



GOVERNMENT OF TAMILNADU  
DIRECTORATE OF TECHNICAL EDUCATION, CHENNAI-25

**STATE PROJECT COORDINATION UNIT**

*(Established under Canada India Institutional Cooperation Project)*

**CURRICULUM**

Course Name	<b>MOTOR REWINDING</b>
Course Code	<b>EE/2020/005</b>
Course Duration	60 Hours
Minimum Eligibility Criteria	10 <sup>th</sup> /+2 /ITI/Diploma/Graduates
Pre-requisites (if any)	-
Course Objectives	<p>Training module has been designed for the participants to</p> <ul style="list-style-type: none"> <li>Understand the Types of Conductors, insulators and vanishing methods.</li> <li>Practice in Winding preparation, checking of wire gauge, and preparation of winding coil.</li> <li>Handle winding wires and tools during rewinding works.</li> <li>Testing of insulation, single and three phase motor testing and fault finding</li> </ul>
Course Outcomes	<p>At the end of training, the trainees will be able to</p> <ul style="list-style-type: none"> <li>Explain the types of insulating materials used for Motor winding works.</li> <li>List the materials and tools required for Motor Rewinding works</li> <li>Complete rewinding of Electric Motors and Low Voltage Transformers</li> <li>Complete End connection of three phase induction motor winding.</li> <li>Identify the fault in Electric Motor and Transformer.</li> </ul>
Expected Job Roles	Motor Winder

**TEACHING AND SCHEME OF EXAMINATION**

Course Code	Course Name	Hours		Assessment Marks		Duration of Examination
				Min	Max	
EE/2020/005	MOTOR REWINDING	Theory	24	10	20	3 Hours
		Practical	36	40	80	
		Total	60	50	100	

# EE/2020/005- MOTOR REWINDING

## DETAILED SYLLABUS

Unit No	Modules	No.of.Hours	
		Theory	Practical
I	Winding Insulating Materials:	10 Hours	
1.1	Introduction, Electrical properties	08	02
1.2	Measure Current, Voltage and Resistance of Single Phase and Three phase load.		
1.3	Identify the phase, neutral and earth in single and three phase supply		
1.4	Verify the characteristics of series, parallel and its combination circuits		
1.5	Types of Insulating Materials and Varnishing Method		
1.6	Stripping of old winding by different methods		
1.7	Types of Winding: Single Layer and Double Layer winding for single phase and Three phase AC Induction Motor		
II	Winding Process:	20 Hours	
2.1	Introduction, Properties and Choice of conductor material	06	14
2.2	Inserting coil in the Slot		
2.3	Carryout insulating paper and wooden/insulating stick as per the slot of the motor		
2.4	Prepare the winding coil as per size, no. of turns and coil pitch		
2.5	Insert the coil and mark start/end point , connect the coil		
2.6	Test the continuity and winding insulation, Assemble the motor and run.		
2.7	Test and identify the fault in coil of transformer		
2.8	Practical:Dismantle the core and coil, Rewind the faulty coil		
2.9	Practical:Reassemble the coils, Test for continuity of transformer		
III	Practical :	30 Hours	
3.1	Design, construct and test a 230/12-0-12 volt, 500mA transformer	10	20
3.2	Design no volt coil for a 230/440 AC contactor		
3.3	Dismantling a fault ceiling fan and identify the fault, run the fan after rectifying the fault		
3.4	Demonstrate the end connection for a 3 phase induction motor winding for a 2 poles / 4 poles operations		
3.5	Identify the armature winding		
3.6	Identify the stator poles		
3.7	Measurement of the winding resistance for universal motors		
Total Theory and Practical Hours		24	36
Total hours		60	

### HARDWARE REQUIREMENT

S.NO	LIST OF TOOLS /EQUIPMENTS
1	Electrical Tools Set
2	SWG, Sander, Blower and Multimeter
3	Winding Wire – Different Sizes
4	Stator and Rotor
5	Bobbin
6	Winding Machines

### SOFTWARE REQUIREMENT

NIL
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### REFERENCE BOOKS

S.NO	NAME OF THE BOOK	AUTHOR	PUBLISHER
1	Rewinding Small Motors	Karl Wilkinson	Elsevier.
2	Energy Efficiency in Motor Driven Systems	Francesco Parasiliti, Paolo Bertoldi	Springer Science & Business Media
3	Armature Winding And Motor Repair	Daniel H. Braymer	Springer

## ASSESSMENT AND CERTIFICATION

S.No	Criteria for assessment
1.	A trainee will be assessed based on the performance in End Examination for Theory and Practical conducted internally in the CIICP Project Polytechnic College for a duration of 3 hours
2.	A trainee must have 75% of attendance to appear for End examination in Theory and Practical.
3.	The assessment for theory part will be based on the marks scored in the end examination on the knowledge bank of questions (1 word/objective type questions)
4.	The assessment for practical part will be based on the marks scored in the end examination conducted by the CIICP Project Polytechnic and assessed by the Examiners approved by Strategic Plan Implementation Committee (SPIC) of the project polytechnic.
5.	The passing criteria for successful completion of training is every trainee should score 50% of marks in theory and practical examination.
6.	On successful completion of training, Certificate will be issued to the participants by the Directorate of Technical Education through the Project Polytechnics.

## END EXAMINATION

### ALLOCATION OF MARKS

S.NO	Description	Max. Marks
1.	Theory Examination	20
2.	Practical Examination	
	a)Objective and Circuit Diagram	20
	b)Procedure and Connections / Execution	20
	c)Result and Viva	20
	d) Record	20
<b>Total Marks</b>		<b>100</b>

## **THEORY MODEL QUESTION PAPER**

### **EE/2020/005 MOTOR REWINDING**

**(Maximum Marks: 20)**

**(N.B: Answer any Twenty questions)**

**20x1= 20 Marks**

1. Define power.
2. What is unit of current?
3. What are the types of electrical properties of engineering material?
4. How to identify the phase, neutral and earth in three phase supply?
5. What is series circuit?
6. What is parallel circuit?
7. What is combination circuit?
8. What are the different types of insulation classes?
9. What are the types of varnishing method?
10. What is single layer winding?
11. What is double layer winding?
12. What are the properties of conducting material?
13. Write short notes on winding insulation.
14. Write short notes on coil insertion.
15. How to carryout insulation paper?
16. Define coil pitch.
17. How to insert the coil?
18. What is continuity test?
19. What is the purpose insulation resistance test?
20. How to identify the fault in transformer?
21. Major causes of fault in the transformer.
22. What type of motor used in ceiling fan?
23. How many no. of winding used in ceiling fan?
24. How to rectify the mechanical noisy in ceiling fan?
25. What is universal motor?