Model Curriculum

Electrical Technician

SECTOR: Electronics

SUB-SECTOR: Industrial Automation

OCCUPATION: Assembly and Integration

REF ID: ELE/Q6301, Version1.0

NSQF LEVEL: 3

Skill India
कौशल भारत-कुशल भारत

ESSCI
Skilling India in Electronics

N·S·D·C
National
Skill Development
Corporation
Transforming the skill landscape

Certificate

CURRICULUM COMPLIANCE TO QUALIFICATION PACK - NATIONAL OCCUPATIONAL STANDARDS

is hereby issued by the

ELECTRONIC SECTOR SKILLS COUNCIL OF INDIA

for the

MODEL CURRICULUM

Complying to National Occupational Standards of
Job Role/ Qualification Pack: **'Electrical Technician Version1.0'**
QP No. 'ELE/Q6301 NSQF Level 3'

Date of Issuance : August 15th, 2018
Valid up to* : August 15th, 2021
*Valid up to the next review date of the Qualification Pack

Authorised Signatory
(Electronic Sector Skills Council of India)

TABLE OF CONTENTS

1. Curriculum 01

2. Trainer Prerequisites 06

3. Annexure: Assessment Criteria 07

Electrical Technician

CURRICULUM / SYLLABUS

This program is aimed at training candidates for the job of a **"**Electrical Technician**",** in the "Electronics" Sector/Industry and aims at building the following key competencies amongst the learner.

Program Name	**Electrical Technician**		
Qualification Pack Name & Reference ID	ELE/Q6301, VERSION 1.0		
Version No.	1.0	**Version Update Date**	15/08/18
Prerequisites to Training	10th Standard passed		
Training Outcomes	**After completing this programme, the participants will be able to:** • Identify the role, responsibilities and scope of work of an electrical technician • Illustrate the basic concepts of electricity and electronics • Demonstrate assembling of PCBs and other electrical modules to form an electrical sub-system • Illustrate working efficiently with superiors and colleagues • Follow safety procedures		

This course encompasses 03 out of 03 National Occupational Standards (NOS) of "Electrical Technician" Qualification Pack issued by "Electronics Sector Skills Council of India".

Sr. No.	Module	Key Learning Outcomes	Equipment Required
1.	**Introduction to Electrical Technician** Theory Duration (hh:mm) 20:00 Practical Duration (hh:mm) 30:00 Corresponding NOS Code Bridge Module	• Identify the role and responsibilities of an electrical technician • Use technical drawings and layout • List the various principles of wiring and PCB assembly • Follow the instructions involved in assembling electro-mechanical products • List and define the parameters of an electric circuit such as voltage, current and resistance • Define Ohm's law and implement it for calculations • Differentiate between AC and DC, series and parallel connections • List different components used in a circuit and identify how to read their values	Components such as Transistor, Resistor, Capacitor, Inductor, Tuner, Transformer and so on PCB, wires
2.	**Integration of electrical sub systems** Theory Duration (hh:mm) 20:00 Practical Duration (hh:mm) 50:00 Corresponding NOS Code ELE/N6301	• Interact with the supervisor to interpret work plan • Identify the production requirement • Identify the different modules of the sub system • Interpret the circuit design and the diagram and functioning of the product modules • Organize various other components such as wires, connectors and job instructions • Inspect and record faults in the PCB board and its components and coordinate with PCB assembly team for repair • Implement the standard	Electrical sub system of the final products with remote Screw Drivers, Spanners, Drill Machine, Multi-meter, Circuit Tester, Scissors, Pliers Pencil Electrical tape, piano wire, Wall Mount Kit Antenna, STB Measuring Tape, Hammer, Crimping Tools, Cutter/ knife, Digital IC tester with manual/Batch CRO Soldering Tool Kit, SMD Soldering Tools Manual Guide, Trainer Kit

