TAMILNADU GOVERNMENT POLYTECHNIC COLLEGE, (AUTONOMOUS), MADURAI- 11

DIPLOMA IN ENGINEERING / TECHNOLOGY SYLLABUS

DIPLOMA IN ELECTRICAL AND ELECTRONICS ENGINEERING

N - 20-SCHEME

(Implemented from the Academic year 2021-2022 onwards)

III SEMESTER (FULL TIME)

Subject Code	SUBJECT	HOURS PER WEEK			
		Theory hours	Drawing hours	Practical hours	Total hours
4040310	Electronic Devices and Circuits	5	-	-	5
4030320	Electrical Circuit Theory	6	-	-	6
4030330	Electrical Machines -1	5	-	-	5
4040340	Electronic Devices and Circuits Practical	-	-	4	4
4030350	Electrical Circuits and Machines Practical	-	-	4	4
4030360	Electrical Workshop Practical	-	-	4	4
4030370	Wiring & Winding Practical	-	-	4	4
		16	-	16	32
Extra / Co-Curricular activities					
Library		-	-	-	1
Physical Education		-	-	-	2
TOTAL					**35**

TAMILNADU GOVERNMENT POLYTECHNIC COLLEGE, (AUTONOMOUS), MADURAI- 11

DIPLOMA IN ENGINEERING / TECHNOLOGY SYLLABUS

DIPLOMA IN ELECTRICAL AND ELECTRONICS ENGINEERING

N - 20-SCHEME

(Implemented from the Academic year 2021-2022 onwards)

III SEMESTER (PART TIME)

Subject Code	Subject	HOURS PERWEEK			
		Theory	Tutorial/ Drawing	Practical	Total
4040310	Electronic Devices and Circuits	4	-	-	4
4030320	Electrical Circuit Theory	4	-	-	4
40015	Engineering Graphics - I	-	4	-	4
40001	Communication Skill Practical	-	-	3	3
4040340	Electronic Devices and Circuits Practical	-	-	3	3
TOTAL		**8**	**4**	**6**	**18**

III SEMESTER

TAMILNADU GOVERNMENT POLYTECHNIC COLLEGE, (Autonomous), MADURAI- 11

N - 20 SCHEME

DIPLOMA IN ELECTRICAL AND ELECTRONICS ENGINEERING

(Implemented from the Academic Year 2021 – 2022 onwards)

Course Name : All Branches of Diploma in Engineering and Technology

Subject Code : 4040310

Semester : III Semester

Subject title : ELECTRONIC DEVICES AND CIRCUITS

TEACHING AND SCHEME OF EXAMINATION

No of weeks/ semester: 16weeks

Subject	Instruction		Examination			
	Hours /Week	Hours /Semester	Marks			Duration
			Internal Assessment	End Semester Examination	Total	
ELECTRONIC DEVICES AND CIRCUITS	**5**	**80**	**25**	**100***	**100**	**3 Hrs**

*** Examination will be conducted for 100 marks and it will be reduced to 75 marks.**

TOPICS AND ALLOCATION OF HOURS

UNIT	TOPIC	Hrs
I	Filters, Zener diode and Opto-electronic devices	14
II	Bipolar Junction Transistor, Field Effect Transistor and UJT	16
III	Feedback, Amplifiers and Oscillators	16
IV	Special Semiconducting Devices (SCR, DIAC AND TRIAC)	14
V	Wave shaping Circuits	13
	Tests and Model Exam	7
Total		80

DETAILED SYLLABUS

Contents: Theory

Unit	Name of the topics	Hours
I	**FILTERS, ZENER DIODES AND OPTO-ELECTRONIC DEVICES** **1.1: FILTERS** Definition - Types - Capacitor filter - Inductor filter - L section filter - Pi section and RC filter - Comparison and Applications of Filters **1.2: ZENER DIODE** Construction, Working principle and Characteristics of Zener Diodes- Zener Breakdown-Avalanche breakdown- Zener diode as a Voltage regulator.	**5** **5**
II	**BIPOLAR JUNCTION TRANSISTOR (BJT), FIELD EFFECT TRANSISTOR (FET) AND UNI JUNCTION TRANSISTOR (UJT)** **: BIPOLAR JUNCTION TRANSISTOR** Transistor biasing: Need for biasing - Types- Fixed bias, Collector to base bias and Self bias (Operation only, no derivation of circuit elements and parameters)- Define: Stability factor - Operation of Common Emitter Transistor as an Amplifier and as a switch. : **FIELD EFFECT TRANSISTOR (FET)** Construction – Working principle-Classification - Drain and Transfer Characteristics -Applications-Comparison between FET and BJT - FET amplifier (common source amplifier). **: UNIJUNCTION TRANSISTOR (UJT)** C onstruction- Equivalent Circuit-Operation-Characteristics- UJT as a relaxation oscillator.	**7** **5** **4**
III	**FEEDBACK, AMPLIFIERS AND OSCILLATORS** **3.1: FEEDBACK** Concept - effects of negative feedback-Types of negative feedback connections - Applications **3.2: AMPLIFIERS** Transistor amplifiers - Types - RC coupled amplifier - Working and Frequency response characteristics -Working of Common Collector Amplifier (Emitter follower) **3.3: OSCILLATORS** **Transistor oscillators**-Conditions for oscillation (Barkhausen criterion)-Classifications- Hartley Oscillator- Colpitts Oscillator – RC Phase Shift oscillator.	**6** **6** **4**

