University of Global Village (UGV), Barishal

ELECTRICAL SHOP PRACTICE

Sessional Course Content

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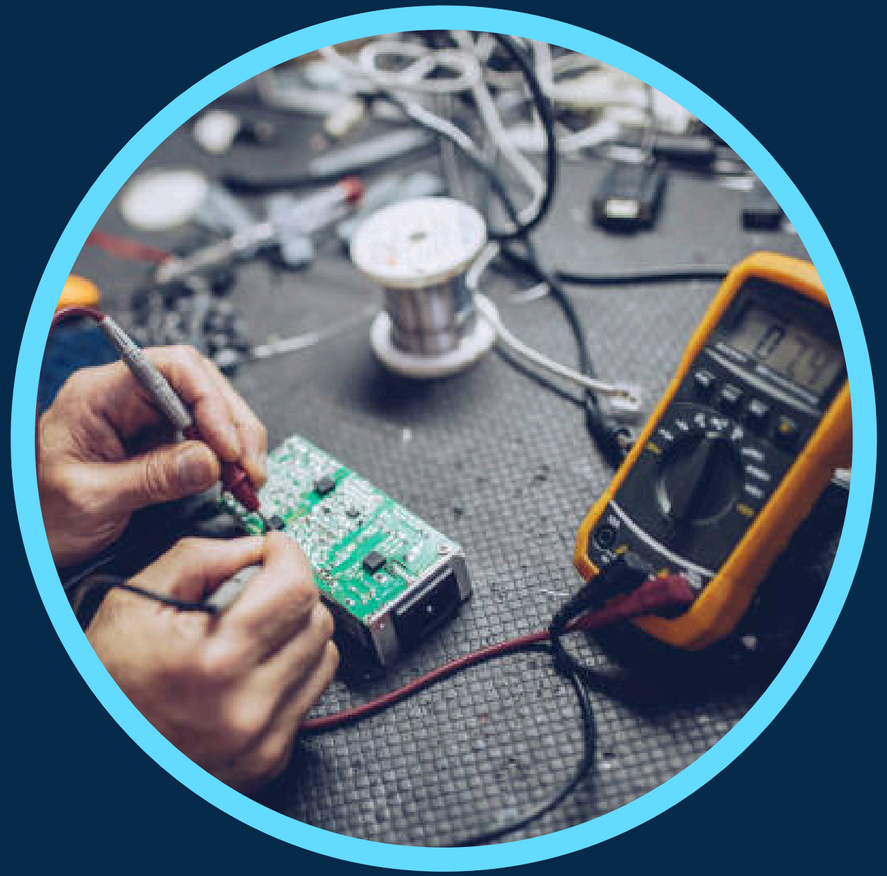
BASIC COURSE INFORMATION

Course Title	Electrical Shop Practice Sessional
Course Code	EEE 0713-2200
Credits	01
Marks	50
Course Type	Sessional Course
Level	4th Semester
Academic Session	Winter 2025



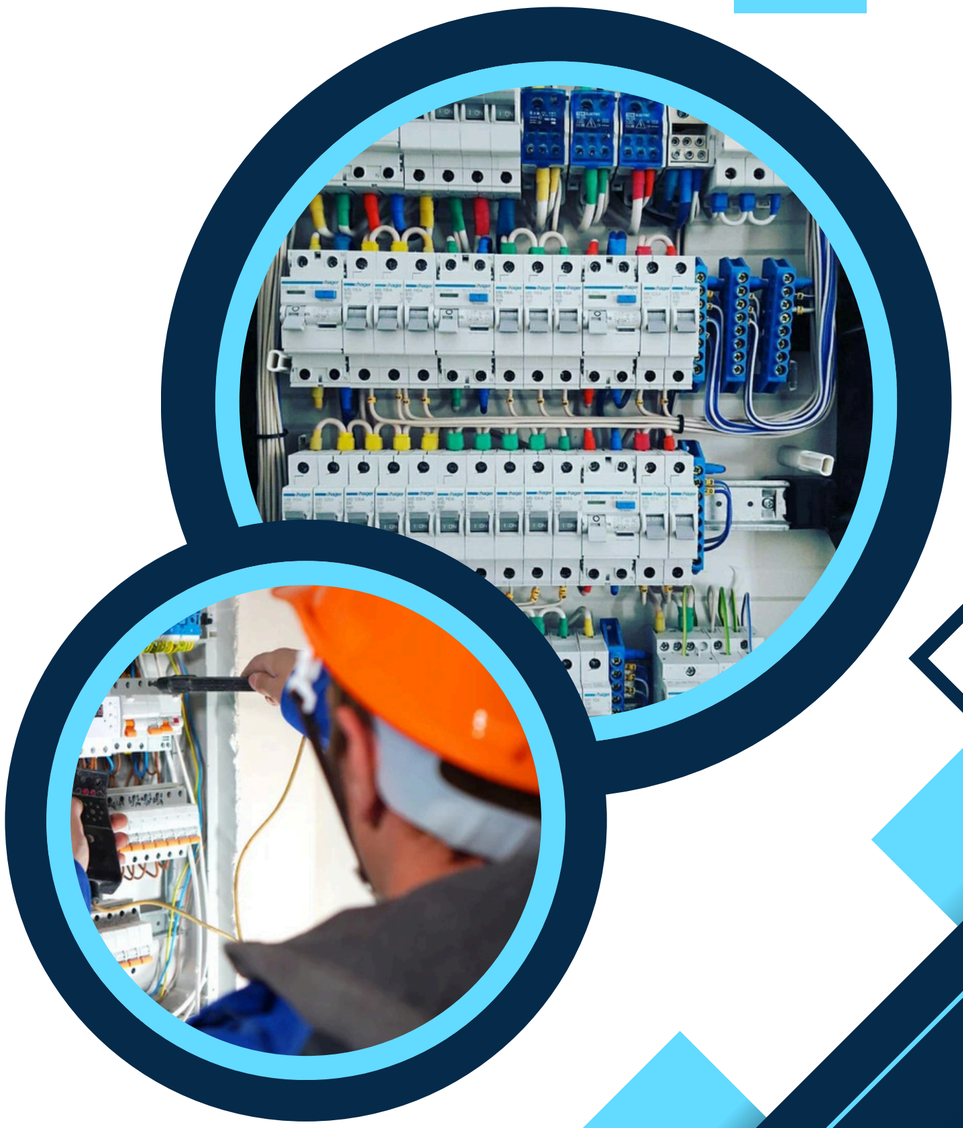
COURSE RATIONALE

Modern building design now integrates electrical wiring system with new services. Functional, safe, and green designs done in compliance with standards and codes play a key role in proper urban and industrial development. This course will prepare the students to design effective building services systems.

COURSE OBJECTIVES

The objectives of the course are to introduce to students how to

- Design building electrical wiring systems.
- Carry out basic calculations associated with the electric power demand and distribution in a building.
- Use the applicable Standards and codes in the process of designing electrical building services.
- Prepare basic technical documentation of a building services system.
- Consider safety and health issues in building wiring and service systems.



COURSE LEARNING OUTCOMES (CLOS)

CLO 1

Analyze electrical power demand in a building based on customer needs.

CLO 2

Design electrical wiring complete layout including fitting, fixture, switchboard, and distribution board subject to specifications and constraints considering applicable standards and codes.

CLO 3

Design electrical building service systems subject to specifications and constraints considering applicable standards and codes.

CLO 4

Prepare and present basic technical documentation of a building services system.

COURSE PLAN MAPPED WITH CLO

Week No.	Experiment Name	Learning Outcomes	Theory Time (Hours)	Practical Time (Hours)	Alignment to CLO
1 - 2.	Study of Various Electrical Symbols And Tools.	Through the experiment on the study of various electrical symbols and tools, students gained foundational knowledge of interpreting electrical schematics and identifying essential tools used in electrical work.	04	06	CLO 1 CLO 2
3 - 4.	Study Of Electrical Components.	Students with a practical understanding of the fundamental electrical components such as resistors, capacitors, inductors, and diodes.	04	06	CLO 2 CLO 3
5.	One Way And Two Way Control.	The learning outcome of the experiment on One Way and Two Way Control is that students will gain hands-on experience in controlling the operation of a load from multiple locations using one-way and two way switching systems.	02	03	CLO 1 CLO 2

COURSE PLAN MAPPED WITH CLO

Week No.	Experiment Name	Learning Outcomes	Theory Time (Hours)	Practical Time (Hours)	Alignment to CLO
6-7.	Lamp Controlled From Three Different Places.	Enables students to understand the concept of a three-way switching circuit, demonstrating how a lamp can be controlled from multiple locations using multiple switches.	04	06	CLO 1 CLO 2
8-9.	Living Room Wiring.	Equip students with practical skills in designing and wiring electrical circuits for a typical living room setup.	04	06	CLO 2 CLO 3
10.	Godown Wiring.	Students will gain practical knowledge in designing and installing electrical wiring systems for warehouses (godowns), focusing on safety, efficiency, and compliance with electrical standards.	02	03	CLO 1 CLO 2

COURSE PLAN MAPPED WITH CLO

Week No.	Experiment Name	Learning Outcomes	Theory Time (Hours)	Practical Time (Hours)	Alignment to CLO
11.	Doctors Room Wiring	The learning outcome of the "Doctor's Room Wiring" experiment is to understand the importance of safe and efficient electrical wiring in medical environments.	02	03	CLO 1 CLO 2
12-13.	Fan Wiring	The learning outcome of the "Fan Wiring" experiment is to understand the wiring techniques and methods used in connecting a fan to an electrical circuit, ensuring proper operation and safety.	04	06	CLO 2 CLO 3
14-15.	Tube Light Wiring	The learning outcome of the Tube Light Wiring experiment is for students to understand the practical aspects of wiring and connecting a tube light circuit, including the correct installation of components like the starter, choke, and tube light.	04	06	CLO 1 CLO 2

COURSE PLAN MAPPED WITH CLO

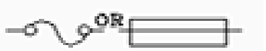
Week No.	Experiment Name	Learning Outcomes	Theory Time (Hours)	Practical Time (Hours)	Alignment to CLO
16-17.	Volt Ammeter Method	The learning outcome of the Volt-Ammeter Method experiment is to understand the relationship between the voltage and current of a given electrical device, allowing students to calculate its power consumption.	04	06	CLO 1 CLO 2

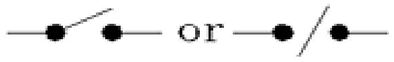
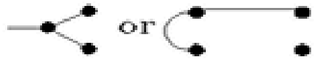
SAFETY RULES

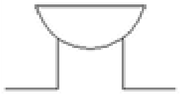
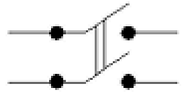
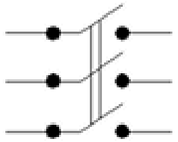
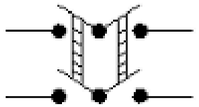
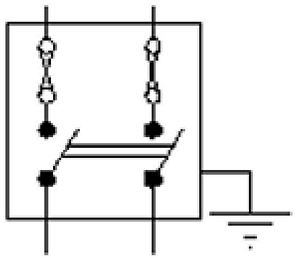
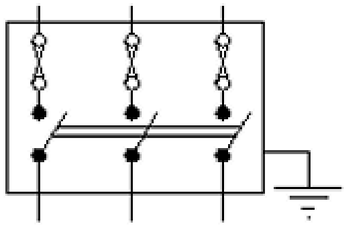
1. Do not touch any terminals (or) Switch without ensuring that it is dead.
2. Wearing shoes with rubber sole is desirable.
3. Use a fuse wire of proper rating.
4. Use sufficient long connecting leads rather than joining two or there small ones, because in case any joint is open it could be dangerous.
5. Make sure that all the electrical connections are correct before switching on any circuit. Wrong connections may cause large amount of current which results damage of equipment.
6. The circuit should be de-energized while changing any connection.
7. In case of emergency or fire switch-off the master switch on the main panel board.
8. Keep away from all the moving parts as for as possible.
9. Do not renew a blown fuse until you are satisfied to the cause and rectified problem.
10. Do not touch an electric circuit when your hands are wet or bleeding from a cut.

