



EMS Operation & Maintenance Manager

QP Code: ELE/Q5312

Version: 3.0

NSQF Level: 6

Electronics Sector Skills Council of India || 155, 2nd Floor, ESC House Okhla Industrial Area-Phase 3
New Delhi- 110020 || email:rakhi@essc-india.org



Qualification Pack

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ELE/Q5312: EMS Operation & Maintenance Manager

Brief Job Description

Electronics Manufacturing Services Operation & Maintenance Manager in this job plans production targets of SMT machines and ensures that all the resources to perform the tasks are in a good working condition. The individual should have understanding of Electronic Manufacturing Service (contract manufacturing) and should be able to maintain the SMT production processes and relevant equipment.

Personal Attributes

The individual need to have a high level of manual dexterity/capability and need to have basic understanding of Electronic Manufacturing Service (Contract manufacturing). They also need to be good communicators and listeners and should be able to solve problems independently.

Applicable National Occupational Standards (NOS)

Compulsory NOS:

- [1. ELE/N5313: Manage SMT machines](#)
- [2. ELE/N5314: Manage production process, material quality and machines](#)
- [3. ELE/N1002: Apply health and safety practices at the workplace](#)
- [4. DGT/VSQ/N0102: Employability Skills \(60 Hours\)](#)

Qualification Pack (QP) Parameters

Sector	Electronics
Sub-Sector	Electronics Manufacturing System
Occupation	Maintenance-PCB
Country	India
NSQF Level	6
Credits	30
Aligned to NCO/ISCO/ISIC Code	NCO-2015/2152.9900

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Minimum Educational Qualification & Experience	12th grade Pass with 4 Years of experience Relevant OR 12th grade pass with 2 year NTC/ CITS/NAC with 2 Years of experience Relevant OR Completed 2nd year diploma after 12th with 2 Years of experience Relevant OR Completed 3 year UG degree with 1 Year of experience Relevant OR Previous relevant Qualification of NSQF Level (5) with 3 Years of experience Relevant
Minimum Level of Education for Training in School	12th Class
Pre-Requisite License or Training	NA
Minimum Job Entry Age	21 Years
Last Reviewed On	NA
Next Review Date	27/01/2025
NSQC Approval Date	27/01/2022
Version	3.0
Reference code on NQR	QG-06-EH-01339-2023-V1.1-ESSC
NQR Version	1.0

Remarks:

NA



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ELE/N5313: Manage SMT machines

Description

This OS unit is about management of Surface Mount Technology (SMT) machines, Controlling the machine working procedure and maintenance. The individual must comply with related occupational health & safety guidelines while carrying out the Work.

Scope

The scope covers the following :

- Manage SMT machines
- Maintain Documentation

Elements and Performance Criteria

Manage SMT machines

To be competent, the user/individual on the job must be able to:

- PC1.** identify magazine loader to supply Printed Circuit Board (PCB) for production
- PC2.** guide the un-loader to unload the assembled PCB
- PC3.** set up chart for screen printer parameters such as program name, squeeze speed, 2D inspection mode, etc.
- PC4.** verify the specification of stencil mask and order the new stencil
- PC5.** oversee the selected feeder and nozzle as per the product
- PC6.** ensure that part library and shift data are as per the standard guidelines
- PC7.** ensure that the program has been created and executed as per the standard procedure
- PC8.** advise resolution of errors if the machine gets stuck due to any reason
- PC9.** guide the engineer for setting the soaking temperature profile to maintain the temperature for air reflow oven and Nitrogen (N₂) reflow oven and preparing the model-wise dummy PCB as per procedure
- PC10.** monitor each process to ensure quality of product with zero defects
- PC11.** observe the feedback for any defects through Automated Optical Inspector (AOI) and take corrective actions
- PC12.** guide the solder paste inspector to modify inspection part library for solder short, missing, shift, etc.
- PC13.** supervise the program and debug it for false call
- PC14.** check critical operating check points as per the standard check sheet
- PC15.** plan and adhere to the model changeover procedure as per production planning
- PC16.** ensure that the machine is in a good working condition and maintenance is carried out as per the schedule

Maintain Documentation

To be competent, the user/individual on the job must be able to:

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- PC17.** organise daily, weekly and monthly preventive maintenance schedule as per the recommendation from the manufacturer
- PC18.** maintain required documents as per the company policy documents: production report, work instructions, operating checkpoint, maintenance check-sheet, etc.