IV	**SPECIAL SEMICONDUCTING DEVICES (SCR, DIAC AND TRIAC)** **4.1:SCR (SILICON CONTROLLED RECTIFIER)** Symbol – Layered Structure – Transistor analogy - Working-VI characteristics- Applications - Comparison between SCR and Transistor **: DIAC (Diode for Alternating Current)** Symbol – Layered structure - Working – VI characteristics- Applications **: TRIAC (Triode for Alternating Current)** Symbol – Layered structure - Working – VI characteristics- Applications	**5** **5** **4**
V	**WAVE SHAPING CIRCUITS** **5.1: CLIPPERSAND CLAMPERS** Construction and working of Positive, Negative and biased Clippers - Construction and working of Positive and Negative Clamper **5.2: Voltage Multipliers** Construction and working of Voltage Doubler and Tripler. **5.3: Multivibrator and Schmitt Trigger** Construction – Working – Waveform of Astable and Monostable Multivibrator using Transistors and Schmitt Trigger using Transistors.	**5** **3** **5**

TAMILNADU GOVERNMENT POLYTECHNIC COLLEGE, (Autonomous), MADURAI- 11

N - 20 SCHEME

DIPLOMA IN ELECTRICAL AND ELECTRONICS ENGINEERING

(Implemented from the Academic Year 2021 – 2022 onwards)

Course Name : Diploma in Electrical and Electronics Engineering

Subject Code : 4030320

Semester : III

Subject Title : ELECTRICAL CIRCUIT THEORY

TEACHING AND SCHEME OF EXAMINATION

No of weeks per Semester: 16 weeks

Subject	Instructions		Examination			
	Hours / Week	Hours / Semester	Marks			Duration
			Internal Assessment	End Semester Examinations	Total	
ELECTRICAL CIRCUIT THEORY	**6**	**96**	**25**	**100***	**100**	**3 Hrs.**

*** Examinations will be conducted for 100 Marks, and it will be reduced to 75 Marks.**

Topics and Allocation of Hours

UNIT	Topic	Hrs.
I	DC Circuits	18
II	Circuit Theorems	18
III	Single Phase Circuits	18
IV	Three phase Circuits	18
V	Storage Batteries	17
Test & Model Exam		7
Total		96

DETAILED SYLLABUS

Contents: Theory

Unit	Name of the Topics	Hours
I	**DC CIRCUITS** Basic Concepts of Current, EMF, Potential Difference, Resistance and Resistivity- Ohm‟s Law -Work, Power, Energy- Resistance in Series, Parallel and Series - Parallel Circuits – Kirchhoff‟s Laws – Concept of Capacitance - Capacitors in Series and in Parallel - Problems in the above Topics.	18
II	**CIRCUIT THEOREMS** Definitions of Node, Branch and Network – Mesh Equations-Nodal Equations-Star / Delta Transformations – Superposition Theorem – Thevenin‟s Theorem –Norton‟s Theorem – Maximum Power Transfer Theorem. (Problems in DC Circuits only)	18
III	**SINGLE PHASE CIRCUITS** Definitions of Sinusoidal Voltage and Current- Instantaneous, Peak, Average and Effective Values – Form Factor and Peak Factor (Derivation for Sine Wave) – Pure Resistive, Inductive and Capacitive Circuits -RL, RC, RLC Series Circuits – Impedance – Phase Angle – Use of „J‟ Notations-Rectangular and Polar Coordinates - Phasor Diagram Power and Power Factor – Power Triangle – Apparent Power, Active and Reactive Power- Parallel Circuits (Two Branches Only)- Conductance, Susceptance and Admittance-Problems in all above topics. **RESONANCE** Concept of Series Resonance – Parallel Resonance (R, L & C)- Applications (No Problems)	10 8