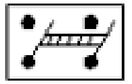
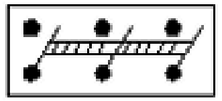
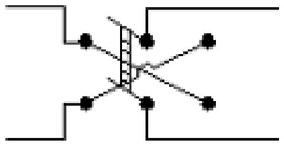
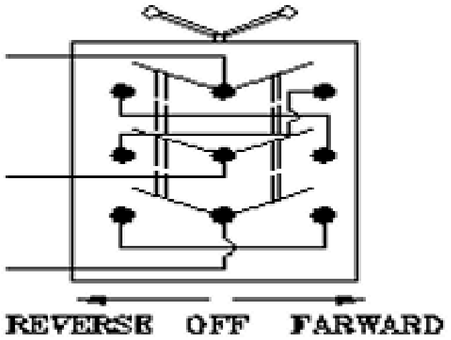
Experiment No. 1 : STUDY OF VARIOUS ELECTRICAL SYMBOLS AND TOOLS

Aim: To study the various electrical symbols and tools

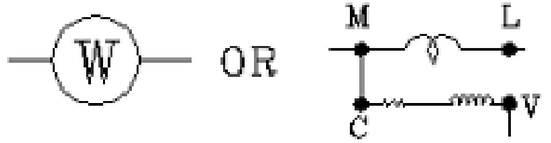
Sl.No.	Name of the Symbol	Symbol
1	Direct Current	=
2	Positive	+
3	Negative	_
4	Alternating Current	~
5	Single phase	1Ø or 1 ~
6	Three phase	3Ø or 3 ~
7	Phase sequence	**R Y B**
8	Neutral	N or ± or O
9	Crossed wires	
10	Connected wires	
11	Earth	
12	Fuse (TCC wire)	
13	Cartridge Fuse	
14	Porcelain Connector Single Way	

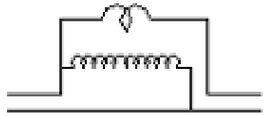
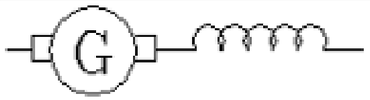
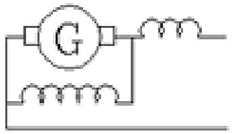
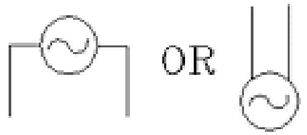
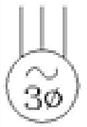
15	Neutral Link	
16	Single pole Switch	
17	Two-way Switch	
18	Push button Switch	
19	Intermediate Switch	
20	Lamp	
21	Lamp in Series	
22	Lamp in parallel or Lamp Load	
23	Fan	
24	Fan Regulator	
25	Two-Pin Wall socket	
26	Three-Pin Wall socket	
27	Two-Plate Ceiling Rose	
28	Three-Plate Ceiling Rose	

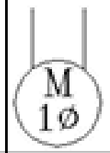
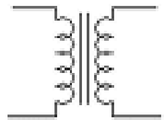
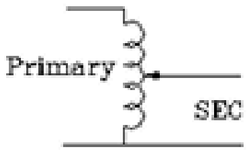
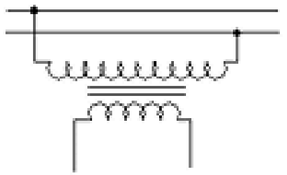
Sl.No.	Name of the Symbol	Symbol
29	Electric bell	
30	Electric Buzzer	
31	Double-pole switch	
32	Triple-pole switch	
33	Knife blade, double-pole, double-throw switch	
34	Double pole, iron clad main switch with fuses	
35	Triple- pole, iron clad main switch with fuses	

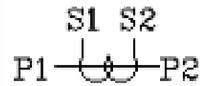
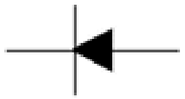
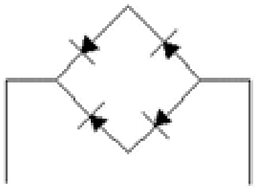
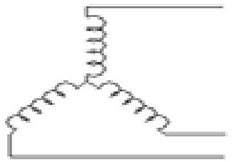
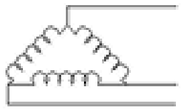
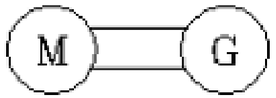
36	Oil immersed single-pole switch	
37	Oil immersed double-pole switch	
38	Oil immersed triple-pole switch	
39	Reversing Switch (double pole)	
40	Reversing Switch iron clad (triple pole)	
41	Fixed Resistance	

42	Variable Resistance	
43	Coil (inductive coil or reactor)	
44	Variable inductive coil	
45	Choke coil	
46	Fixed Condenser(Capacitor)	
47	Variable Condenser(Capacitor)	
48	Cell	
49	Battery	
50	Ampere meter or Ammeter (i)ac, (ii)dc, (iii) ac/dc	
51	Volt meter (i)ac, (ii)dc, (iii) ac/dc	

52	Watt meter	
53	Ohm meter	
54	Multi meter	
55	Phase indicator meter	
56	Power factor meter	
57	Frequency meter	
58	Galvanometer	

Sl.No.	Name of the Symbol	Symbol
59	Synchroscope	
60	Single phase energy meter	
61	Series Generator (or Motor)	
62	Shunt Generator (or Motor)	
63	Compound Generator (or Motor)	
64	Single-phase Supply(Source)	
65	Three-phase alternator(Source)	

66	Single-phase motor	
67	Three-phase Squirrel cage induction motor	
68	Three-phase slip-ring induction motor	
69	Single-phase Transformer	
70	Single-phase Auto-Transformer	
71	Potential Transformer	

Sl.No.	Name of the Symbol	Symbol
72	Current Transformer	
73	Half-wave metal rectifier	
74	Full-wave metal rectifier	
75	Star Connection	
76	Delta Connection	
77	Rotary Converter	
78	Motor-Generator set (mechanically coupled)	

Experiment No. 2 : STUDY OF ELECTRICAL COMPONENTS

AIM: To study various types of Volt meters, Ammeters and Watt-meters.

APPARATUS:

S.No	Meter	Type	Range		Qty
1	Voltmeter	MC			1
2	Ammeter	MC			1
3	Watt meter	UPF			1
4	Rheostats	WW	R1		1
5	Fuse wire	TCC			10C ms

Voltmeters: Voltmeter is a measuring instrument used to measure the voltage or potential difference across the circuit. Electric voltage is measured in volts.

Fig.1 Symbolic representation of voltmeter

- Voltmeters measure voltage.
- Voltage is measured in volts, V.
- Voltmeters are connected in parallel across components.
- Voltmeters have high resistance.

Circuit Diagram:

Ammeter: An ammeter is a measuring instrument used to measure the electric current in a circuit.

Fig.3 Symbolic representation of ammeter.

- Ammeters measure current.
- Current is measured in amps (amperes).
- Ammeters are connected in series(To connect in series break the path of circuit and put the ammeter across the gap, as shown in the diagram).
- Ammeters have a very low resistance.

Circuit Diagram:

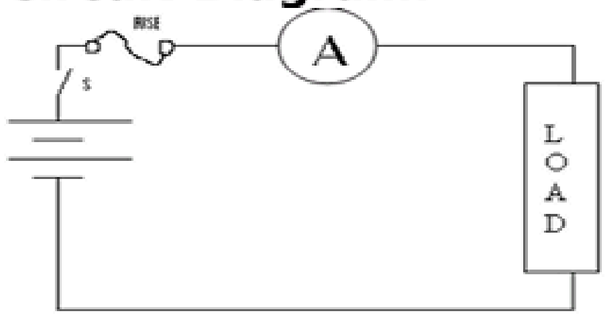


Fig.4 Connecting an ammeter in series

To connect volt meters:

It is important to connect meters the correct way round:

- The positive terminal of the meter, marked + or coloured red should be connected nearest to + on the battery or power supply.
- The negative terminal of the meter, marked - or coloured black should be connected nearest to - on the battery or power supply.

Wattmeter:The Wattmeter is an instrument for measuring the **electric power** or the rate of **electrical energy** (Watts) supplied/absorbed by any given **circuit**.

Electrodynamic wattmeter: The traditional analog wattmeter is an ***electrodynamic*** instrument. The device consists of a pair of fixed ***coils***, known as potential coils, and a movable coil known as the current coil. The current coils connected in ***series*** with the circuit, while the potential coil is connected in ***parallel***. The current coil carries a needle that moves over a scale to indicate the measurement. A current flowing through the pressure coil generates an ***electromagnetic field*** around the coil. The strength of this field is proportional to the line current and in phase with it. The potential coil has, as a general rule, a high-value ***resistor*** connected in series with it to reduce the current that flows through it. The result of this arrangement is that on a ***dc*** circuit, the deflection of the needle is proportional to both the ***current*** and the ***voltage***, thus the equation W=VA or P=EI. On an ***ac*** circuit the deflection is proportional to the average instantaneous product of voltage and current, thus measuring true power, and possibly (depending on load characteristics) showing a different reading to that obtained by simply multiplying the readings showing on a stand-alone ***voltmeter*** and a stand-alone ***ammeter*** in

the same circuit. The position of the pointer depends on the ***power factor***, ***voltage*** and ***current*** thus the equation W=VAcosϕ or P=EIcosϕ where cosϕ is the power factor and ϕ is the phase angle between voltage and current. Thus, a circuit with a low ***power factor*** will give a low reading on the wattmeter, even when both of its circuits are loaded to the maximum safety limit. Therefore, a wattmeter is rated not only in ***watts***, but also in ***volts*** and ***amperes***. Following is the symbolic representation of wattmeter where ML is the cuurent coil and CV is the pressure coil.