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** companys policies on: incentives, delivery standards, and personnel management
- KU2.** work flow involved in assembly process of the company
- KU3.** importance of the individuals role in the workflow
- KU4.** reporting structure, inter-dependent functions, lines and procedures in the work area
- KU5.** importance of working in clean and safe environment practices and procedures
- KU6.** relevant people and their responsibilities within the work area
- KU7.** standard operating procedures in the organisation such as magazine & pcb loading procedure, changeover procedure
- KU8.** basic knowledge of electronics devices
- KU9.** knowledge of various parts used in printed circuit board (pcb) assembly process
- KU10.** basic knowledge of surface-mount technology (smt) machines
- KU11.** effective training methodologies to develop quality culture in the organization
- KU12.** troubleshooting approaches - root cause analysis
- KU13.** terms and conditions of manufacturing
- KU14.** knowledge of 5s & electro static discharge (esd) measures
- KU15.** knowledge and awareness of all safety rules, policies and procedures, quality standards to be followed in the process
- KU16.** basic knowledge of surface mount technology & its devices
- KU17.** production planning and scheduling
- KU18.** how to prepare work instructions
- KU19.** how to read component drawing and interpret bill of material (bom)
- KU20.** methods to identify operational problems
- KU21.** important terms used in the production
- KU22.** importance of standard operating procedures
- KU23.** how to interpret manufacturers instructions
- KU24.** various tools used to measure progress to target
- KU25.** test protocols for visual and functional testing of electrical parts and assemblies

Generic Skills (GS)

User/individual on the job needs to know how to:

- GS1.** develop work instructions



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- GS2.** prepare various production reports
- GS3.** indent components as per the Bill of Material (BOM)
- GS4.** prepare machine breakdown reports, incident reports etc.
- GS5.** read warnings, instructions and other text material on product labels, components, etc.
- GS6.** read component and assembly drawings
- GS7.** interpret work instructions and sequence of operations
- GS8.** interpret various quality standards
- GS9.** interpret test results
- GS10.** provide instructions to technicians and inspectors
- GS11.** interact with suppliers and machine manufacturers to seek clarifications
- GS12.** act immediately in case of machine breakdown or quality issues
- GS13.** escalate unresolved problems
- GS14.** sequence activities in case of a new product
- GS15.** organize resources for production
- GS16.** sequence activities as per work instructions establish testing methods
- GS17.** interact with internal and external stakeholders politely
- GS18.** provide 100% defect free products within the stipulated time period
- GS19.** respond to emergency situations
- GS20.** act in case of machine breakdown
- GS21.** handle quality deviation issues
- GS22.** interpret accurately drawings, wiring and instructions
- GS23.** improve the production process continually

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Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Manage SMT machines</i>	36	45	-	10
PC1. identify magazine loader to supply Printed Circuit Board (PCB) for production	2	3	-	-
PC2. guide the un-loader to unload the assembled PCB	2	3	-	-
PC3. set up chart for screen printer parameters such as program name, squeeze speed, 2D inspection mode, etc.	2	3	-	-
PC4. verify the specification of stencil mask and order the new stencil	3	3	-	1
PC5. oversee the selected feeder and nozzle as per the product	3	3	-	1
PC6. ensure that part library and shift data are as per the standard guidelines	2	2	-	-
PC7. ensure that the program has been created and executed as per the standard procedure	2	3	-	1
PC8. advise resolution of errors if the machine gets stuck due to any reason	2	3	-	1
PC9. guide the engineer for setting the soaking temperature profile to maintain the temperature for air reflow oven and Nitrogen (N ₂) reflow oven and preparing the model-wise dummy PCB as per procedure	2	3	-	1
PC10. monitor each process to ensure quality of product with zero defects	2	3	-	1
PC11. observe the feedback for any defects through Automated Optical Inspector (AOI) and take corrective actions	2	3	-	1
PC12. guide the solder paste inspector to modify inspection part library for solder short, missing, shift, etc.	3	2	-	1

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC13. supervise the program and debug it for false call	2	3	-	1
PC14. check critical operating check points as per the standard check sheet	2	3	-	1
PC15. plan and adhere to the model changeover procedure as per production planning	3	2	-	-
PC16. ensure that the machine is in a good working condition and maintenance is carried out as per the schedule	2	3	-	-
<i>Maintain Documentation</i>	4	5	-	-
PC17. organise daily, weekly and monthly preventive maintenance schedule as per the recommendation from the manufacturer	2	2	-	-
PC18. maintain required documents as per the company policy documents: production report, work instructions, operating checkpoint, maintenance check-sheet, etc.	2	3	-	-
NOS Total	40	50	-	10



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National Occupational Standards (NOS) Parameters

NOS Code	ELE/N5313
NOS Name	Manage SMT machines
Sector	Electronics
Sub-Sector	Electronics Manufacturing System
Occupation	Manufacturing
NSQF Level	6
Credits	TBD
Version	2.0
Last Reviewed Date	27/01/2022
Next Review Date	27/01/2025
NSQC Clearance Date	27/01/2022

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ELE/N5314: Manage production process, material quality and machines

Description

This OS unit is about controlling, production process, SMT material, consumables, equipment and spare parts, controlling of the quality of assembled electronics product, management of full line, maintenance of machines and controlling the documents of all stages of SMT line.