IV	**THREE PHASE AC CIRCUITS** Three Phase AC Systems-Phase Sequence -Necessity of Three Phase System-Concept of Balanced and Unbalanced Load - Balanced Star & Delta Connected Loads-Relation between Line andPhase Voltages and Currents – Phasor Diagram Three Phase Power – Power Factor – Three Phase Power and Power Factor Measurement by Single Wattmeter and Two Wattmeter Methods–Problems in all Topics.	8 10
V	**STORAGE BATTERIES** Classification of cells – Construction, Chemical action and physical changes during charging and discharging of Lead Acid, Nickel Iron and Nickel Cadmium Cells – Advantages and Disadvantages of Nickel Ion and Nickel Cadmium Cells over Lead Acid Cell - indication of fully charged and discharged battery – defects and their remedies – capacity - AH efficiency and WH efficiency (no problems) – methods of charging - care and maintenance – applications – maintenance free batteries – Lithium Cells, Lithium - Ion Cells and Mercury Cells – Concept of Recharged Cell.	17

TAMILNADU GOVERNMENT POLYTECHNIC COLLEGE, (Autonomous), MADURAI- 11

N - 20 SCHEME

DIPLOMA IN ELECTRICAL AND ELECTRONICS ENGINEERING

(Implemented from the Academic Year 2021 – 2022 onwards)

Course Name : Diploma in Electrical and Electronics Engineering

Subject Code : 4030330

Semester : III Semester

Subject Title : ELECTRICAL MACHINES-I

TEACHING AND SCHEME OF EXAMINATION

No of weeks per semester: 16 weeks

Subject	Instructions		Examination			
	Hours / Week	Hours / Semester	Marks			Duration
			Internal Assessment	End Semester Examinations	Total	
ELECTRICAL MACHINES-I	5	80	25	100*	100	3 Hrs.

*** Examinations will be conducted for 100 marks, and it will be reduced to 75 marks.**

Topics and Allocation of Hours

UNIT	Topic	Hrs.
I	DC Generators	15
II	DC Motors	15
III	Single Phase Transformer	15
IV	Three Phase Transformer	15
V	Maintenance of DC Machines and Transformers	13
Test & Model Exam		07
Total		**80**

DETAILED SYLLABUS

Contents: Theory

Unit	Name of the Topics	Hours
I	**DC GENERATORS** Review of electromagnetic induction – Faraday‟s laws –Lenz‟s law - Fleming‟s right hand rule – Principle of operation of D.C. generator – Construction of D.C. generator – Types of armature windings(No Winding diagram) – EMF equation(Simple problems) –Types of D.C. generators – No load and load characteristics of DC generators – Causes of failure to build-up voltage and remedy – armature reaction – methods of compensating armature reaction – process of commutation – methods of improving commutation. Load characteristics of DC generators – Applications of DC generators	15
II	**DC MOTORS** Principle of operation of D.C. Motor – Fleming‟s left-hand rule – Construction Back emf – Torque equation – Types of DC motors –Torque-current, Speed-current, Speed- Torque characteristics of different DC motors – Speed control of DC motors– Field control and armature control – necessity of Starters– 3 Point and 4 Point starters –losses in D.C. Machines – Testing of D.C. Machines – Predetermination of efficiency of motor and generator by Swinburne‟s test – Problems in the above topics – Applications of D.C. Motors.	15
III	**SINGLE PHASE TRANSFORMER** Principle of operation – Constructional details of core and shell type Transformers – EMF Equation – Voltage ratio –Transformer on No load – Transformer Full load – Current ratio – Phasor diagram on no load and Full load at different power factors. O.C. test, S.C. test –Determination of equivalent circuit constants– Determination of voltage regulation and efficiency – Condition for maximum efficiency– All day efficiency – Problems on the above topics - polarity test–Parallel operation of Single Phase transformers– Auto transformer –principle – Applications of	15