SYMBOL :

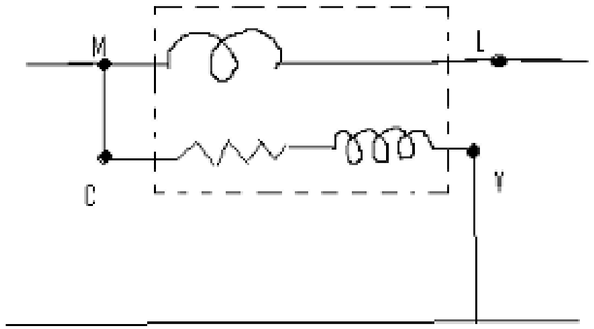


Fig.5 Symbolic representation of wattmeter

Circuit Diagram:

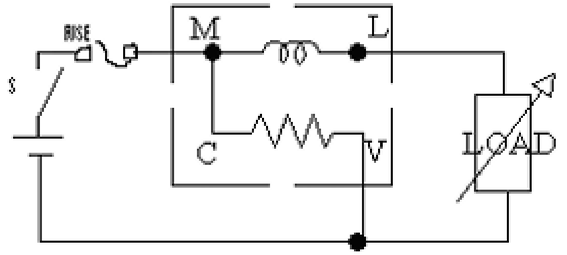


Fig.6 Wattmeter in a circuit

Experiment No. 3 : ONE-WAY AND TWO-WAY CONTROL

Aim: To control a lamp by one-way and two-way control.

Tools Required:

S.No	Name of the tool	Size	Qty
1.	Combination-pliar	15cm	1
2.	Screw Driver	15cm	1
3.	Connector	10cm	1
4.	Hammer	0.5Kg	1
5.	Electrician knife		1
6.	Tester	500V	1
7.	Hacksaw frame	30cm	1

Equipment Required:

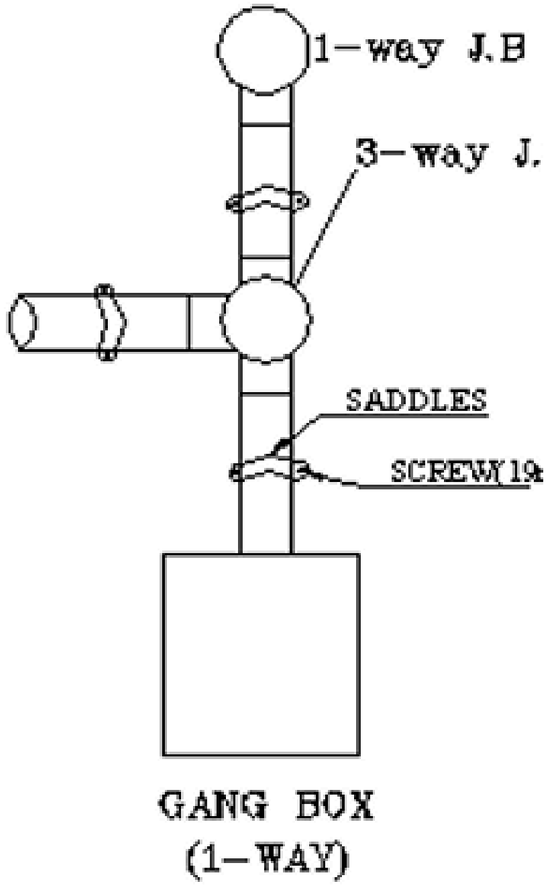
S.No	Name of the equipment	Type/Range	Qty
1.	PVC Insulated wire	1.5Sqmm	5Mts
2.	PVC Conduit	19mm	3Mts
3.	Saddles	19mm	5Nos
4.	Wooden screws	19mm	9Nos
5.	Gang boxes	1-way	2Nos
6.	Junction boxes	1-way 2-way L-type 3-way	1 1 2
7.	Switches	2-way,240V/5A	2
8.	Batten holders	Pin type,240V/5A	1
9.	Bulb(Incandescent)	Pin type,240V/5A	1
10	PVC insulation tape		

i) One-way Control:

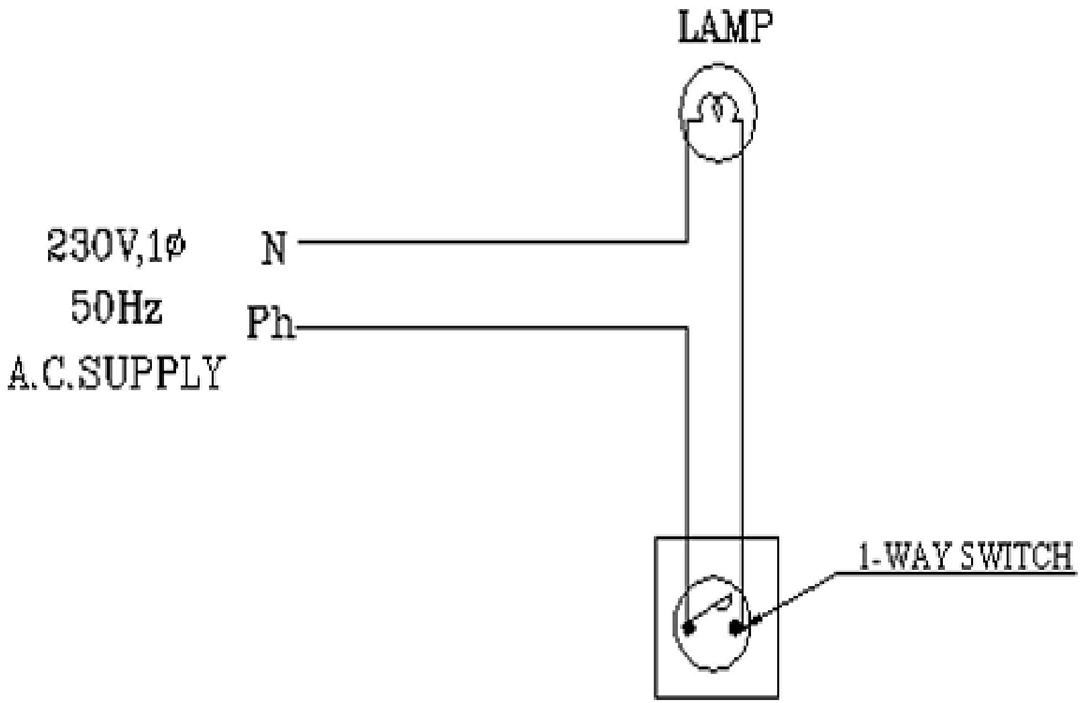
Circuit Diagram:

Layout:

Diagram:



Wiring



Procedure:

1. The PVC conduits, gang boxes, junction boxes and batten holder are fixed on the wiring board using saddles and wooden screws as shown in the layout diagram.
2. The 1.5Sqmm PVC wire is laid in conduits as shown in wiring diagram.
3. Switches are fixed and the connections are made as shown in wiring diagram.
4. After checking the circuit, 1-Ø,230V,50Hz, supply is given to the circuit.
5. Working of the Fan and Tube Light are verified.

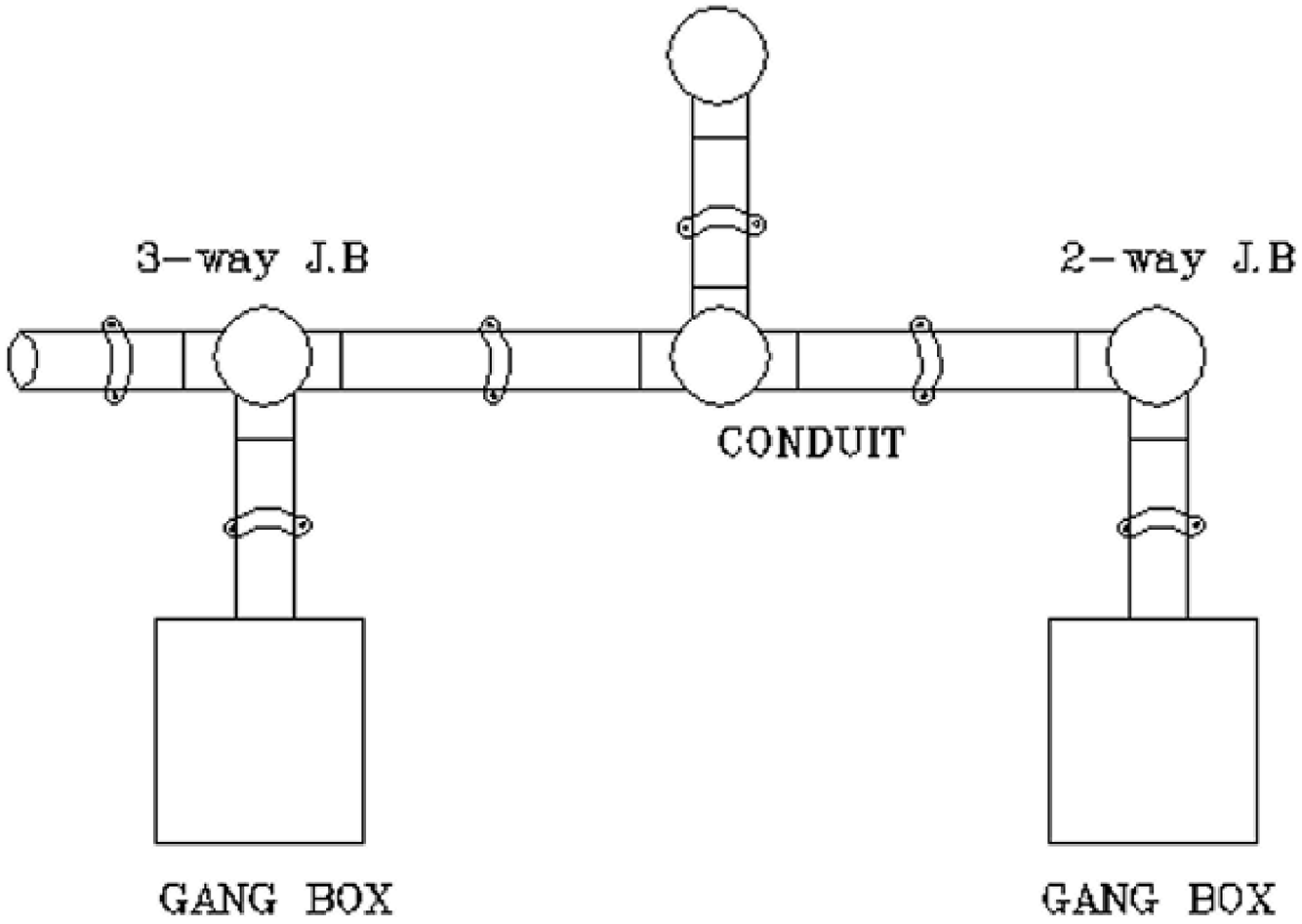
Precautions:

1. Make the connections correctly.
2. Make all connections tightly.
3. Check the circuit before giving the supply.
4. Use proper range equipment.