Scope

The scope covers the following :

- Control SMT material, consumables, equipment & spare parts
- Plan production processes
- Monitor and control PCBA quality
- Maintenance of assembly line
- Carryout documentation

Elements and Performance Criteria

Control SMT material, consumables, equipment & spare parts

To be competent, the user/individual on the job must be able to:

- PC1.** identify material supply and in/out process
- PC2.** handle the material control procedure and Bill Of Material (BOM)
- PC3.** oversee the process of setting up the kitting system
- PC4.** check storage check point for in/out process
- PC5.** monitor consumable control procedure for smooth functioning
- PC6.** supervise the setting up of line to facilitate installation of equipment and equipment levelling
- PC7.** verify the equipment history card and spare parts master list

Plan production processes

To be competent, the user/individual on the job must be able to:

- PC8.** check the line production capability including operational loss
- PC9.** lead the team for product production plan with agreed scheduled
- PC10.** monitor the processes and machine down time to ensure that the operational and product efficiency are as per standards

Monitor and control PCBA quality

To be competent, the user/individual on the job must be able to:

- PC11.** ensure that the quality data is controlled in PPM and not in percentage
- PC12.** verify the record quality data and monitoring report as per company policies
- PC13.** check for quality defects to achieve highest quality standards and take corrective actions

Maintenance of assembly line

To be competent, the user/individual on the job must be able to:

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- PC14.** monitor and manage the production process from loading bare PCB in loader to screen printer printing, solder paste inspection, mounting of components, soldering in reflow oven, inspection by AOI and un-loading of populated PCB in magazine rack
- PC15.** verify that there is no shut down of machine due to improper maintenance
- PC16.** ensure that regular cleaning and lubrication processes are carried out as prescribed by manufacturers
- PC17.** identify defects in process and take immediate corrective action on any accidents occurring during process

Carryout documentation

To be competent, the user/individual on the job must be able to:

- PC18.** organise reports, procedures, work instructions, setup chart and check-sheets as recommended
- PC19.** ensure that correct and accurate production quantity is entered in the report

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** companys policies on incentives, delivery standards, and personnel management
- KU2.** work flow involved in the assembly process of the company ka3. importance of the individuals role in the workflow
- KU3.** importance of the individuals role in the workflow
- KU4.** reporting structure, inter-dependent functions, lines and procedures in the work area
- KU5.** importance of working in clean and safe environment practices and procedures
- KU6.** relevant people and their responsibilities within the work area
- KU7.** basic knowledge of surface mount technology
- KU8.** component drawing and interpret bill of material (BOM)
- KU9.** how to calculate rlc (r-resistance, l- inductance, c- capacitor) values and read their polarity
- KU10.** material handling & material in/out control
- KU11.** how to read component drawing and interpret bill of material (BOM)
- KU12.** how to identify the component locations & type on PCB
- KU13.** basic knowledge of SMTmachines & spare parts
- KU14.** importance of standard operating procedures
- KU15.** how to interpret manufacturers instructions
- KU16.** various tools used to measure progress to target
- KU17.** how to estimate costs involved in each stage of production
- KU18.** effective training methodologies to develop quality culture in the organization
- KU19.** importance of work instructions and workmanship
- KU20.** how to provide manufacturing data manufacturing data: production control charts, reliability, process capability etc.
- KU21.** various quality standards used in the production and their importance
- KU22.** knowledge of 5s & electro static discharge (esd) measures

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KU23. knowledge and awareness of all safety rules, policies and procedures, quality

KU24. standards to be followed in the process

Generic Skills (GS)

User/individual on the job needs to know how to:

- GS1.** prepare various management reports on the performance
- GS2.** prepare staff training calendar
- GS3.** prepare escalation reports
- GS4.** interpret production control charts
- GS5.** read various process improvement documents
- GS6.** interpret Quality Management System (QMS)
- GS7.** read job and specification sheet and technical writing
- GS8.** provide instructions to technicians and quality inspectors
- GS9.** interact with suppliers and machine manufacturers to seek clarifications
- GS10.** interact with competent authority for any clarification or advice
- GS11.** communicate with competent authority regarding performance of the shop floor
- GS12.** act independently in case of machine breakdown or quality issues
- GS13.** escalate unresolved problems
- GS14.** sequence activities in case of a new product
- GS15.** identify resources for data gathering
- GS16.** organize data and generate reports as per the schedule
- GS17.** provide reports to competent authority as per the guidelines
- GS18.** communicate with internal /external stakeholders politely
- GS19.** check for the erroneous data and the actions to be taken to correct the data
- GS20.** interpret accurately drawings and instructions
- GS21.** improve work processes

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Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Control SMT material, consumables, equipment & spare parts</i>	16	18	-	6
PC1. identify material supply and in/out process	2	2	-	1
PC2. handle the material control procedure and Bill Of Material (BOM)	2	3	-	1
PC3. oversee the process of setting up the kitting system	2	3	-	1
PC4. check storage check point for in/out process	2	3	-	-
PC5. monitor consumable control procedure for smooth functioning	3	3	-	1
PC6. supervise the setting up of line to facilitate installation of equipment and equipment levelling	3	2	-	1
PC7. verify the equipment history card and spare parts master list	2	2	-	1
<i>Plan production processes</i>	6	9	-	2
PC8. check the line production capability including operational loss	2	3	-	1
PC9. lead the team for product production plan with agreed scheduled	2	3	-	-
PC10. monitor the processes and machine down time to ensure that the operational and product efficiency are as per standards	2	3	-	1
<i>Monitor and control PCBA quality</i>	6	9	-	2
PC11. ensure that the quality data is controlled in PPM and not in percentage	2	3	-	1
PC12. verify the record quality data and monitoring report as per company policies	2	3	-	1

