



GOVERNMENT OF INDIA
MINISTRY OF SKILL DEVELOPMENT & ENTREPRENEURSHIP
DIRECTORATE GENERAL OF TRAINING

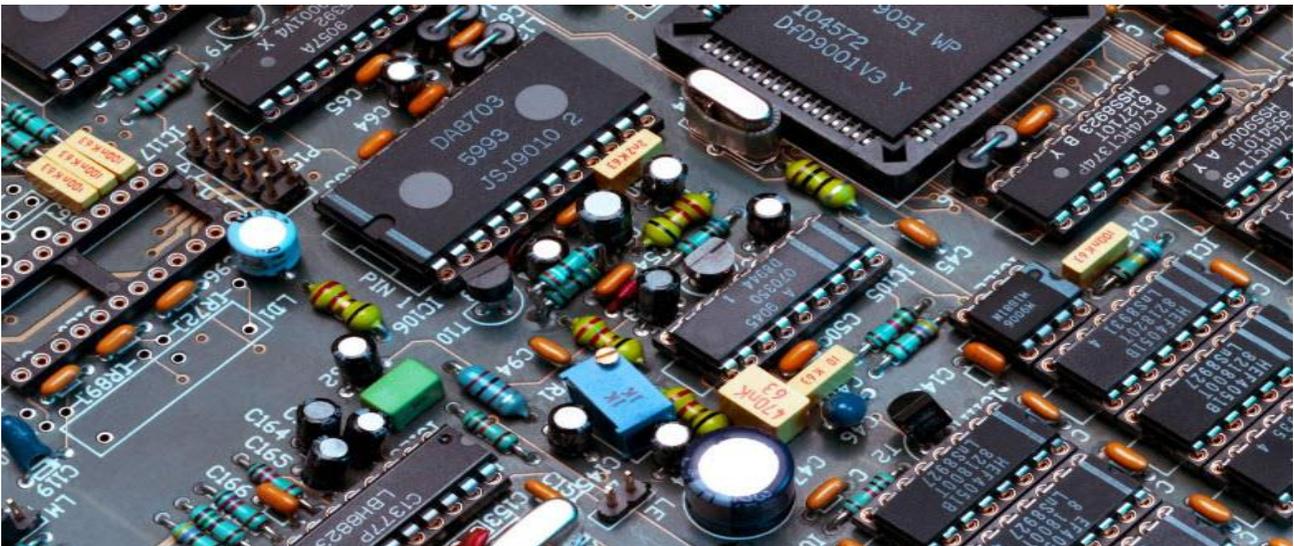
COMPETENCY BASED CURRICULUM

ELECTRONICS MECHANIC

(Duration: Two Years)

CRAFTSMEN TRAINING SCHEME (CTS)

NSQF LEVEL- 5



SECTOR – Electronics & Hardware



Directorate General of Training

ELECTRONICS MECHANIC

(Engineering Trade)

(Revised in 2019)

Version: 1.2

CRAFTSMEN TRAINING SCHEME (CTS)

NSQF LEVEL- 5

Developed By

Ministry of Skill Development and Entrepreneurship

Directorate General of Training

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1. COURSE INFORMATION

During the two-year duration of Electronics Mechanic trade a candidate is trained on professional skill, professional knowledge, Engineering Drawing, Workshop Calculation & Science and Employability skill related to job role. In addition to this a candidate is entrusted to undertake project work and extracurricular activities to build up confidence. The Broad components covered professional skill, subjects are as below:-

FIRST YEAR: In this year the trainee learns about safety and environment, use of fire extinguishers, artificial respiratory resuscitation to begin with. He gets the idea of trade tools & its standardization, Familiarize with basics of electricity, test the cable and measure the electrical parameter. Skilling practice on different types & combination of cells for operation and maintenance of batteries being done. Identify and test passive and active electronic components. Construct and test unregulated and regulated power supplies. Practice soldering and de-soldering of various types of electrical and electronic components on through hole PCBs. Assemble a computer system, install OS, Practice with MS office. Use the internet, browse, create mail IDs, download desired data from internet using search engines. The candidate will be able to construct and test amplifier, oscillator and wave shaping circuits. Testing of power electronic components. Construct and test power control circuits. Identify and test opto electronic devices. Able to achieve the skill on SMD Soldering and De-soldering of discrete SMD components. Verifying the truth tables of various digital ICs by referring Data book. Practice circuit simulation software to simulate and test various circuits. Identify various types of LEDs, LED displays and interface them to a digital counter and test. Construct and test various circuits using linear ICs 741 & 555.