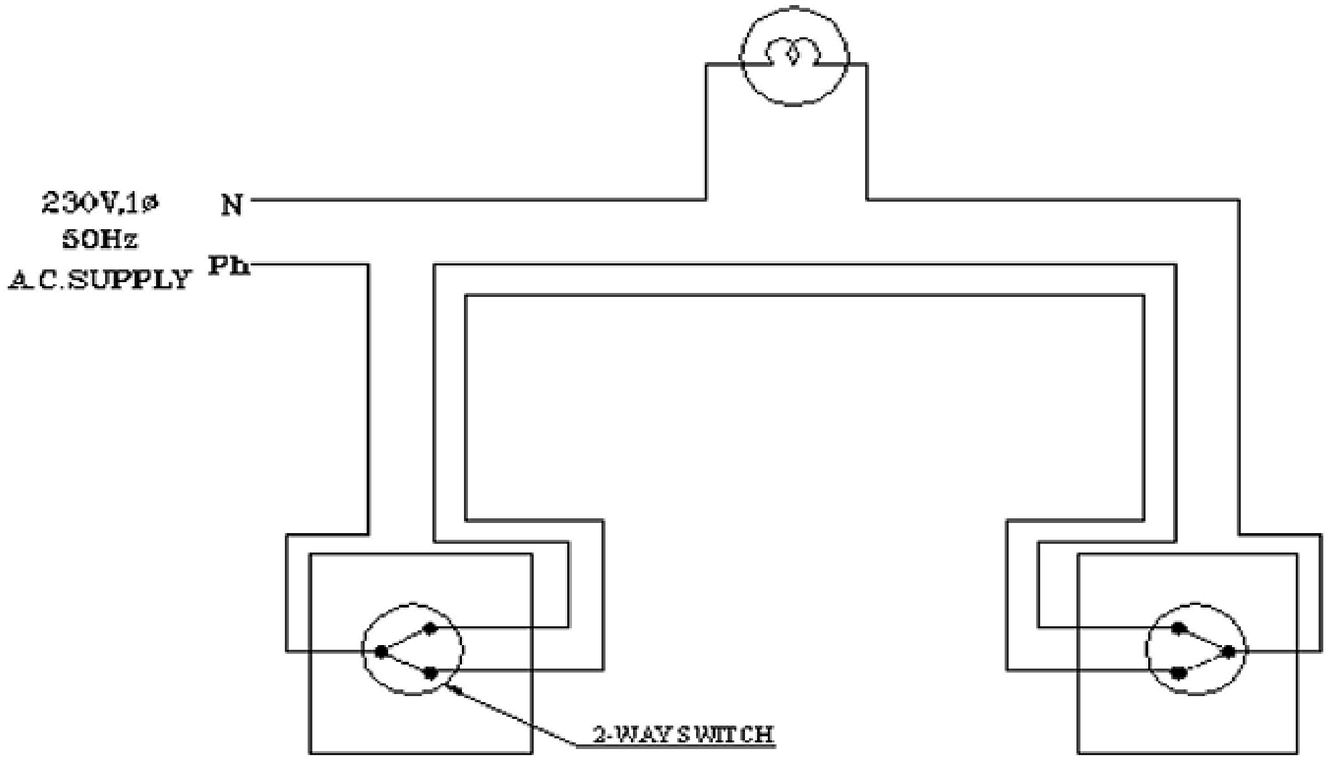
ii) **Two-way Control:**

Circuit Diagram:

Layout:



Wiring Diagram:



Procedure:

1. The PVC conduits, gang boxes, junction boxes and batten holder are fixed on the wiring board using saddles and wooden screws as shown in the layout diagram.
2. The 1.5Sqmm PVC wire is laid in conduits as shown in wiring diagram.
3. Switches are fixed and the connections are made as shown in wiring diagram.

4. After checking the circuit, 1-Ø, 230V, 50Hz, supply is given to the circuit.
5. Working of the lamp is verified from the two different places.

Precautions:

1. Make the connections correctly.
2. Make all connections tightly.
3. Check the circuit before giving the supply.
4. Use proper range equipment.

Experiment No. 4 : A LAMP CONTROLLED FROM THREE DIFFERENT PLACES

Aim: To control a lamp from three different places.

Tools Required:

S.No	Name of the tool	Size	Qty
1.	Combination plier	15cm	1
2.	Screw Driver	15cm	1
3.	Connector	10cm	1
4.	Hammer	0.5Kg	1
5.	Electrician knife		1
6.	Tester	500V	1
7.	Hacksaw frame	30cm	1

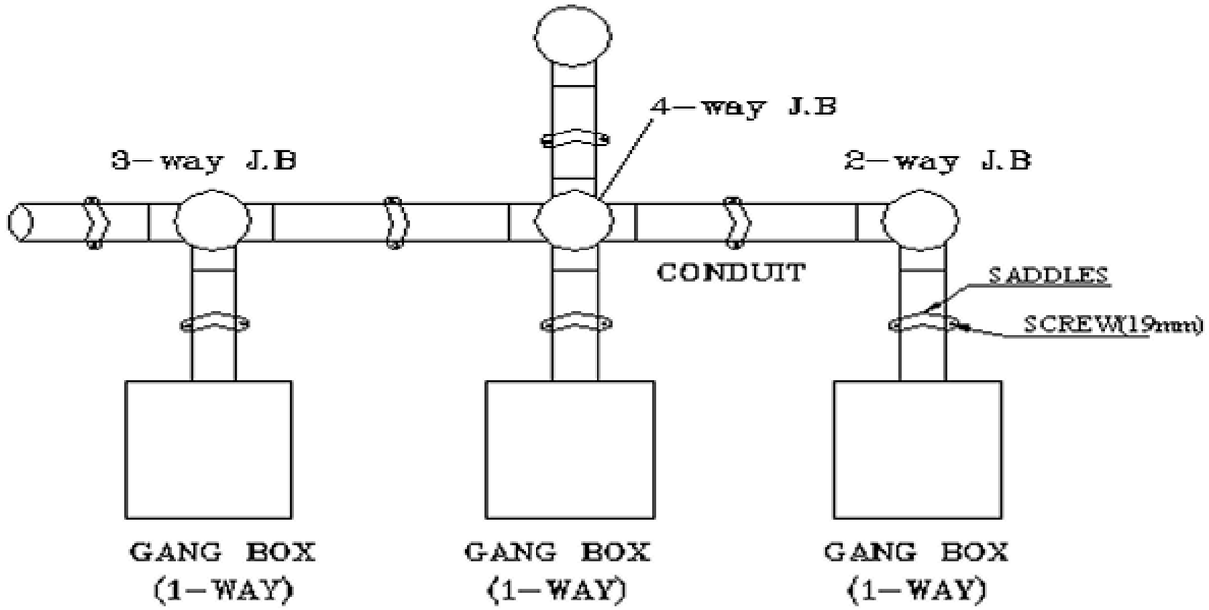
Equipment Required:

S.No	Name of the equipment	Type/Range	Qty
1.	PVC Insulated wire	1.5Sqmm	5Mts(app)
2.	PVC Conduit	19mm	3Mts(app)
3.	Saddles	19mm	7Nos

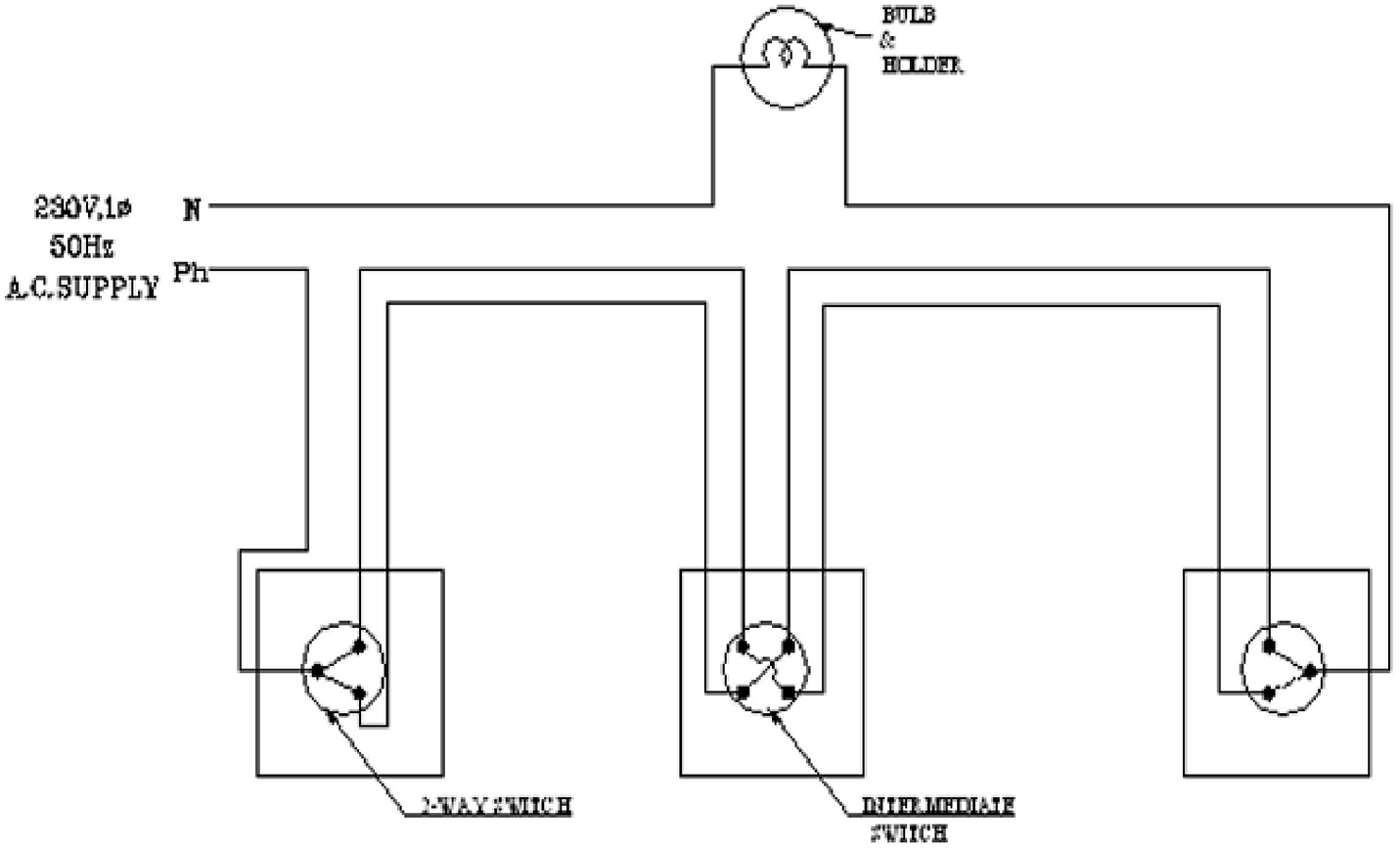
4.	Wooden screws	19mm 38mm	14Nos 8Nos
5.	Gang boxes	1-way	3Nos
6.	Junction boxes	1-way 2-way L-type 3-way 4-way	1 1 1 1
7.	Switches	2-way,240V/5A Intermediate,240V/5 A	2 1
8.	Batten holders	Pin type,240V/5A	1
9.	Bulb(Incandescent)	Pin type,240V/5A	1
10	PVC insulation tape		