		operating procedures for assembling the sub system as per the specifications • Identify errors, defects, inadequate consumables and problems in assembly process and report to the supervisor • Implement proper handling of different electrical and mechanical products • Identify how to maintain different tools in the assembly process • Implements the elements of 5S to maintain quality standards and productivity • Prepare the documents after completion of work	
3.	**Interaction with Colleagues and Supervisors** Theory Duration (hh:mm) 20:00 Practical Duration (hh:mm) 20:00 Corresponding NOS Code ELE/N9971	• Illustrate how to interact with supervisor and escalate problems or hazards • Use proper interpersonal skills and etiquettes while interacting with colleagues • Resolve personal conflicts • Demonstrate team building skills to work effectively in a team and implement workplace etiquettes • Demonstrate ideal -workplace ethics while interacting with colleagues • Comply with the recommended practices according to the work requirements • Identify the reporting structure, inter-department functions and lines and procedures in the work area • Identify the importance of effective communication	Projector, PPT
4.	**Workplace Safety** Theory Duration (hh:mm)	• Identify the potential hazards • Use proper steps to ensure a safe work place • Apply electrical safety	ESD pins, antistatic gloves, air ionizer, antistatic wrist strap, safety clothes and antistatic shoe

	20:00 Practical Duration (hh:mm) 20:00 Corresponding NOS Code ELE/N9972	guidelines by using proper PPE and ESD measures as per the instructions received in the training • Use evacuation procedure and participate in fire drills • Use the safety equipment and protection devices such as Fire extinguisher and First aid equipment • Maintain proper posture while working • Participate in health sessions organized by the company like yoga, physiotherapy et • Use proper equipment to handle heavy material • Comply with the daily safety instructions and the other recommended safety procedures for work—before starting work, while working, after finishing work • Use proper techniques for disposal of hazardous chemicals, tools and materials by following prescribed environmental norms or as per company policy	Respirator, mask, skull caps, gloves, goggles and jacket Fire extinguisher, First aid equipment
	Total Duration 200:00 Theory Duration 80:00 Practical Duration 120:00	Unique Equipment Required: Service Manual/ User Manuals (each) Desoldering Pump, Digital Multimeter, IC Chip Extractor, Insulation Tape Line Tester, Lead Solder, Soldering Iron, Soldering Flux, Soldering Station Magnifying Lens, Nose Pliers, Power Supply, Precision Screw Driver, Screw Driver Set, Shear Cutters, Torque Screwdriver Set, PCB/Modules & Electrical Sub Systems of the Final Product, Universal Crimp Tool, Wire Stripper, Special Test Jigs for testing specific PCB/ Modules Safety Helmet, ESD Gloves, ESD Mat, ESD Wrist Band, Safety Shoes	

Grand Total Course Duration: **200 Hours 0 Minutes**
(This syllabus/ curriculum has been approved by ***Electronics Sector Skills Council of India)***

Trainer Prerequisites for Job role: "Electrical Technician" mapped to Qualification Pack: "ELE/ Q6301" Version 1.0

Sr. No.	Area	Details
1	**Job Description**	To deliver accredited training service, mapping to the curriculum detailed above, in accordance with the Qualification Pack "ELE/Q6301, version 1.0"
2	**Personal Attributes**	Aptitude for conducting training, and pre/ post work to ensure competent, employable candidates at the end of the training. Strong communication skills, interpersonal skills, ability to work as part of a team; a passion for quality and for developing others; well-organized and focused, eager to learn and keep oneself updated with the latest in the mentioned field.
3	**Minimum Educational Qualifications**	Diploma (Electronics)
4a	**Domain Certification**	Certified for Job Role: "Electrical Technician" mapped to QP: "ELE/ Q6301, version1.0". Minimum accepted score is 80%
4b	**Platform Certification**	Recommended that the Trainer is certified for the Job Role: "Trainer", mapped to the Qualification Pack: "MEP/Q2601". Minimum accepted score is 80%
5	**Experience**	Minimum 2-year experience as Electrical Technician Minimum 1-year experience as a trainer with hands on assembly of PCB/ Modules & electrical sub systems of product

Assessment Criteria for "Electrical Technician"

Job Role	Electrical Technician
Qualification Pack	ELE/Q6301, Version1.0
Sector Skill Council	Electronics Sector Skills Council of India

Guidelines for Assessment

1. Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down proportion of marks for Theory and Skills Practical for each PC.
2. The assessment for the theory part will be based on knowledge bank of questions created by the SSC.
3. Assessment will be conducted for all compulsory NOS
4. Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training centre (as per assessment criteria below).
5. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training centre based on this criterion.
6. To pass the Qualification Pack, every trainee should score a minimum of 70% aggregate.
7. In case of unsuccessful completion, the trainee may seek reassessment on the qualification pack