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC13. check for quality defects to achieve highest quality standards and take corrective actions	2	3	-	-
<i>Maintenance of assembly line</i>	9	11	-	-
PC14. monitor and manage the production process from loading bare PCB in loader to screen printer printing, solder paste inspection, mounting of components, soldering in reflow oven, inspection by AOI and un-loading of populated PCB in magazine rack	3	3	-	-
PC15. verify that there is no shut down of machine due to improper maintenance	2	3	-	-
PC16. ensure that regular cleaning and lubrication processes are carried out as prescribed by manufacturers	2	2	-	-
PC17. identify defects in process and take immediate corrective action on any accidents occurring during process	2	3	-	-
<i>Carryout documentation</i>	3	3	-	-
PC18. organise reports, procedures, work instructions, setup chart and check-sheets as recommended	1	3	-	-
PC19. ensure that correct and accurate production quantity is entered in the report	2	-	-	-
NOS Total	40	50	-	10



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National Occupational Standards (NOS) Parameters

NOS Code	ELE/N5314
NOS Name	Manage production process, material quality and machines
Sector	Electronics
Sub-Sector	Electronics Manufacturing System
Occupation	Manufacturing
NSQF Level	6
Credits	TBD
Version	2.0
Last Reviewed Date	27/01/2022
Next Review Date	27/01/2025
NSQC Clearance Date	27/01/2022

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ELE/N1002: Apply health and safety practices at the workplace

Description

This OS unit is about knowledge and practices relating to health, safety and security that candidates need to use in the workplace.

Scope

The scope covers the following :

- Deal with workplace hazards
- Apply fire safety practices
- Follow emergencies, rescue and first-aid procedures
- Effective waste management/recycling practices

Elements and Performance Criteria

Deal with workplace hazards

To be competent, the user/individual on the job must be able to:

- PC1.** identify job-site hazards and possible causes of accident in the workplace
- PC2.** perform work complying to organizational safe working practices and observing hazard signs displayed on containers, equipment and in various work areas such as inside buildings, in open areas and public spaces, etc.
- PC3.** use appropriate personal protective equipment (PPE) for specific tasks and work conditions, contaminant (concentration w.r.t air) requirements and severity of hazard while conforming to the Indian/International standards
- PC4.** follow standard safety procedures while handling tool/ ,equipment, hazardous substances and while working in hazardous environments
- PC5.** dispose electronic waste (such as toxins; metals such as lead, cadmium, barium; flame retardant plastics, welding slag etc.) as per industry approved techniques
- PC6.** avoid damage of components due to negligence in electrostatic discharge (ESD) procedures
- PC7.** locate general health and safety equipment in the workplace such as fire extinguishers; first aid equipment; safety instruments, clothing and installations (fire exits, exhaust fans)
- PC8.** maintain appropriate posture while handling heavy objects
- PC9.** apply good housekeeping practices at all times

Apply fire safety practices

To be competent, the user/individual on the job must be able to:

- PC10.** take preventive measures to prevent fire hazards
- PC11.**
 - use appropriate fire extinguishers for different types of fires
 - Types of fires: Class A: e.g. ordinary solid combustibles, such as wood, paper, cloth, plastic, charcoal, etc.; Class B: flammable liquids and gases, such as gasoline, propane, diesel fuel, tar, cooking oil, and similar substances; Class C: e.g. electrical equipment such as appliances, wiring, breaker panels, etc. (These categories of fires become Class A, B, and D fires when the electrical equipment that initiated the fire is no l
- PC12.** exhibit rescue and first-aid techniques in case of fire or electrocution

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Follow emergencies, rescue and first-aid procedures

To be competent, the user/individual on the job must be able to:

- PC13.** administer appropriate first aid to victims in case of bleeding, burns, choking, electric shock, poisoning etc.
- PC14.** administer first aid to victims in case of a heart attack or cardiac arrest due to electric shock,
- PC15.** participate regularly in emergency procedures such as raising alarm, safe/efficient, evacuation, correct means of taking shelter and escaping, correct assembly point, roll call, correct return to work
- PC16.** use correct method to move injured people and others during an emergency

Effective waste management/recycling practices

To be competent, the user/individual on the job must be able to:

- PC17.** identify recyclable and non-recyclable, and hazardous waste generated
- PC18.** segregate waste into different categories
- PC19.** ensure disposal of non-recyclable waste appropriately
- PC20.** deposit non-recyclable and reusable material at identified location
- PC21.** follow processes specified for disposal of hazardous waste

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** importance of working in clean and safe work environment following safety practices and procedures
- KU2.** health and safety roles and responsibilities of relevant personnel within and outside the organisation
- KU3.** key internal and external sources of health and safety information
- KU4.** basic knowledge of electronic devices and related health risks
- KU5.** meaning of hazards and risks
- KU6.** various types of health and safety hazards commonly present in the work environment such as physical hazards, electrical hazards, chemical hazards, fire hazards, equipment related hazards, health hazards, etc.
- KU7.** methods of accident prevention
- KU8.** importance of using protective clothing/equipment while working
- KU9.** general principles for identifying and controlling health and safety risks
- KU10.** main hazards and preventive as well as control measures while working with different types of equipment
- KU11.** importance of carrying out electrical and non-electrical isolation to prevent hazards from loss of machine/system/process control
- KU12.** main hazards and preventive as well as control measures when working with electrical systems or using electrical equipment
- KU13.** forms and classifications of hazardous substances
- KU14.** safe working practices while working at various hazardous sites
- KU15.** prevention and control measures to reduce risks from exposure to hazardous substances