Circuit Diagram:

Layout:



Wiring Diagram:



Procedure:

1. The PVC conduits, gang boxes, junction boxes and batten holder are fixed on the wiring board using saddles and wooden screws as shown in the layout diagram.
2. The 1.5Sqmm PVC wire is laid in conduits as shown in wiring diagram.

3. Switches are fixed and the connections are made as shown in wiring diagram.
4. After checking the circuit, 1-Ø, 230V, 50Hz, supply is given to the circuit.
5. Working of the lamp is verified from the three different places.

Precautions:

1. Make the connections correctly.
2. Make all connections tightly.
3. Check the circuit before giving the supply.
4. Use proper range equipment.

Experiment No. 5 : LIVING ROOM WIRING

Aim: To do the living room wiring.

Tools Required:

S.No	Name of the tool	Size	Qty
1.	Combination plier	15cm	1
2.	Screw Driver	15cm	1
3.	Connector	10cm	1
4.	Hammer	0.5Kg	1
5.	Electrician knife		1
6.	Tester	500V	1
7.	Hacksaw frame	30cm	1

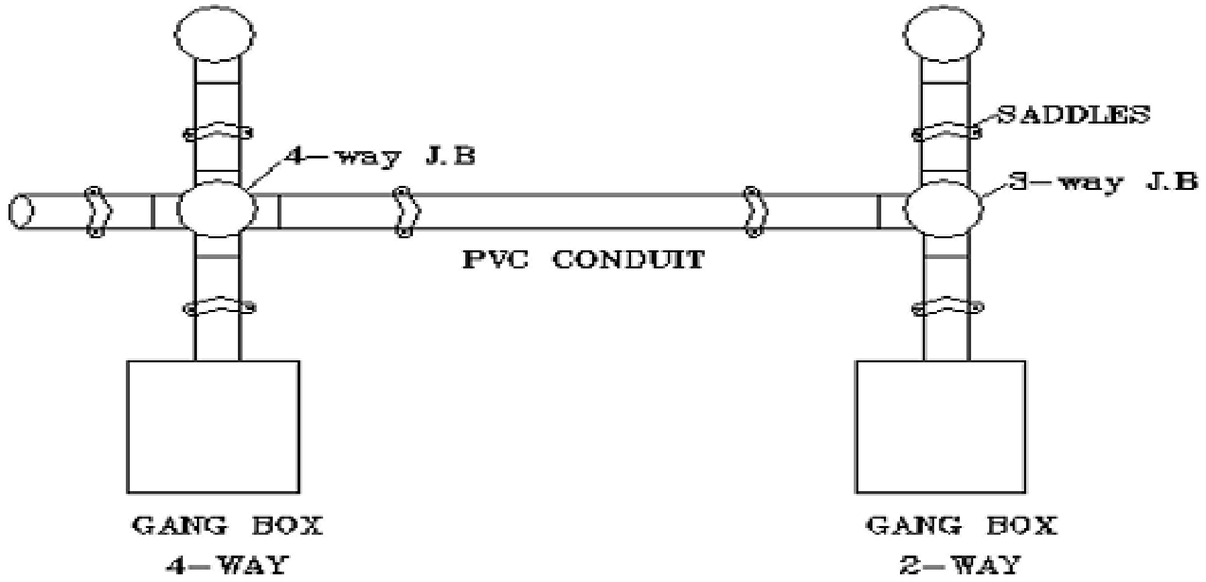
Equipment Required:

S.No	Name of the equipment	Type/Range	Qty
1.	PVC Insulated wire	1.5Sqmm	10Mts(app)
2.	PVC Conduit	19mm	3Mts(app)
3.	Saddles	19mm	7Nos
4.	Wooden screws	19mm 38mm	14Nos 8Nos
5.	Gang boxes	2-way 4-way	1 1
6.	Junction boxes	1-way 2-way(L-type) 3-way 4-way	2 1 1 1
7.	Switches	1-way,240V/5A 2-way,240V/5A	1 4

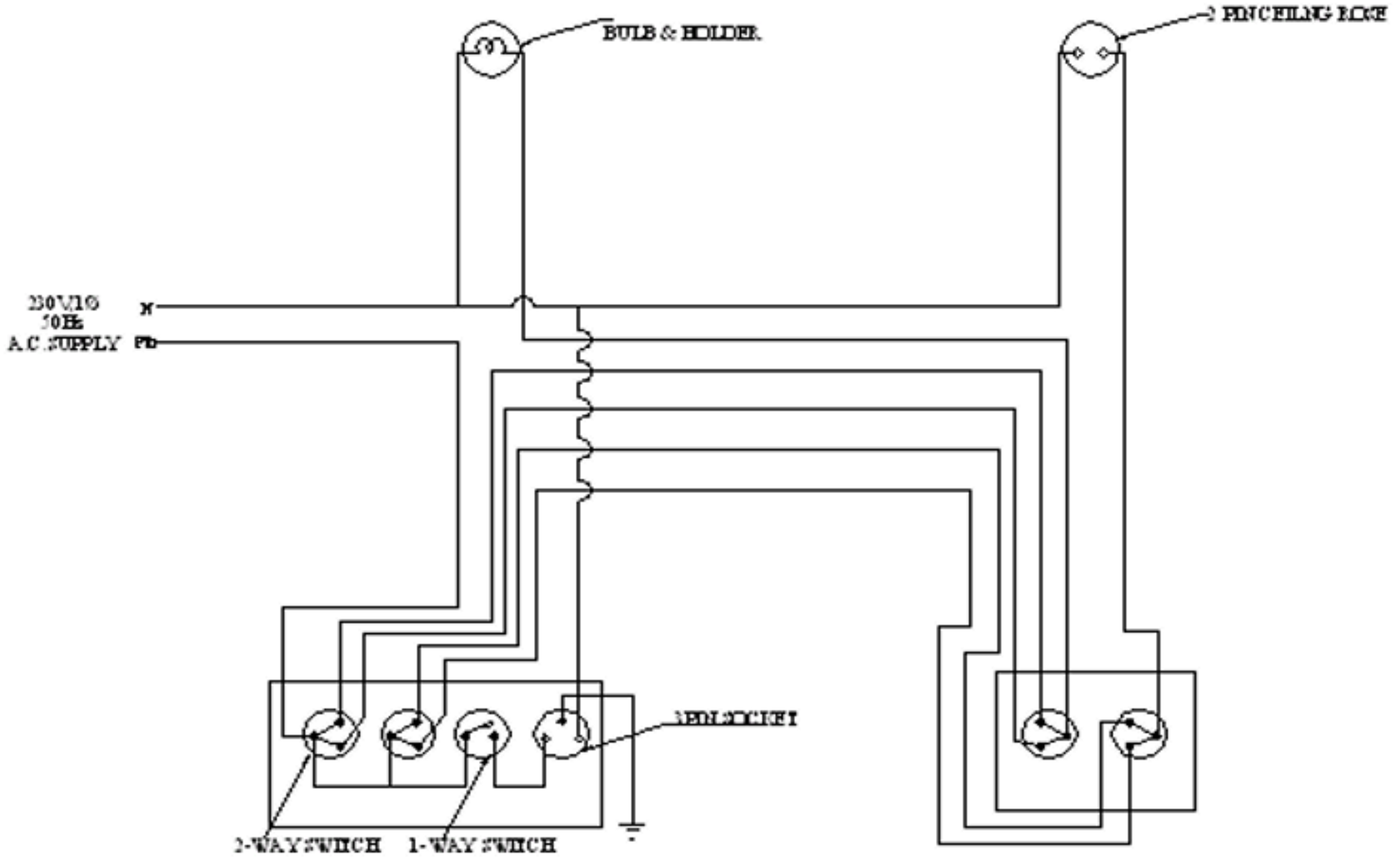
8.	Socket	3-Pin,240V/5A	1
9.	Ceiling Rose	2-Pin,240V/5A	1
10	Batten Holders	Pin type,240V/5A	1
11.	Bulb (Incandescent)	Pin type,240V/40W	1
12.	PVC insulation tape		

Circuit Diagram:

Layout:



Wiring Diagram:



Procedure:

1. The PVC conduits, gang boxes, junction boxes and batten holder are fixed on the wiring board using saddles and wooden screws as shown in the layout diagram.
2. The 1.5Sqmm PVC wire is laid in conduits as shown in wiring diagram.
3. Switches are fixed and the connections are made as shown in wiring diagram.
4. After checking the circuit, 1-Ø, 230V, 50Hz, supply is given to the circuit.
5. Working of the lamp with living room wiring is verified.

Experiment No. 6 : GODOWN WIRING

Aim: To do the Godown wiring.