Compulsory NOS **Total Marks: 300**			**Marks Allocation**		
Assessment Outcomes	**Performance criteria**	**Total Marks**	**Out of**	**Theory**	**Skills Practical**
ELE/N6301 Integrate electrical sub system	PC1. interact with the supervisor in order to understand the day's production requirement and plan work	100	3	1	2
	PC2. use approved drawings, job instructions or work manuals		4	1	3
	PC3. collect assembled PCBs from the assembly team		5	2	3
	PC4. collect consumables such as wires and connectors need for the assembly process		6	2	4
	PC5. collect the work manual/job instruction from the supervisor		6	3	3
	PC6. visually inspect the boards and components received for any physical damage, any loose or wrong connections		6	2	4
	PC7. record faults and pass the board on to the PCB assembly team for re-work		6	2	4
	PC8. follow the standard operating procedure to assemble the electrical		6	2	4

	sub system				
	PC10.interpret accurately drawings, wiring and job pecifications/instructions		5	2	3
	PC11. ensure that the finished assembly meets specifications		5	2	3
	PC12. coordinate with the PCB assembly team to ensure that production targets are met		5	2	3
	PC13. highlight any errors in previous step of the assembly process identified		4	2	2
	PC14. report defective or inadequate number of components		4	2	2
	PC15. report about inadequate quantity of consumables such as wires, connectors, screws, nuts, etc.		4	2	2
	PC16. meet 100% target for number of products to be manufactured per day		3	2	1
	PC17. achieve 100% of planned work as scheduled		3	1	2
	PC18. achieve zero errors as per company's standards		3	1	2
	PC19.achieve zero damage because of electrostatic discharge		4	2	2
	PC20. keep work area clean and organized identify		3	1	2
	PC21. report any problems in the assembly line in time		3	1	2
	PC22. record any defects/inadequacies noted during the assembly process		4	1	3
	PC23. maintain safety standards as per company policy		4	2	2
	PC24. achieve clean work protocols		4	2	2
			100	**40**	**60**
ELE/N9971 Coordinate with others	PC1. understand work requirements, targets and incentives	100	5	2	3
	PC2. learn about new product models, their features and functions		6	3	3
	PC3. report problems identified in the field		6	3	3
	PC4. escalate Supervisor or Production Management concerns that cannot be handled on field		6	2	4
	PC5. resolve personnel issues		6	2	4
	PC6. receive feedback on work standards and Supervisor or Production Management satisfaction		6	2	4
	PC7. communicate any potential hazards at a particular location		6	2	4

	PC8. meet given targets		6	2	4
	PC9. deliver work of expected quality despite constraints		6	2	4
	PC10. Have feedback from a happy and satisfied Supervisor or Production Management		5	2	3
	PC11. resolve inter-personnel conflicts and achieve smooth workflow		7	3	4
	PC12. receive spares from tool room or stores		7	3	4
	PC13. deposit faulty modules and tools to stores		7	3	4
	PC14. pass on Supervisor or Production Management complaints to colleagues in a respective geographical area		7	3	4
	PC15. assist colleagues with resolving field problems		7	3	4
	PC16. clearly demarcate roles of each team member		7	3	4
			100	**40**	**60**
ELE/N9963 Maintain safe work surroundings	PC1. comply with general safety procedures followed in the company	**100**	7	4	3
	PC2. follow standard safety procedures while handling an equipment, hazardous material or tool		7	4	3
	PC3. use of safety materials such as goggles, gloves, ear plugs, caps, ESD pins, covers, shoes, etc.		7	3	4
	PC4. escalate about any hazardous materials or things found in the premises		7	3	4
	PC5. report about any breach of safety procedure in the company		6	2	4
	PC6. ensure zero accidents at work		6	2	4
	PC7. avoid damage of components due to negligence in ESD procedures		6	3	3
	PC8. regularly participate in fire drills or other safety related workshops organized by the company		6	2	4
	PC9. ensure no loss for company due to safety negligence		6	2	4
	PC10. maintain appropriate posture, especially in long hours of sitting or standing position and in handling heavy materials		14	5	9

	PC11. Participate in company organized health sessions such as yoga, physiotherapy or games		14	5	9
	PC12. handle heavy and hazardous materials with care and using appropriate tools and handling equipment such as trolleys, jacks and ladders		14	5	9
			100	**40**	**60**
		Total	300	120	180