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- KU16.** health effects associated with exposure to noise and vibration and the appropriate control measures
- KU17.** precautionary activities to prevent the fire accident
- KU18.** various causes of fire such as heating of metal, spontaneous ignition, sparking, electrical eating, loose fires (smoking, welding, etc.) chemical fires etc.
- KU19.** techniques of using the different fire extinguishers
- KU20.** different methods and material to extinguish fires
- KU21.** different materials used for extinguishing fire such as sand, water, foam, CO₂, dry powder
- KU22.** rescue techniques used during a fire hazard
- KU23.** various types of safety signs and their meaning
- KU24.** basic first aid treatment relevant to the common work place injuries e.g. shock, electrical shock, bleeding, breaks to bones, minor burns, resuscitation, poisoning, eye injuries
- KU25.** contents of written accident report
- KU26.** potential injuries and ill health associated with incorrect handling of tools and equipment
- KU27.** safe lifting and carrying practices
- KU28.** potential impact to a person who is moved incorrectly
- KU29.** personal safety, health and dignity issues relating to the movement of a person by others
- KU30.** ESD measures and 5S
- KU31.** efficient utilization and management of material and water
- KU32.** ways to recognize common electrical problems and practices of conserving electricity
- KU33.** usage of different colours of dustbins, categorization of waste into dry, wet, recyclable, nonrecyclable and items of single-use plastics
- KU34.** organization's procedure for minimizing waste
- KU35.** waste management and methods of waste disposal
- KU36.** common sources of pollution and ways to minimize it
- KU37.** names, contact information and location of people responsible for health and safety in the workplace
- KU38.** location of documents and equipment for health and safety compliance/practices in the workplace
- KU39.** safety notices, signs and instructions at workplace

Generic Skills (GS)

User/individual on the job needs to know how to:

- GS1.** interpret general health and safety guidelines labels, charts, signages
- GS2.** read operation manuals
- GS3.** write health and safety compliance report
- GS4.** write an accident/incident report in local language or English
- GS5.** provide an emergency or safety incident brief to seniors or relevant authorities in a calm, clear and to-the-point manner
- GS6.** communicate general health and safety guidelines to colleagues/co-workers



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- GS7.** communicate appropriately with co-workers in order to clarify instructions and other issues
- GS8.** act in case of any potential hazards observed in the work place
- GS9.** plan and organize their own work schedule, work area, tools, equipment in compliance with organizational policies for health, safety and security
- GS10.** take adequate measures to ensure the safety of clients and visitors at the workplace
- GS11.** identify immediate or temporary solutions to resolve delays
- GS12.** evaluate the work area for health and safety risks or hazards
- GS13.** use cause and effect relations to anticipate potential issues, problems and their solution in the work area related to safety
- GS14.** recognise emergency and potential emergency situations
- GS15.** protect self and others from a health and safety risk or hazard
- GS16.** communicate and collaborate to incorporate sustainable practices (greening) in workplace processes
- GS17.** record data on waste disposal at workplace

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Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Deal with workplace hazards</i>	20	31	-	-
PC1. identify job-site hazards and possible causes of accident in the workplace	2	3	-	-
PC2. perform work complying to organizational safe working practices and observing hazard signs displayed on containers, equipment and in various work areas such as inside buildings, in open areas and public spaces, etc.	3	4	-	-
PC3. use appropriate personal protective equipment (PPE) for specific tasks and work conditions, contaminant (concentration w.r.t air) requirements and severity of hazard while conforming to the Indian/International standards	3	4	-	-
PC4. follow standard safety procedures while handling tool/ ,equipment, hazardous substances and while working in hazardous environments	3	4	-	-
PC5. dispose electronic waste (such as toxins; metals such as lead, cadmium, barium; flame retardant plastics, welding slag etc.) as per industry approved techniques	2	4	-	-
PC6. avoid damage of components due to negligence in electrostatic discharge (ESD) procedures	2	3	-	-
PC7. locate general health and safety equipment in the workplace such as fire extinguishers; first aid equipment; safety instruments, clothing and installations (fire exits, exhaust fans)	2	3	-	-
PC8. maintain appropriate posture while handling heavy objects	1	3	-	-
PC9. apply good housekeeping practices at all times	2	3	-	-
<i>Apply fire safety practices</i>	4	9	-	-
PC10. take preventive measures to prevent fire hazards	2	3	-	-