Tools Required:

S.No	Name of the tool	Size	Qty
1.	Combination plier	15cm	1
2.	Screw Driver	15cm	1
3.	Connector	10cm	1
4.	Hammer	0.5Kg	1
5.	Electrician knife		1
6.	Tester	500V	1
7.	Hacksaw frame	30cm	1

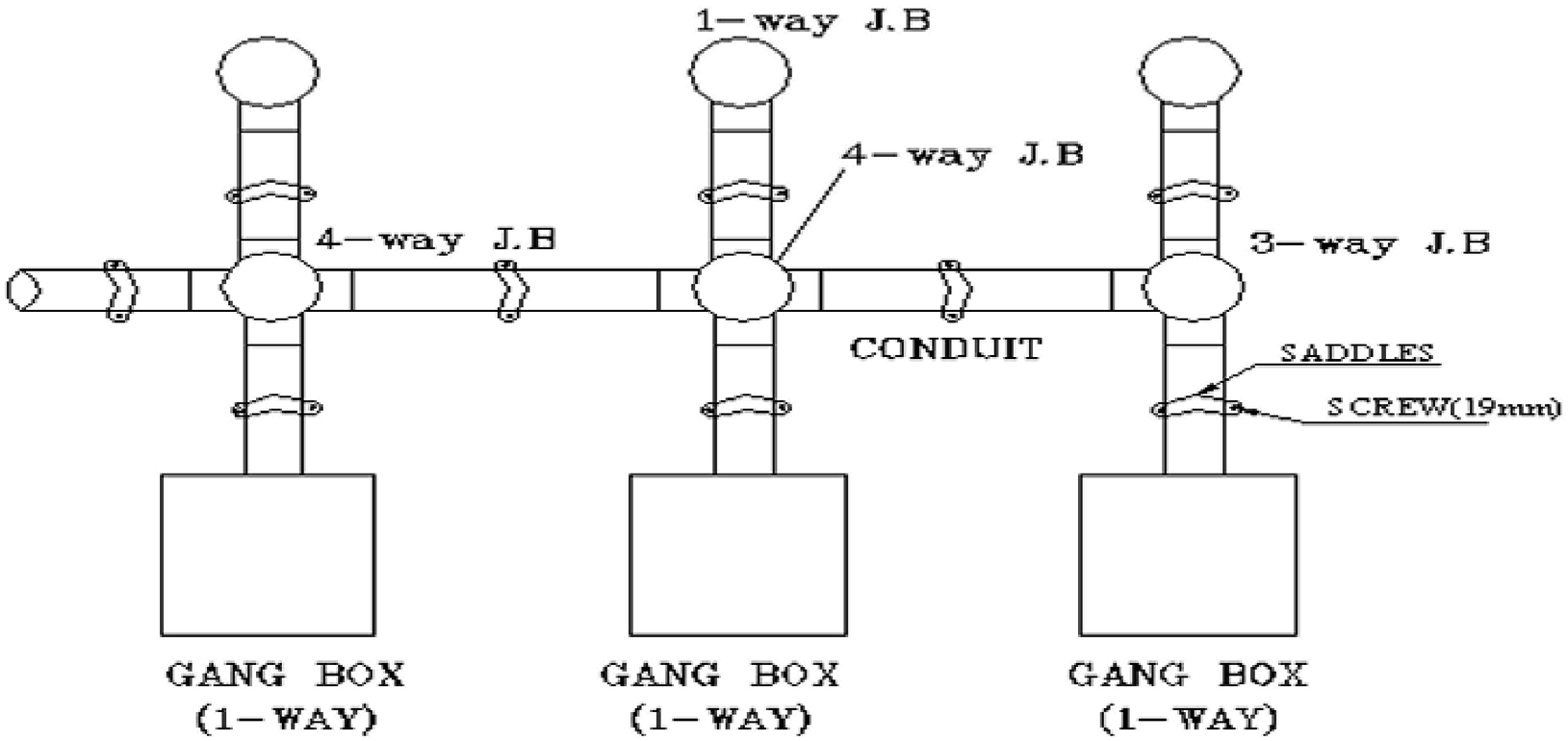
Equipment Required:

S.No	Name of the equipment	Type/Range	Qty
1.	PVC Insulated wire	1.5Sqmm	20Mts(app)
2.	PVC Conduit	19mm	5Mts(app)
3.	Saddles	19mm	9Nos
4.	Wooden screws	19mm 38mm	16Nos 10Nos
5.	Gang boxes	2-way	3
6.	Junction boxes	1-way 3-way 4-way	3 1 2
7.	Switches	2-way,240V/5A	4

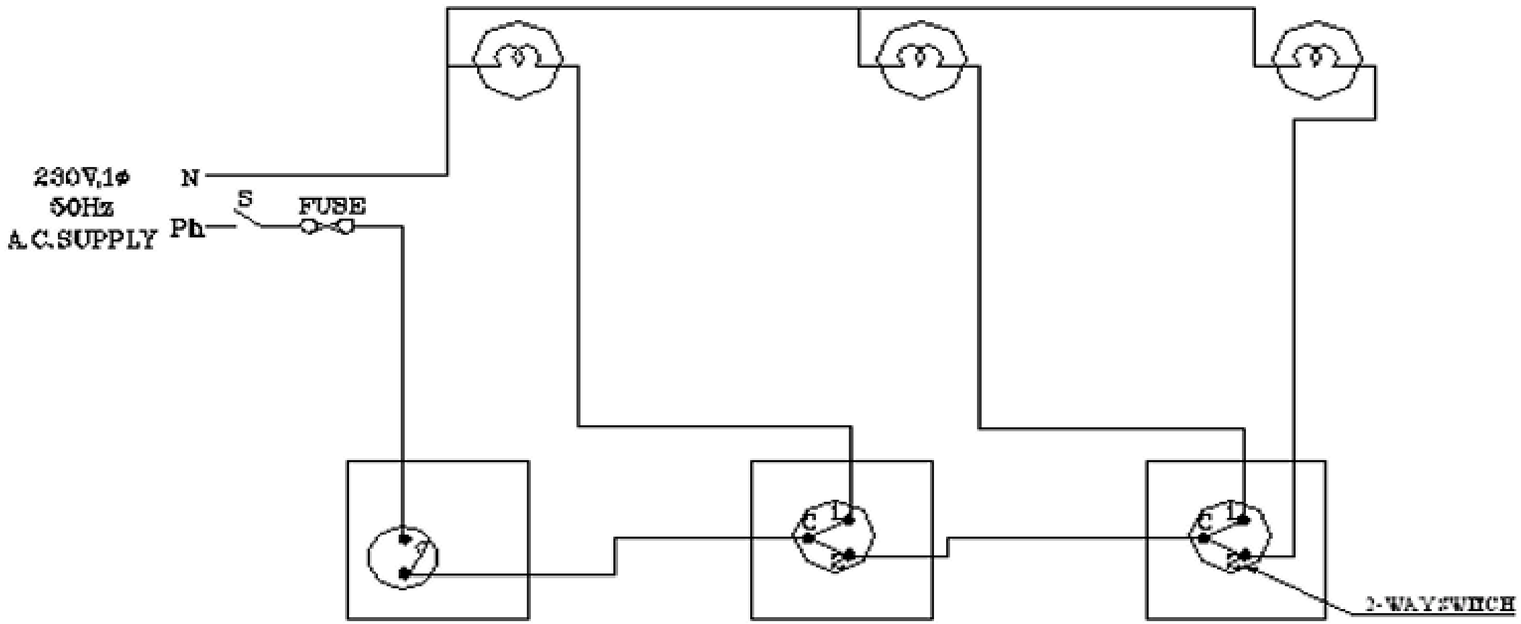
8.	Ceiling Rose	2-Pin,240V/5A	3
9.	Batten Holders	Pin type,240V/5A	3
10	Bulb (Incandescent)	Pin type,240V/40W	1
11.	PVC insulation tape		

Circuit Diagram:

Layout:



Wiring Diagram:



Procedure:

1. The PVC conduits, gang boxes, junction boxes and batten holder are fixed on the wiring board using saddles and wooden screws as shown in the layout diagram.
2. The 1.5Sqmm PVC wire is laid in conduits as shown in wiring diagram
3. Switches are fixed and the connections are made as shown in wiring diagram.
4. After checking the circuit, 1-Ø, 230V, 50Hz, supply is given to the circuit.
5. Working of the lamps with godown wiring is verified from the three places.

Experiment No. 7 : DOCTORS ROOM WIRING

Aim: To do the doctors room wiring.

Tools Required:

S.No	Name of the tool	Size	Qty
1.	Combination plier	15cm	1
2.	Screw Driver	15cm	1
3.	Connector	10cm	1
4.	Hammer	0.5Kg	1
5.	Electrician knife		1
6.	Tester	500V	1
7.	Hacksaw frame	30cm	1

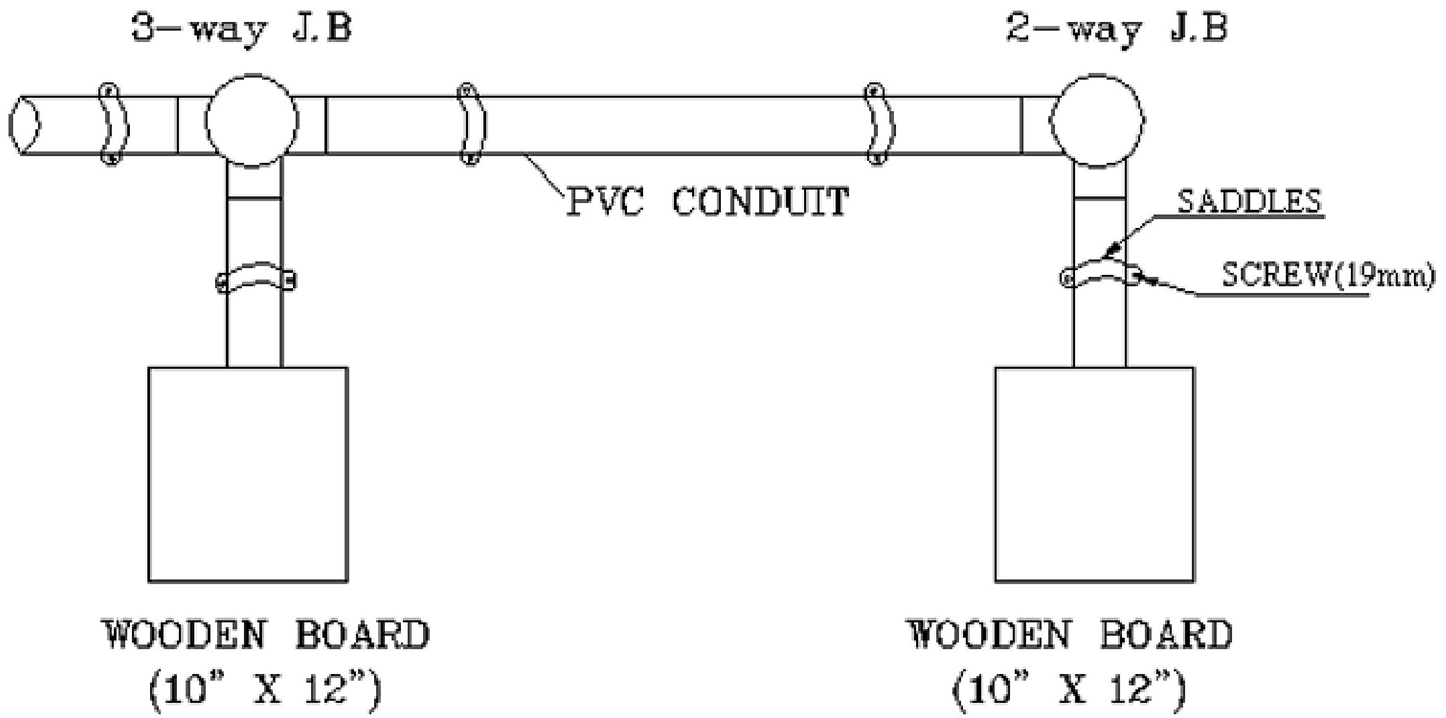
Equipment Required:

S.No	Name of the equipment	Type/Range	Qty
1.	PVC Insulated wire	1.5Sqmm	10Mts(app)
2.	PVC Conduit	19mm	3Mts(app)
3.	Saddles	19mm	5Nos
4.	Wooden screws	19mm 38mm	10Nos 4Nos
5.	Wooden boards	10” X 12”	2Nos
6.	Junction boxes	2-way L-type	1

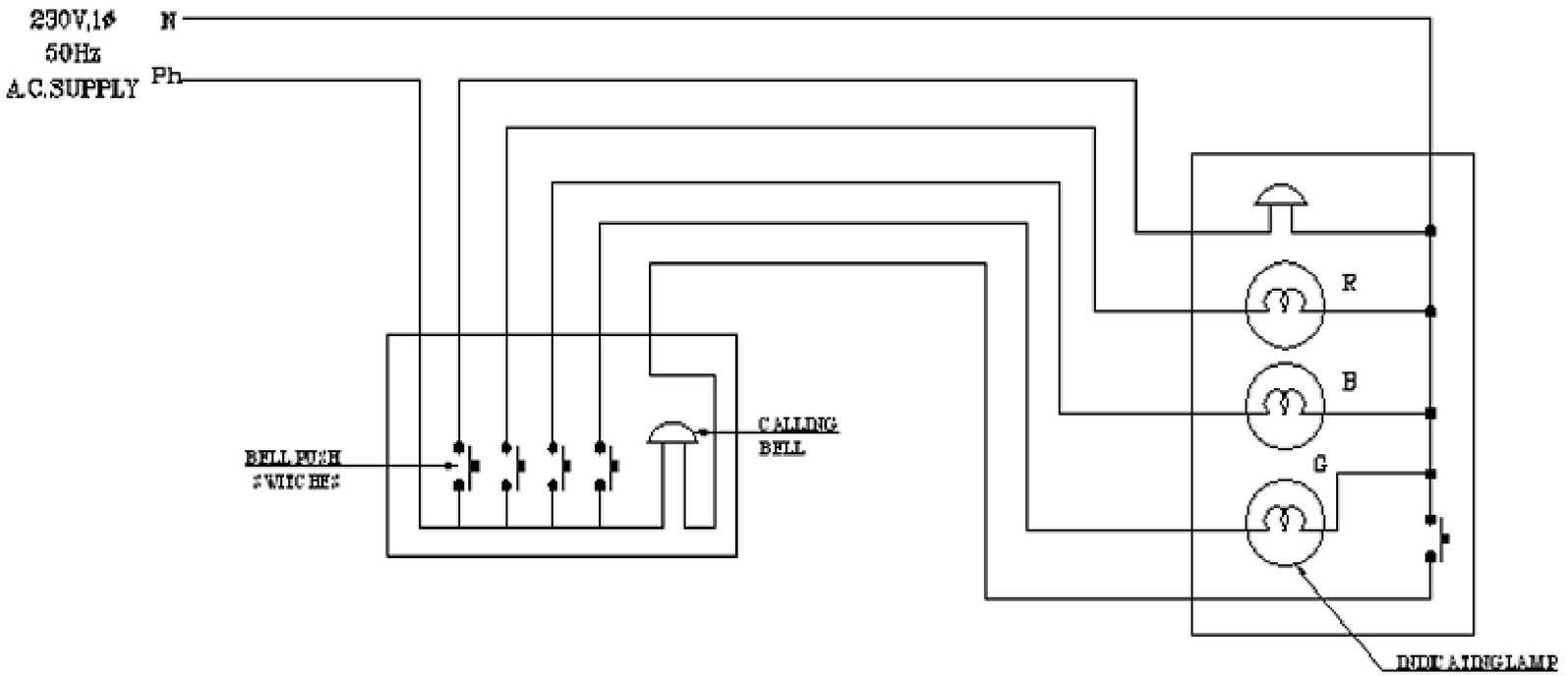
		3-way	1
7.	Switches	Bell push,240V/5A	5
8.	Calling bells		2
9.	Batten holders	Pin type,240V/5A	3
10	Indicating lamps	RED Yellow Blue	1 1 1
11.	PVC insulation tape		

Circuit Diagram:

Layout:



Wiring Diagram:



Procedure:

1. The PVC conduits, gang boxes, junction boxes and batten holder are fixed on the wiring board using saddles and wooden screws as shown in the layout diagram.
2. The 1.5Sqmm PVC wire is laid in conduits as shown in wiring diagram.
3. Switches are fixed and the connections are made as shown in wiring diagram.
4. After checking the circuit, 1-Ø, 230V, 50Hz, supply is given to the circuit.

Experiment No. 8 : FAN WIRING

Aim: To do the Fan wiring.

Tools Required:

S.No	Name of the tool	Size	Qty
1.	Combination plier	15cm	1
2.	Screw Driver	15cm	1
3.	Connector	10cm	1
4.	Hammer	0.5Kg	1
5.	Electrician knife		1
6.	Tester	500V	1
7.	Hacksaw frame	30cm	1

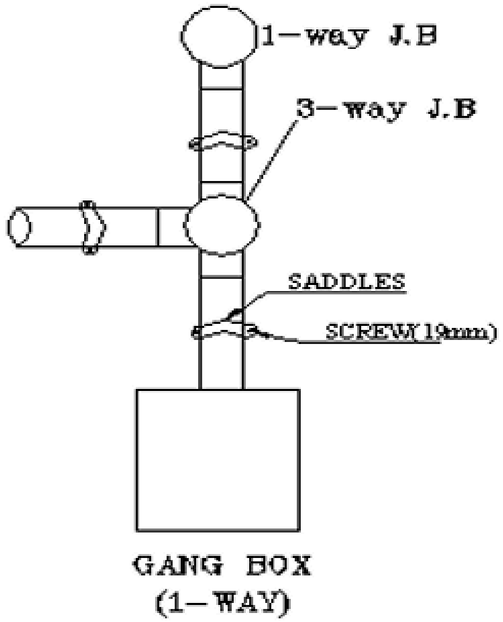
Equipment Required:

S.No	Name of the equipment	Type/Range	Qty
1.	PVC Insulated wire	1.5Sqmm	5Mts(app)
2.	PVC Conduit	19mm	3Mts(app)
3.	Saddles	19mm	3Nos
4.	Wooden screws	19mm 38mm	6Nos 4Nos

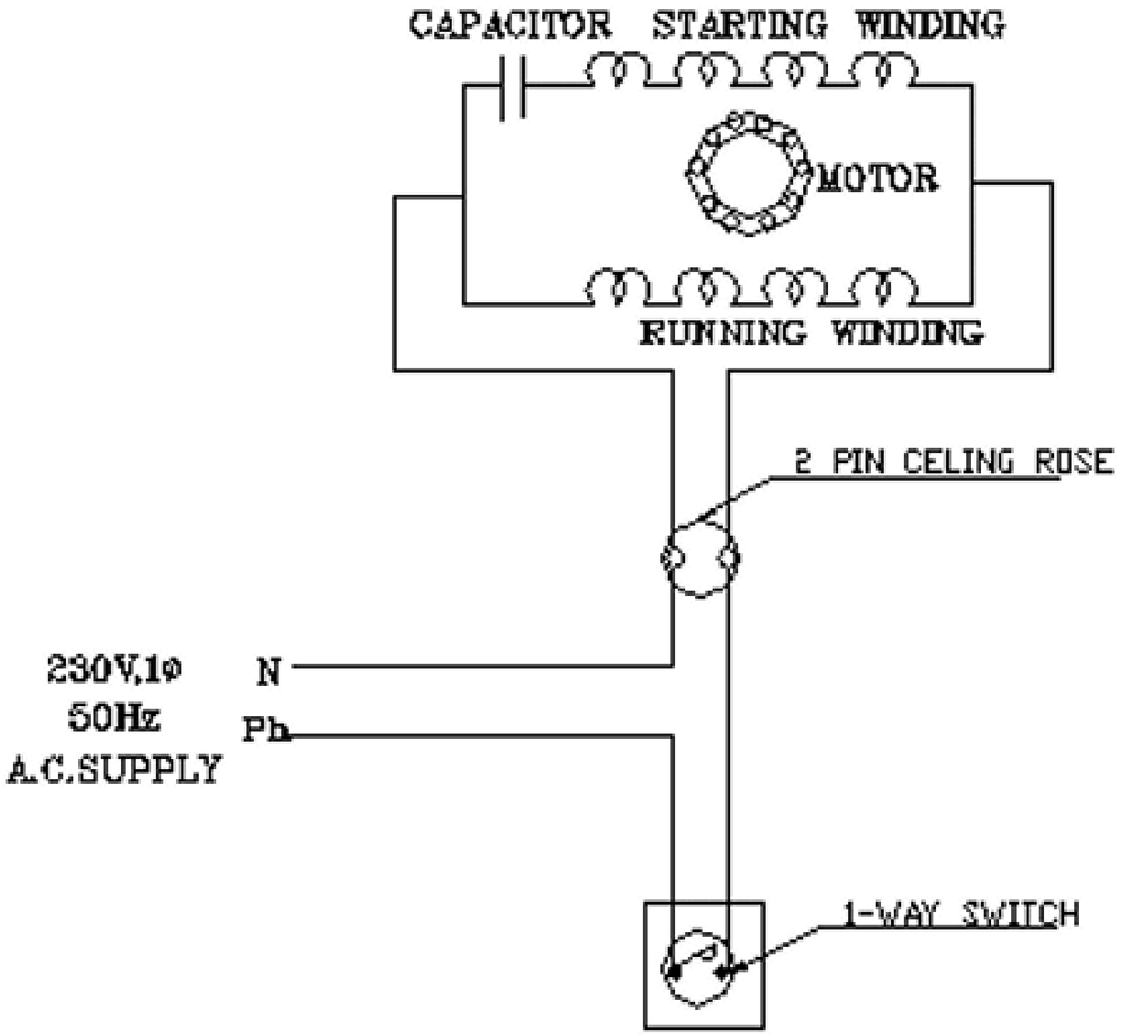
5.	Gang boxes	1-way	1
6.	Junction boxes	1-way 3-way	1 1
7.	Switches	1-way,240V/5A	1
8.	Ceiling rose	2-Pin,240V/5A	1
9.	Ceiling Fan	240V/80W	1
10	Capacitor	240V/2.5µF	1
11.	Tube light(Fluorescent)	Pin type,240V/40W	1
12.	Tube Light Frame with Choke and Starter	240V/40W	1
13.	PVC insulation tape		

Circuit Diagram:

Layout:



Wiring Diagram for fan:



Procedure:

1. The PVC conduits, gang boxes, junction boxes and batten holder are fixed on the wiring board using saddles and wooden screws as shown in the layout diagram.
2. The 1.5Sqmm PVC wire is laid in conduits as shown in wiring diagram.
3. Switches are fixed and the connections are made as shown in wiring diagram.
4. After checking the circuit, 1-Ø, 230V, 50Hz, supply is given to the circuit.
5. Working of the Fan is verified.