	transformers – Energy Efficient Transformer – Dry Type Transformer & Amorphous Core Transformer.	
IV	**THREE PHASE TRANSFORMER** Three phase Transformer – construction, types of connections of transformer. Parallel operation of three phase transformers – grouping of transformers – Pairing of transformers - Load sharing of transformers with equal and unequal ratings –Cooling of transformers – Various cooling arrangements – Transformer accessories – conservator, breather, explosion vent, bucholz relay – ON load and OFF load tap changer.	15
V	**MAINTENANCE OF DC MACHINES AND TRANSFORMERS** Maintenance – Importance, Preventive and Breakdown maintenance - Advantages of preventive maintenance - Causes of Sparking in Commutators – Defects in Commutators and Remedies – Resurfacing of Commutators and Brushes – Maintenance of Brush Holder – Staggering of Brushes, Brush Pressure - Defects in DC Armature winding – Maintenance of Earthing of DC Machines. Maintenance of Transformer Oil - Transformer oil tester – Acidity test, BDV Test - Earthing – Measurement of earth resistance.	13

TAMILNADU GOVERNMENT POLYTECHNIC COLLEGE, (Autonomous), MADURAI- 11

N - 20 SCHEME

DIPLOMA IN ELECTRICAL AND ELECTRONICS ENGINEERING

(Implemented from the Academic Year 2021 – 2022 onwards)

Course Name : All Branches of Diploma in Engineering and Technology

Subject code 4040340

Semester III

Subject title : ELECTRONIC DEVICES AND CIRCUITS PRACTICAL

TEACHING AND SCHEME OF EXAMINATION

No. of weeks/ Semester: 16weeks

Subject	Instruction		Examination			
			Marks			Duration
	Hours /week	Hours /semester	Internal Assessment	End Semester Examination	Total	
ELECTRONIC DEVICES AND CIRCUITS PRACTICAL	**4**	**64**	**25**	**100***	**100**	**3 Hours**

***Examination will be conducted for 100 marks and it will be reduced to 75 marks.**

RATIONALE:

Every Electronics Engineer should have sound knowledge about the components used in Electronics Industry. This is vital in R&D Department for chip level troubleshooting. To meet the industrial needs, diploma holders must be taught about the most fundamental subject, electronic devices and Circuits Practical. By doing practical experiments in this, they will be skilled in handling all types of electronic circuits and able to apply the skill in electronic systems.

OBJECTIVES:

On completion of the following experiments, the students must be able to

- Know the Cold Checking of Active and Passive Component
- Find out the Unknown Resistance value of a Resistor using Colour Coding

- Find out the Unknown Capacitance value of a Capacitor using Colour Coding
- Find out the Unknown Inductance value of an Inductor using Colour Coding
- Understand the concept, working principle and applications of PN Junction diode
- Understand the concept, working principle and applications of Zener diode
- Understand the concept, working principle and applications of BJT and FET
- Understand the concept, working principle and applications of UJT
- Understand the concept, working principle and applications of SCR
- Understand the concept, working principle and applications of DIAC and TRIAC
- Understand the concept, working principle and applications of Clippers and Clampers
- Understand the concept, working principle and applications of various types of Negativefeedback amplifiers
- Understand the concept, working principle and applications of Astable Multivibrator.

DETAILED SYLLABUS

Contents: Practical

Exercises

Note: At least 5 experiments should be done using Soldering board / Bread board

1. Construct a circuit to test the forward and reverse bias characteristics of a PN Junction Silicondiode. Find the value of its cut-in voltage
2. Construct a circuit to test the forward and reverse bias characteristics of a Zener diode. Find thevalue of its reverse breakdown voltage
3. Construct a Full wave (center tapped) rectifier and test its input and output waveforms with andwithout Capacitor filter. Find its maximum voltage.
4. Construct a Full wave (Bridge) rectifier and test its input and output waveforms with and withoutCapacitor filter. Find its maximum voltage.
5. Construct a Common Emitter Transistor circuit and test its input and output characteristic curves.
6. Construct a Common Source Field Effect Transistor circuit and test its drain and transfer characteristic curves.
7. Construct a circuit to test the Turning on and Turning off characteristics of SCR and find out theforward break over voltage, the value of Latching and Holding currents.
8. Construct a circuit to test the bidirectional characteristics of DIAC and plot its switchingcharacteristics.
9. Construct a circuit to test the bidirectional characteristics of TRIAC and plot its switchingcharacteristics.
10. Construct a Common emitter amplifier circuit and test its frequency response characteristics with and without Current series feedback introduced in it.
11. Construct a circuit to test the switching characteristics of Astable Multivibrator.
12. Construct a circuit to test the negative resistance Characteristics of UJT.