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC11. <ul style="list-style-type: none"> use appropriate fire extinguishers for different types of fires Types of fires: Class A: e.g. ordinary solid combustibles, such as wood, paper, cloth, plastic, charcoal, etc.; Class B: flammable liquids and gases, such as gasoline, propane, diesel fuel, tar, cooking oil, and similar substances; Class C: e.g. electrical equipment such as appliances, wiring, breaker panels, etc. (These categories of fires become Class A, B, and D fires when the electrical equipment that initiated the fire is no l 	1	3	-	-
PC12. exhibit rescue and first-aid techniques in case of fire or electrocution	1	3	-	-
<i>Follow emergencies, rescue and first-aid procedures</i>	6	13	-	-
PC13. administer appropriate first aid to victims in case of bleeding, burns, choking, electric shock, poisoning etc.	1	3	-	-
PC14. administer first aid to victims in case of a heart attack or cardiac arrest due to electric shock,	1	2	-	-
PC15. participate regularly in emergency procedures such as raising alarm, safe/efficient, evacuation, correct means of taking shelter and escaping, correct assembly point, roll call, correct return to work	2	4	-	-
PC16. use correct method to move injured people and others during an emergency	2	4	-	-
<i>Effective waste management/recycling practices</i>	5	12	-	-
PC17. identify recyclable and non-recyclable, and hazardous waste generated	1	3	-	-
PC18. segregate waste into different categories	1	2	-	-
PC19. ensure disposal of non-recyclable waste appropriately	1	2	-	-
PC20. deposit non-recyclable and reusable material at identified location	1	3	-	-



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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC21. follow processes specified for disposal of hazardous waste	1	2	-	-
NOS Total	35	65	-	-



Qualification Pack

National Occupational Standards (NOS) Parameters

NOS Code	ELE/N1002
NOS Name	Apply health and safety practices at the workplace
Sector	Electronics
Sub-Sector	Generic
Occupation	Generic - Health Safety
NSQF Level	4
Credits	TBD
Version	3.0
Last Reviewed Date	24/02/2022
Next Review Date	24/02/2025
NSQC Clearance Date	24/02/2022



Qualification Pack

DGT/VSQ/N0102: Employability Skills (60 Hours)

Description

This unit is about employability skills, Constitutional values, becoming a professional in the 21st Century, digital, financial, and legal literacy, diversity and Inclusion, English and communication skills, customer service, entrepreneurship, and apprenticeship, getting ready for jobs and career development.

Scope

The scope covers the following :

- Introduction to Employability Skills
- Constitutional values - Citizenship
- Becoming a Professional in the 21st Century
- Basic English Skills
- Career Development & Goal Setting
- Communication Skills
- Diversity & Inclusion
- Financial and Legal Literacy
- Essential Digital Skills
- Entrepreneurship
- Customer Service
- Getting ready for Apprenticeship & Jobs

Elements and Performance Criteria

Introduction to Employability Skills

To be competent, the user/individual on the job must be able to:

- PC1.** identify employability skills required for jobs in various industries
- PC2.** identify and explore learning and employability portals

Constitutional values - Citizenship

To be competent, the user/individual on the job must be able to:

- PC3.** recognize the significance of constitutional values, including civic rights and duties, citizenship, responsibility towards society etc. and personal values and ethics such as honesty, integrity, caring and respecting others, etc.
- PC4.** follow environmentally sustainable practices

Becoming a Professional in the 21st Century

To be competent, the user/individual on the job must be able to:

- PC5.** recognize the significance of 21st Century Skills for employment
- PC6.** practice the 21st Century Skills such as Self-Awareness, Behaviour Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn for continuous learning etc. in personal and professional life

Basic English Skills

To be competent, the user/individual on the job must be able to:

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- PC7.** use basic English for everyday conversation in different contexts, in person and over the telephone
- PC8.** read and understand routine information, notes, instructions, mails, letters etc. written in English
- PC9.** write short messages, notes, letters, e-mails etc. in English

Career Development & Goal Setting

To be competent, the user/individual on the job must be able to:

- PC10.** understand the difference between job and career
- PC11.** prepare a career development plan with short- and long-term goals, based on aptitude

Communication Skills

To be competent, the user/individual on the job must be able to:

- PC12.** follow verbal and non-verbal communication etiquette and active listening techniques in various settings
- PC13.** work collaboratively with others in a team

Diversity & Inclusion

To be competent, the user/individual on the job must be able to:

- PC14.** communicate and behave appropriately with all genders and PwD
- PC15.** escalate any issues related to sexual harassment at workplace according to POSH Act

Financial and Legal Literacy

To be competent, the user/individual on the job must be able to:

- PC16.** select financial institutions, products and services as per requirement
- PC17.** carry out offline and online financial transactions, safely and securely
- PC18.** identify common components of salary and compute income, expenses, taxes, investments etc
- PC19.** identify relevant rights and laws and use legal aids to fight against legal exploitation

Essential Digital Skills

To be competent, the user/individual on the job must be able to:

- PC20.** operate digital devices and carry out basic internet operations securely and safely
- PC21.** use e- mail and social media platforms and virtual collaboration tools to work effectively
- PC22.** use basic features of word processor, spreadsheets, and presentations

Entrepreneurship

To be competent, the user/individual on the job must be able to:

- PC23.** identify different types of Entrepreneurship and Enterprises and assess opportunities for potential business through research
- PC24.** develop a business plan and a work model, considering the 4Ps of Marketing Product, Price, Place and Promotion
- PC25.** identify sources of funding, anticipate, and mitigate any financial/ legal hurdles for the potential business opportunity

Customer Service

To be competent, the user/individual on the job must be able to:

- PC26.** identify different types of customers
- PC27.** identify and respond to customer requests and needs in a professional manner.

