GOVERNMENT OF TAMILNADU

DIRECTORATE OF TECHNICAL EDUCATION, CHENNAI-25

STATE PROJECT COORDINATION UNIT

(Established under Canada India Institutional Cooperation Project)

CURRICULUM

Course Name	**AUTO ELECTRICAL TECHNICIAN**
Course Code	**EE/2020/013**
Course Duration	50 Hours
Minimum Eligibility Criteria	10th/+2 /ITI/Diploma/Graduates
Pre-requisites (if any)	-
Course Objectives	Training module has been designed to provide the participants • Understandthe basic concept of auto electrical. • Understand the basic electrical systems, batteries, starting systems, charging system. • Understand the ignition system, lighting, instrumentation, warning systems and accessory systems. • Troubleshooting procedure of Electrical issues in Automobile.
Course Outcomes	At the end of training, the trainees will be able to • Use different type of fastening and locking devices in a vehicle. • Construct electrical circuit and test its parameters by using electrical measuring instruments. • Perform troubleshooting of electrical fault in starting, ignition and lighting system. • Perform basic electrical testing in a vehicle. • Perform battery testing and charging operations.
Expected Job Roles	Auto Electrical Technician

TEACHING AND SCHEME OF EXAMINATION						
Course Code	Course Name	Hours		Assessment Marks		Duration of Examination
				Min	Max	
EE/2020/013	AUTO ELECTRICAL TECHNICIAN	Theory	20	10	20	3 Hours
		Practical	30	40	80	
		Total	50	50	100	

EE/2020/013- AUTO ELECTRICAL TECHNICIAN

DETAILED SYLLABUS

Unit No	Modules	No.of.Hours	
		Theory	Practical
I	**Batteries:**	**07 Hours**	
1.1	Lead acid and alkaline batteries	04	03
1.2	Construction and working		
1.3	Battery rating		
1.4	Battery charging methods		
1.5	Testing and maintenance		
II	**Ignition System:**	**09 Hours**	
2.1	Introduction	06	03
2.2	Construction and working of magneto coil and battery coil ignition systems		
2.3	Spark plug types		
2.4	Spark advance mechanisms		
2.5	Electronic ignition systems		
2.6	Transistorized ignition system		
2.7	Solid state ignition systems		
2.8	Capacitor discharge ignition system and distributor less ignition system		
III	**Starting System:**	**07 Hours**	
3.1	Principle	03	04
3.2	Construction and working of starter motor		
3.3	Working of different starter drive units		
IV	**Charging System:**	**07 Hours**	
4.1	Alternators	03	04
4.2	Principle, construction and working		
4.3	Regulators, Introduction to Start / Stop system		
4.4	Integrated starter generator (ISA/ISG)		
V	**Lighting System:**	**10 Hours**	
5.1	Details of head light and side light	02	08
5.2	LED lighting system		
5.3	Head light dazzling and preventive methods		
5.4	Automatic headlight		
5.5	Daytime running lamps		
5.6	Adaptive brake lights		
5.7	Instrument panel lighting		

VI	Accessories And Wiring:	10 Hours	
6.1	Fuses, cables	02	08
6.2	Connectors and selection		
6.3	Multiplexing and de-Multiplexing		
6.4	Automotive Wiring Insulated and earth return system		
6.5	Wiring Diagrams		
6.7	Symbols and standards		
6.8	Horn, wiper system		
6.9	Power window and mirrors		
6.10	Sun roof, defrosters		
	Total Theory and Practical Hours	**20**	**30**
	Total hours	**50**	

HARDWARE REQUIREMENT

S.NO	LIST OF TOOLS /EQUIPMENTS
1	Electrical Tools Set
2	Batteries and Charging System
3	Starting and Ignition System
4	Lighting System
5	Accessories with Wiring Layout

SOFTWARE REQUIREMENT

NIL

REFERENCE BOOKS

S.NO	NAME OF THE BOOK	AUTHOR	PUBLISHER
1	Automotive electrical and electronics	A K BABU	KhannaPublishing
2	The future of electric Vehicles in India	Prakash Nirupama	Zobra Books, 2016
3	The Handbook of Electrical Engineering	GKP	*CL Educate*,

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
	Total Marks	**100**

THEORY MODEL QUESTION PAPER

EE/2020/013 AUTO ELECTRICAL TECHNICIAN

(Maximum Marks: 20)

(N.B: Answer any Twenty questions) **20x1= 20 Marks**

1. What is the formula for Electrical Power?
2. What is reserve capacity of battery?
3. What type of battery is used in automobile?
4. How are positive and negative plates identified in a battery?
5. Why is distilled water added in the battery?
6. What is ampere hour rating?
7. On what factors the power of battery depends?
8. What instrument is used to measure the specific gravity of a liquid?
9. What are the main components in auto electrical system?
10. State True or False. The Internal Combustion engine is not capable of self-starting.
11. What is the function of the ignition system?
12. What is meant by solid state ignition system?
13. What is the use of spark plug?
14. What is starting motor?
15. Draw the simple circuit of car starting system.
16. What are the components of charging system in vehicle electrical system?
17. What is the function of regulator in auto electrical system?
18. What is the function of Alternator in auto electrical system?
19. Expand ISG.
20. Name the lamps which are used in automobile.
21. What is the main purpose of dip switch?
22. What is the use of fuses?
23. What is meant by Multiplexing?
24. What is meant by Head light dazzling?
25. What are the parts of Wiper system?