TAMILNADU GOVERNMENT POLYTECHNIC COLLEGE, (Autonomous), MADURAI- 11

N - 20 SCHEME

DIPLOMA IN ELECTRICAL AND ELECTRONICS ENGINEERING

(Implemented from the Academic Year 2021 – 2022 onwards)

Course Name : Diploma in Electrical and Electronics EngineeringSubject

Code : 4030350

Semester : III Semester

Subject Title : ELECTRICAL CIRCUITS AND MACHINES PRACTICAL

TEACHING AND SCHEME OF EXAMINATION

No of weeks per semester: 16 weeks

Subject	Instructions		Examination			
	Hours / Week	Hours / Semester	Marks			Duration
			Internal Assessment	End Semester Examinations	Total	
ELECTRICAL CIRCUITS AND MACHINES PRACTICAL	4	64	25	100*	100	3 Hrs.

*** Examinations will be conducted for 100 marks, and it will be reduced to 75 marks.**

RATIONALE:

- To impart Practical Knowledge to the Diploma Students and Practical Subjects are introducedfor every corresponding Theory Subject.
- This Practical Course supports the aim and objective of Electrical Machines- I and ElectricalCircuit Theory Subjects.

OBJECTIVES

On completion of this Practical Subject, the Students will be able to:

- Make the various Circuit connections in Machines Laboratory.
- Practically prove all the Theorems and Principles which are dealing with DC Current.
- Understand the Characteristics of Electrical Machines and to determine the Efficiency of theMachines

- Test the performance of Transformer to find its Efficiency, Voltage Regulation andCharacteristics.
- Study the various Speed Control Methods of DC Motor.

DETAILED SYLLABUS

ELECTRICAL CIRCUITS AND MACHINES PRACTICAL

LIST OF EXPERIMENTS:

CIRCUITS:

1. Verification of Super Position Theorem with two different DC Voltages for a common load.
2. Verification of Thevenin‟s Theorem with DC Supply
3. Measurement of Power

a. using Ammeter and Voltmeter

b. using Wattmeter for Single Phase Resistive Load.

MACHINES:

4. No load and FULL Load Characteristics of Self Excited DC Shunt Generator.
5. Load Characteristics of Self Excited DC Series Generator.
6. Load Test on DC Shunt Motor and Draw the Performance Curve.
7. Load Test on DC Series Motor and Draw the Performance Curve.
8. Predetermine the Efficiency of DC Machines by Swinburne‟s Test.
9. Speed Control of DC Shunt Motor by

a. Armature Control Method

b. Field Control Method

10. Load Test on Single Phase Transformer
11. Load Test on Three Phase Transformer
12. Predetermine the Efficiency and Regulation of Single-Phase Transformer by conducting O.Cand S.C Tests
13. Find the Equivalent Circuit Constants of Single-Phase Transformer by conducting O.C and S.CTests.
14. Connect two Single Phase Transformers for Parallel Operation.
15. a) Perform Breakdown Test And determine the Dielectric Strength of Transformer Oil.

    b) Conduct Acidity Test on Transformer Oil.

TAMILNADU GOVERNMENT POLYTECHNIC COLLEGE, (Autonomous), MADURAI- 11

N - 20 SCHEME

DIPLOMA IN ELECTRICAL AND ELECTRONICS ENGINEERING

(Implemented from the Academic Year 2021 – 2022 onwards)

Course Name : Diploma in Electrical and Electronics EngineeringSubject

Code : 4030360

Semester : III Semester

Subject Title : ELECTRICAL WORKSHOP PRACTICAL

TEACHING AND SCHEME OF EXAMINATION

No of weeks per Semester: 16 weeks

Subject	Instructions		Examination			
	Hours / Week	Hours / Semester	Marks			Duration
			Internal Assessment	End Semester Examination	Total	
ELECTRICAL WORKSHOP PRACTICAL	4	64	25	100*	100	3 Hrs.

Examinations will be conducted for 100 marks, and it will be reduced to 75 Marks.

RATIONALE

- To impart practical knowledge to the Diploma Students for servicing of Domestic Appliances.
- This Subject is assigned to develop Skill on Assembling and test the HouseholdElectrical Appliances.

OBJECTIVES

At the end of the practical the students will be able to:

- ✓ Identify and use the tools used in servicing of Electrical Appliances.
- ✓ Assemble the various parts of Domestic Appliances.

- ✓ Make the Electrical Connections and test their performance.