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PC28. follow appropriate hygiene and grooming standards

Getting ready for apprenticeship & Jobs

To be competent, the user/individual on the job must be able to:

PC29. create a professional Curriculum vitae (Résumé)

PC30. search for suitable jobs using reliable offline and online sources such as Employment exchange, recruitment agencies, newspapers etc. and job portals, respectively

PC31. apply to identified job openings using offline /online methods as per requirement

PC32. answer questions politely, with clarity and confidence, during recruitment and selection

PC33. identify apprenticeship opportunities and register for it as per guidelines and requirements

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. need for employability skills and different learning and employability related portals

KU2. various constitutional and personal values

KU3. different environmentally sustainable practices and their importance

KU4. Twenty first (21st) century skills and their importance

KU5. how to use English language for effective verbal (face to face and telephonic) and written communication in formal and informal set up

KU6. importance of career development and setting long- and short-term goals

KU7. about effective communication

KU8. POSH Act

KU9. Gender sensitivity and inclusivity

KU10. different types of financial institutes, products, and services

KU11. how to compute income and expenditure

KU12. importance of maintaining safety and security in offline and online financial transactions

KU13. different legal rights and laws

KU14. different types of digital devices and the procedure to operate them safely and securely

KU15. how to create and operate an e- mail account and use applications such as word processors, spreadsheets etc.

KU16. how to identify business opportunities

KU17. types and needs of customers

KU18. how to apply for a job and prepare for an interview

KU19. apprenticeship scheme and the process of registering on apprenticeship portal

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. read and write different types of documents/instructions/correspondence

GS2. communicate effectively using appropriate language in formal and informal settings



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- GS3.** behave politely and appropriately with all
- GS4.** how to work in a virtual mode
- GS5.** perform calculations efficiently
- GS6.** solve problems effectively
- GS7.** pay attention to details
- GS8.** manage time efficiently
- GS9.** maintain hygiene and sanitization to avoid infection

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Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Introduction to Employability Skills</i>	1	1	-	-
PC1. identify employability skills required for jobs in various industries	-	-	-	-
PC2. identify and explore learning and employability portals	-	-	-	-
<i>Constitutional values - Citizenship</i>	1	1	-	-
PC3. recognize the significance of constitutional values, including civic rights and duties, citizenship, responsibility towards society etc. and personal values and ethics such as honesty, integrity, caring and respecting others, etc.	-	-	-	-
PC4. follow environmentally sustainable practices	-	-	-	-
<i>Becoming a Professional in the 21st Century</i>	2	4	-	-
PC5. recognize the significance of 21st Century Skills for employment	-	-	-	-
PC6. practice the 21st Century Skills such as Self-Awareness, Behaviour Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn for continuous learning etc. in personal and professional life	-	-	-	-
<i>Basic English Skills</i>	2	3	-	-
PC7. use basic English for everyday conversation in different contexts, in person and over the telephone	-	-	-	-
PC8. read and understand routine information, notes, instructions, mails, letters etc. written in English	-	-	-	-
PC9. write short messages, notes, letters, e-mails etc. in English	-	-	-	-
<i>Career Development & Goal Setting</i>	1	2	-	-

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC10. understand the difference between job and career	-	-	-	-
PC11. prepare a career development plan with short- and long-term goals, based on aptitude	-	-	-	-
<i>Communication Skills</i>	2	2	-	-
PC12. follow verbal and non-verbal communication etiquette and active listening techniques in various settings	-	-	-	-
PC13. work collaboratively with others in a team	-	-	-	-
<i>Diversity & Inclusion</i>	1	2	-	-
PC14. communicate and behave appropriately with all genders and PwD	-	-	-	-
PC15. escalate any issues related to sexual harassment at workplace according to POSH Act	-	-	-	-
<i>Financial and Legal Literacy</i>	2	3	-	-
PC16. select financial institutions, products and services as per requirement	-	-	-	-
PC17. carry out offline and online financial transactions, safely and securely	-	-	-	-
PC18. identify common components of salary and compute income, expenses, taxes, investments etc	-	-	-	-
PC19. identify relevant rights and laws and use legal aids to fight against legal exploitation	-	-	-	-
<i>Essential Digital Skills</i>	3	4	-	-
PC20. operate digital devices and carry out basic internet operations securely and safely	-	-	-	-
PC21. use e- mail and social media platforms and virtual collaboration tools to work effectively	-	-	-	-
PC22. use basic features of word processor, spreadsheets, and presentations	-	-	-	-