Precautions:

5. Make the connections correctly.
6. Make all connections tightly.
7. Check the circuit before giving the supply.
8. Use proper range equipment.

Experiment No. 9 : TUBE LIGHT WIRING

Aim: To do the tube light wiring.

Tools Required:

S.No	Name of the tool	Size	Qty
1.	Combination plier	15cm	1
2.	Screw Driver	15cm	1
3.	Connector	10cm	1
4.	Hammer	0.5Kg	1
5.	Electrician knife		1
6.	Tester	500V	1
7.	Hacksaw frame	30cm	1

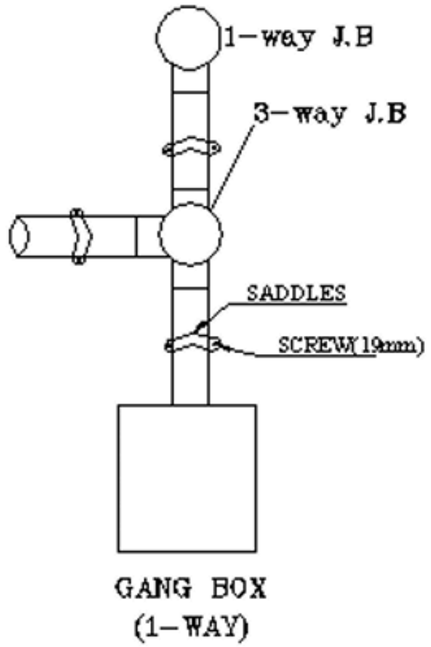
Equipment Required:

S.No	Name of the equipment	Type/Range	Qty
1.	PVC Insulated wire	1.5Sqmm	10Mts(app)

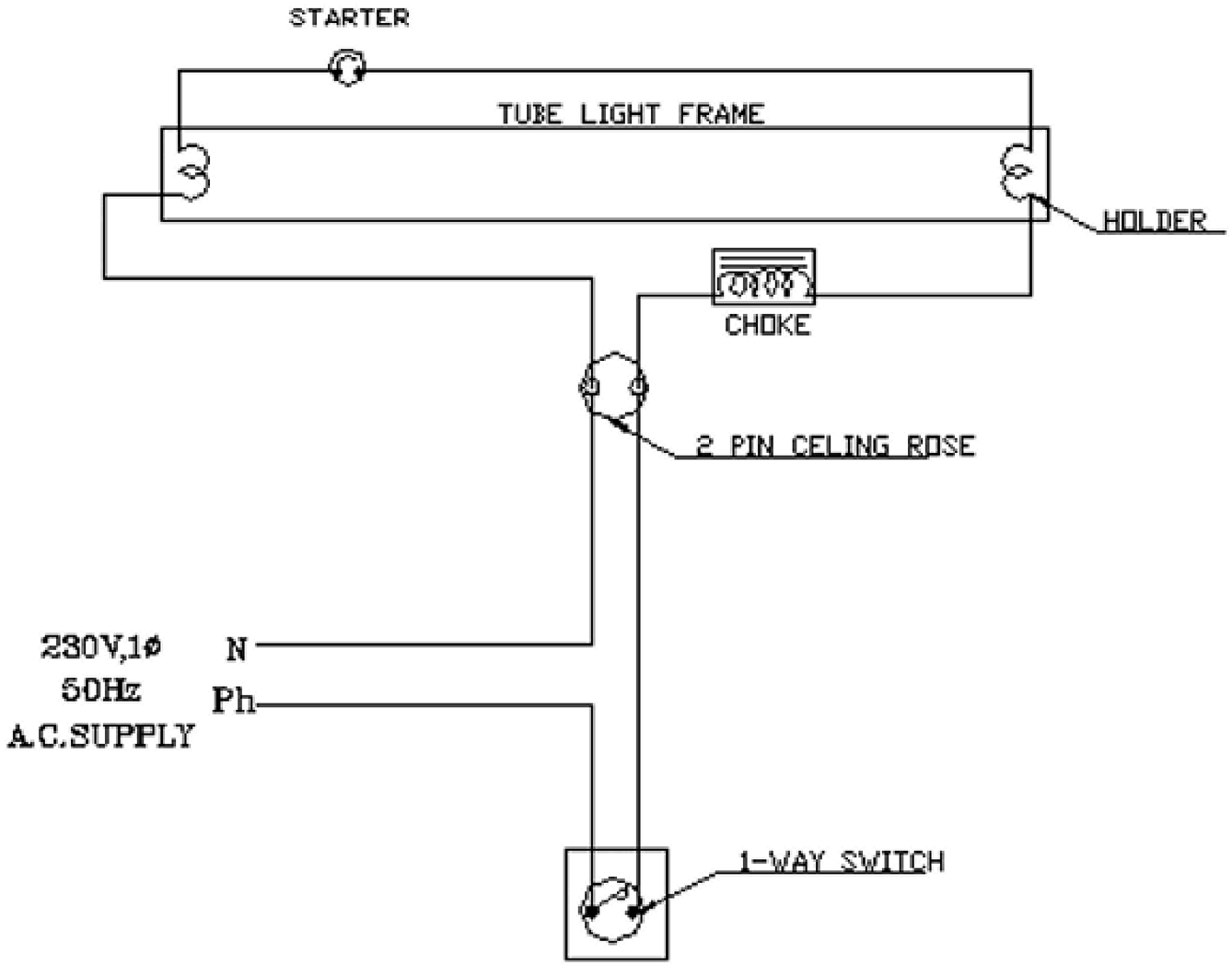
2.	PVC Conduit	19mm	3Mts(app)
3.	Saddles	19mm	6Nos
4.	Wooden screws	19mm 38mm	10Nos 8Nos
5.	Gang boxes	1-way	1
6.	Junction boxes	1-way 3-way	1 1
7.	Switches	2-way,240V/5A	1
8.	Ceiling Rose	2-Pin,240V/5A	1
9.	Tube light set(Frame with holders, starter and choke)	40W,240V	1
10	PVC insulation tape		

Circuit Diagram:

Layout:



Wiring Diagram:



Wiring Diagram:

Procedure:

1. The PVC conduits, gang boxes, junction boxes and batten holder are fixed on the wiring board using saddles and wooden screws as shown in the layout diagram.
2. The 1.5Sqmm PVC wire is laid in conduits as shown in wiring diagram.
3. Switches are fixed and the connections are made as shown in wiring diagram.
4. After checking the circuit, 1-Ø, 230V, 50Hz, supply is given to the circuit.
5. Working of the Tube light is verified.

Precautions:

1. Make the connections correctly.
2. Make all connections tightly.
3. Check the circuit before giving the supply.
4. Use proper range equipment.

Experiment No. 10 : VOLT AMMETER METHOD

AIM: To measure the unknown resistance. Experimentally by volt – ammeter method.

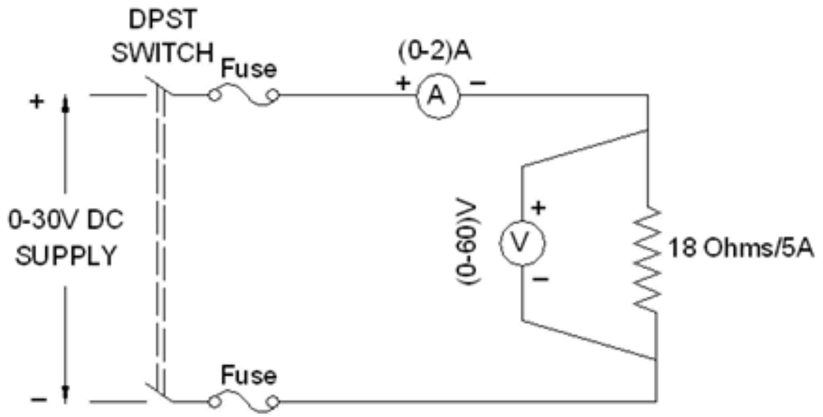
APPARATUS:

S.No	Meter	Type	Range		Qty
1	Voltmeter	MC			1
2	Ammeter	MC	0-2A		1
4	Rheostats	WW	R1	250Ω/2.8 A	1
5	Rheostats	WW	R1	18Ω/5A	1
6	Fuse wire	TCC			10C ms

Theory: As per ohm's laws, when the temperature is constant, voltage drop across resistance directly proportional to the current passing through it. Therefore the plot drawn between different values of current 'I_r' and corresponding voltages 'V_r" will be a straight line.

The slope of the line gives the value of unknown resistance.

CIRCUIT DIAGRAM:



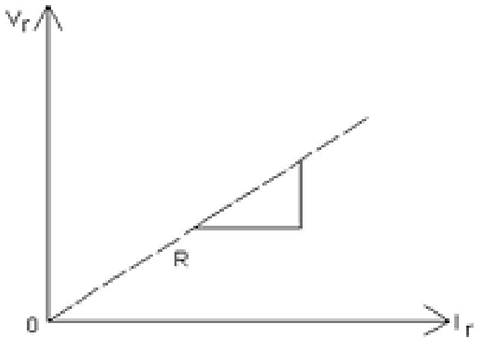
Procedure:

1. Connections are made as per the circuit diagram.
2. By varying 250Ω resistor in steps, the values of the current 'I_r' are noted.
3. The voltages 'V_r' corresponding to values of current 'I_r' are noted.
4. Resistance R= 'V_r'/'I_r' is calculated for all values of 'I_r' and 'V_r.'
5. A graph plotted for different values of current 'I_r' and corresponding voltages 'V_r' to find the value of unknown resistance.

Observations:

S.No	'I_r' Amps	'V_r' Volts	'R_r'

Graph:



PRECAUTIONS:

1. All readings must be taken without parallax error.
2. All connections must be tight.
3. Power should be switched off before making or breaking connections.
4. All meters should be kept horizontally.

THANK YOU