DETAILED SYLLABUS

LIST OF EXPERIMENTS:

1. Familiarization of tools used for Electrical repair works and personal Protection Equipments.
2. Dismantling of Electrical Iron Box, identifying the parts, checking theconditions, assembling, and testing.
3. Dismantling of Mixer Grinder, identifying the parts, checking the conditions, assembling and testing.
4. Dismantling of Wet Grinder, identifying the parts, checking the conditions, assembling, and testing.
5. Assembling the accessories of Ceiling Fan, test the connections of winding& Capacitor and run the Fan with Speed Regulator.
6. Connect the Battery and Inverter to supply partial load in a Domestic Wiringduring Mains Failure.
7. Assembling and testing of 15watts LED Light.
8. Battery Charging through Solar Panel. Connect Solar Panel to charge Battery through Charge Controller.
9. Dismantling of Induction Heater, identifying the parts, checking the conditions, assembling, and testing.
10. Dismantling of Microwave Oven, identifying the parts, checking the conditions, assembling and testing.

TAMILNADU GOVERNMENT POLYTECHNIC COLLEGE, (Autonomous), MADURAI- 11

N - 20 SCHEME

DIPLOMA IN ELECTRICAL AND ELECTRONICS ENGINEERING

(Implemented from the Academic Year 2021 – 2022 onwards)

Course Name : Diploma in Electrical and Electronics EngineeringSubject

Code : 4030370

Semester : III Semester

Subject Title : WIRING & WINDING PRACTICAL

TEACHING AND SCHEME OF EXAMINATION

No of weeks per Semester: 16 weeks

Subject	Instructions		Examination			
	Hours / Week	Hours / Semester	Marks			Duration
			Internal Assessment	End Semester Examinations	Total	
WIRING & WINDING PRACTICAL	4	64	25	100*	100	3 Hrs.

* **Examinations will be conducted for 100 marks, and it will be reduced to 75 marks.**

RATIONALE

To provide concept and hands on experience in Electrical Wiring and Winding including different Wiring Systems, Installation Methods and Basic Winding Preparation. Each topic in the syllabus serves as guide for students to deal with the process of connecting various accessories for the distribution of Electrical Energy from the Meter Board.

OBJECTIVES

At the end of this Practical Course the Students should be able to:

- Execute the Emergency Alarm Circuit
- Execute the wiring for Single Phase Service Connection with necessary items.
- Execute the wiring of Three Phase Supply using 3 Rotary Switches, MCB and DB tochange the Phases by connecting Single Phase Lamp Load
- Execute the wiring to controlling the intensity of Lamp by six places by using two 2-Way Switches and 4 Intermediate Switches.
- Execute the wiring to connect a Single- Phase Motor with Main Switch, D.O.L Starterand M.C.B
- Execute The Wiring to Connect A 3 Phase Induction Motor with Main Switch, Star / Delta Starter and E.L.C.B.
- Execute the wiring to control lamps (Sodium Vapor Lamp, Mercury Vapor Lamp, Fluorescent Lamp)
- Execute the wiring for Test Board with necessary items.
- Execute the Go down /Tunnel wiring
- Prepare winding for Transformer and No Volt Coil.
- Give end connections for 3 Phase Induction Motor Winding.
- Testing of faulty Ceiling Fan.

DETAILED SYLLABUS

Contents: Practical

Name of the Topics:

WIRING

1. Emergency alarm wiring with 3 Bells and 3 Pushbuttons.
2. House Wiring for a Service Connection with Single Phase Digital Energy Meter Cutout, Main Switch, 4 Way D.B, Indicator Lamp.
3. Wiring and Testing of 3 Phase Supply using 3 Rotary Switches, MCB and DB to change the Phases by connecting Single Phase Lamp Load.
4. Controlling a Lamp by Six Places by using Two, 2-Way Switches& Four Intermediate Switches.
5. Wiring of Single-Phase Motor using Single Phase Main Switch, D.O.L Starter and MCB.
6. Wiring of Three Phase Induction Motor with Main Switch,Star/Delta Starter and ELCB.
7. Wiring of Sodium Vapor and Mercury Vapor Lamp.
8. Wiring and troubleshooting the Fluorescent Tube light.
9. Design and implement a Test Board with Indicator Lamp,Fuse Unit to Test Electrical Appliances.
10. Go down / Tunnel wiring using 4 Lamps.

WINDING

1. Design, construct and test a 230/12-0-12 Volt, 500mA Transformer.
2. Design No Volt Coil for a 230/440 AC Contactor.
3. Demonstrate the end connection for a 3 Phase InductionMotor Winding for a 2 Poles / 4Pole Operations.
4. Dismantling a faulty Ceiling Fan and identify the fault, run thefan after rectifying the fault.