Qualification Pack

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Entrepreneurship</i>	2	3	-	-
PC23. identify different types of Entrepreneurship and Enterprises and assess opportunities for potential business through research	-	-	-	-
PC24. develop a business plan and a work model, considering the 4Ps of Marketing Product, Price, Place and Promotion	-	-	-	-
PC25. identify sources of funding, anticipate, and mitigate any financial/ legal hurdles for the potential business opportunity	-	-	-	-
<i>Customer Service</i>	1	2	-	-
PC26. identify different types of customers	-	-	-	-
PC27. identify and respond to customer requests and needs in a professional manner.	-	-	-	-
PC28. follow appropriate hygiene and grooming standards	-	-	-	-
<i>Getting ready for apprenticeship & Jobs</i>	2	3	-	-
PC29. create a professional Curriculum vitae (Résumé)	-	-	-	-
PC30. search for suitable jobs using reliable offline and online sources such as Employment exchange, recruitment agencies, newspapers etc. and job portals, respectively	-	-	-	-
PC31. apply to identified job openings using offline /online methods as per requirement	-	-	-	-
PC32. answer questions politely, with clarity and confidence, during recruitment and selection	-	-	-	-
PC33. identify apprenticeship opportunities and register for it as per guidelines and requirements	-	-	-	-
NOS Total	20	30	-	-

Qualification Pack

National Occupational Standards (NOS) Parameters

NOS Code	DGT/VSQ/N0102
NOS Name	Employability Skills (60 Hours)
Sector	Cross Sectoral
Sub-Sector	Professional Skills
Occupation	Employability
NSQF Level	4
Credits	2
Version	1.0
Last Reviewed Date	30/11/2023
Next Review Date	30/11/2026
NSQC Clearance Date	30/11/2023

Assessment Guidelines and Assessment Weightage

Assessment Guidelines

1. Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Element/ 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 Element/ 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, and where applicable, on the selected elective/option NOS/set of NOS.
4. Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training center (as per assessment criteria below).
5. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/ training center based on these criteria.
6. To pass the Qualification Pack assessment, every trainee should score the Recommended Pass % aggregate for the QP.
7. In case of unsuccessful completion, the trainee may seek reassessment on the Qualification Pack.

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Minimum Aggregate Passing % at QP Level : 70

(Please note: Every Trainee should score a minimum aggregate passing percentage as specified above, to successfully clear the Qualification Pack assessment.)

Assessment Weightage

Compulsory NOS

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
ELE/N5313.Manage SMT machines	40	50	-	10	100	35
ELE/N5314.Manage production process, material quality and machines	40	50	-	10	100	35
ELE/N1002.Apply health and safety practices at the workplace	35	65	-	-	100	15
DGT/VSQ/N0102.Employability Skills (60 Hours)	20	30	-	-	50	15
Total	135	195	-	20	350	100



Qualification Pack

Acronyms

NOS	National Occupational Standard(s)
NSQF	National Skills Qualifications Framework
QP	Qualifications Pack
TVET	Technical and Vocational Education and Training

Qualification Pack

Glossary

Sector	Sector is a conglomeration of different business operations having similar business and interests. It may also be defined as a distinct subset of the economy whose components share similar characteristics and interests.
Sub-sector	Sub-sector is derived from a further breakdown based on the characteristics and interests of its components.
Occupation	Occupation is a set of job roles, which perform similar/ related set of functions in an industry.
Job role	Job role defines a unique set of functions that together form a unique employment opportunity in an organisation.
Occupational Standards (OS)	OS specify the standards of performance an individual must achieve when carrying out a function in the workplace, together with the Knowledge and Understanding (KU) they need to meet that standard consistently. Occupational Standards are applicable both in the Indian and global contexts.
Performance Criteria (PC)	Performance Criteria (PC) are statements that together specify the standard of performance required when carrying out a task.
National Occupational Standards (NOS)	NOS are occupational standards which apply uniquely in the Indian context.
Qualifications Pack (QP)	QP comprises the set of OS, together with the educational, training and other criteria required to perform a job role. A QP is assigned a unique qualifications pack code.
Unit Code	Unit code is a unique identifier for an Occupational Standard, which is denoted by an 'N'
Unit Title	Unit title gives a clear overall statement about what the incumbent should be able to do.
Description	Description gives a short summary of the unit content. This would be helpful to anyone searching on a database to verify that this is the appropriate OS they are looking for.
Scope	Scope is a set of statements specifying the range of variables that an individual may have to deal with in carrying out the function which have a critical impact on quality of performance required.

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Knowledge and Understanding (KU)	Knowledge and Understanding (KU) are statements which together specify the technical, generic, professional and organisational specific knowledge that an individual needs in order to perform to the required standard.
Organisational Context	Organisational context includes the way the organisation is structured and how it operates, including the extent of operative knowledge managers have of their relevant areas of responsibility.
Technical Knowledge	Technical knowledge is the specific knowledge needed to accomplish specific designated responsibilities.
Core Skills/ Generic Skills (GS)	Core skills or Generic Skills (GS) are a group of skills that are the key to learning and working in today's world. These skills are typically needed in any work environment in today's world. These skills are typically needed in any work environment. In the context of the OS, these include communication related skills that are applicable to most job roles.
Electives	Electives are NOS/set of NOS that are identified by the sector as contributive to specialization in a job role. There may be multiple electives within a QP for each specialized job role. Trainees must select at least one elective for the successful completion of a QP with Electives.
Options	Options are NOS/set of NOS that are identified by the sector as additional skills. There may be multiple options within a QP. It is not mandatory to select any of the options to complete a QP with Options.