SECOND YEAR: In this year the trainee will be able to operate DSO and perform various functions. Gaining the skill by practicing SMD Soldering and De-soldering of various types of IC Packages. Able to identify the defects and do rework of PCB. Construct and test simple electrical control circuits and various electrical protective devices. Identify, prepare, terminate and test various types of electronic cables used in various electronic systems. Identify various functional blocks and I/O Ports of a 8051 microcontroller system, Familiarize with the instruction set of 8051 micro controller. Interface a model application with the Microcontroller kit and run the application. Construct and test various modulation/demodulation circuits. The trainee will identify and test various types of sensors used in electronic industries and construct and test circuits using various sensors system. They can construct and test analog and digital IC based application circuits as a part of project work. The trainee will work with DPM Modules to measure various electrical parameter, also interface the LCD modules to display a word. They will also skilled with various modulation techniques to acquaint with fibre optic communication techniques by using trainer kit. Identify various functional blocks/major components/ICs in the given stabilizer, rectify the faults. Identify various Input and output sockets/connectors of the given SMPS and UPS. Install and troubleshoot the given solar panel system. Dismantle and assemble various types of cell / smart phones and trouble shoot the cell/smart phone. Dismantle and assemble the given LED light stack. Design a LED light for the given ratings. Assemble decorative lighting system (serial lights) using LED strips. Dismantle, assemble, trouble shoot and rectify LED and LCD TV sets.

Learning outcomes are a reflection of total competencies of a trainee and assessment will be carried out as per the assessment criteria.

5.1 LEARNING OUTCOMES (TRADE SPECIFIC)

FIRST YEAR:

1. Perform basic workshop operations using suitable tools for fitting, riveting, drilling etc. observing suitable care & safety following safety precautions.
2. Select and perform electrical/electronic measurement of single range meters and calibrate the instrument.
3. Test & service different batteries used in electronic applications and record the data to estimate repair cost.
4. Plan and execute soldering & de-soldering of various electrical components like Switches, PCB& Transformers for electronic circuits.
5. Test various electronic components using proper measuring instruments and compare the data using standard parameter.
6. Assemble simple electronic power supply circuit and test for functioning.
7. Install, Configure, interconnect given computer system(s) and demonstrate & utilize application packages for different application.
8. Construct, test and verify the input/output characteristic of various analog circuits.
9. Plan and construct different power electronic circuits and analyse the circuit functioning.
10. Select the appropriate opto electronics components and verify the characteristics in different circuit.
11. Assemble, test and troubleshoot various digital circuits.
12. Simulate and analyze the analog and digital circuits using Electronic simulator software
13. Identify , place, solder and desolder and test different SMD discrete components and IC's package with due care and following safety norms using proper tools/setup
14. Construct and test different circuits using ICs 741 Operational amplifiers & ICs 555 linear integrated circuits and execute the result.

SECOND YEAR:

15. Measure the various parameters by DSO and execute the result with standard one.
16. Rework on PCB after identifying defects from SMD soldering and de-soldering.
17. Construct different electrical control circuits and test for their proper functioning with due care and safety.
18. Prepare, crimp, terminate and test various cables used in different electronics industries.
19. Assemble and test a commercial AM /FM receiver and evaluate performance.

20. Test, service and troubleshoot the various components of different domestic/ industrial programmable systems.
21. Execute the operation of different process sensors, identify, wire & test various sensors of different industrial processes by selecting appropriate test instruments
22. Plan and carry out the selection of a project, assemble the project and evaluate performance for a domestic/commercial applications.
23. Prepare fibre optic setup and execute transmission and reception.
24. Plan and Interface the LCD, LED DPM panels to various circuits and evaluate performance.
25. Detect the faults and troubleshoot SMPS, UPS and inverter.
26. Install a solar panel, execute testing and evaluate performance by connecting the panel to the inverter.
27. Dismantle, identify the various parts and interface of a cell phone to a PC. Estimate and troubleshoot.
28. Check the various parts of a LED lights and stacks and troubleshoot
29. Identify, operate various controls, troubleshoot and replace modules of the LCD/LED TV & its remote.