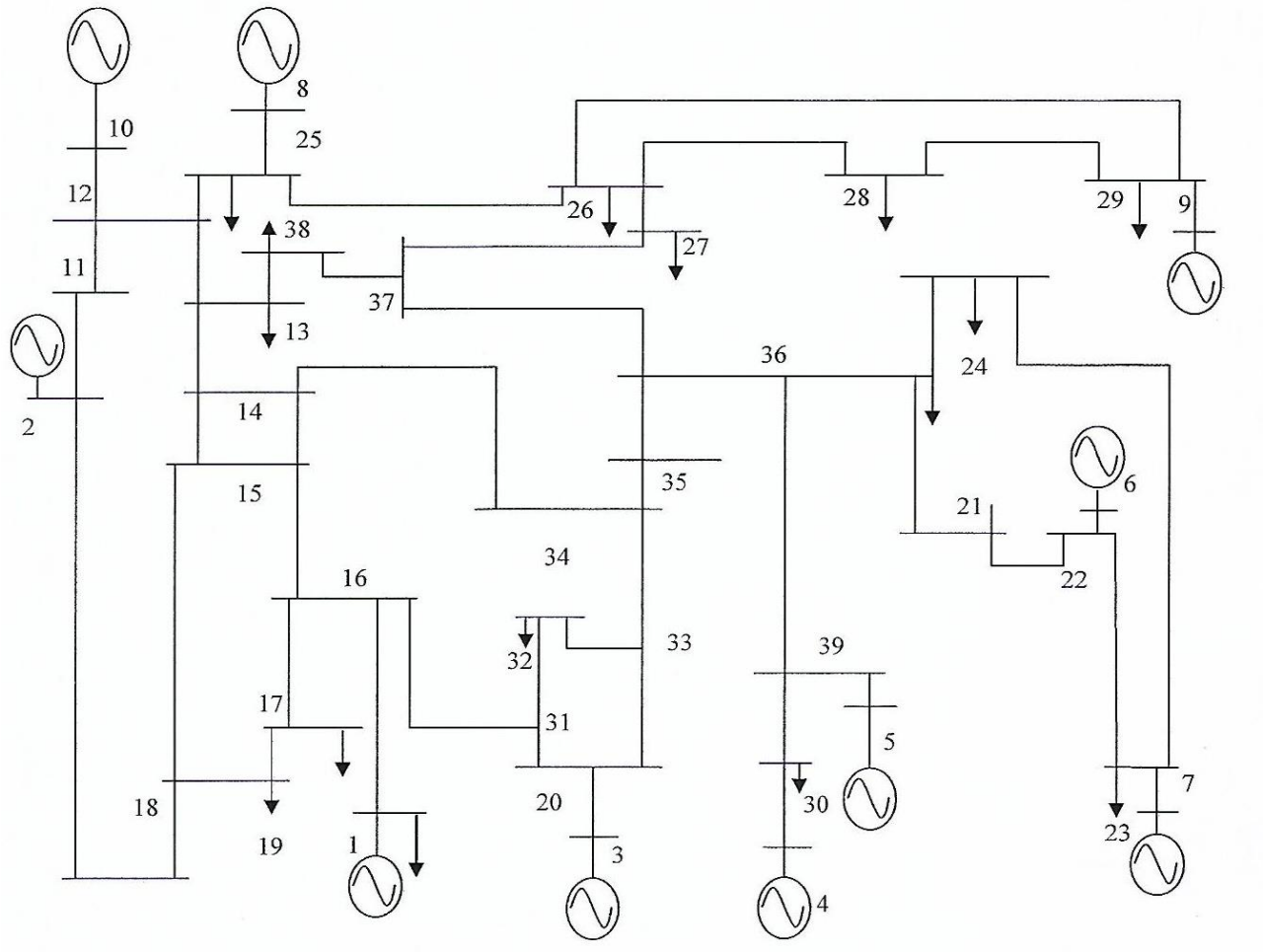


FIGURE 10.2 SINGLE LINE DIAGRAM OF POWER SYSTEM

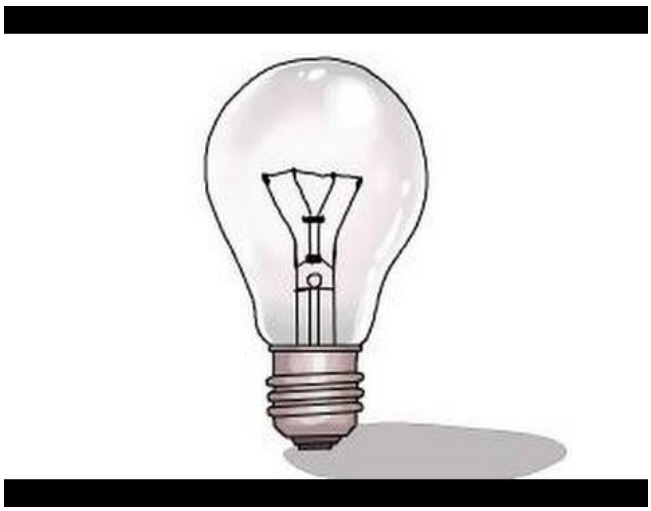
Results:

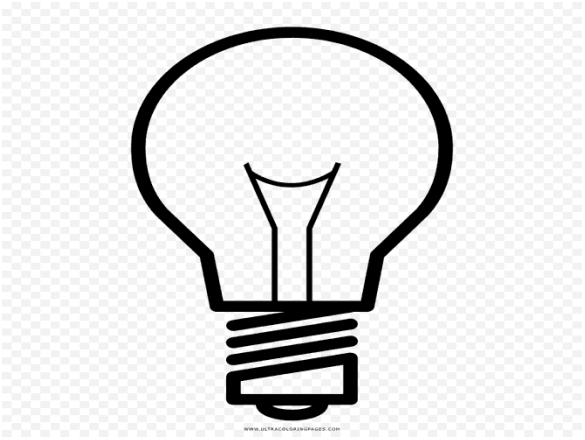
Experiment: 11 **Date:**

Design of Incandescent Lamp (3D MODEL)

Aim: To draw. Incandescent Lamp using ECAD

Software required: ECAD, AUTOCAD software





RESULT:

Experiment: 12 **Date:**

Design of Fluorescent Lamp (3-D MODEL)

Aim: To draw. Fluorescent Lamp using ECAD

Software required: ECAD, AUTOCAD software

RESULT: