BANGLADESH TECHNICAL EDUCATION BOARD

Light Engineering Sector
Industry Skills Council
Bangladesh

NATIONAL COMPETENCY STANDARDS

for

CONSUMER ELECTRONICS

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INTRODUCTION:

These Competency Standards were developed by the Technical Sub Committee (TSC) that was established under **The Project for Enhancing the Vocational Training Program of TTC Chittagong** which is implemented by KOICA (Korea International Cooperation Agency) funded by the Government of Korea. The rules of Skill Development Policy are maintained to develop the standards. The competency standards are the foundation on which new competency based curriculum will be developed that responds better to the needs of industry for skilled workers. The members of the TSC are primarily from industry but with representatives from TTC Chittagong. Persons who will successfully complete the new TVET programs based on these competency standards will receive a qualification in the new National Technical and Vocational Qualification Framework (NTVQF).

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Endorsed by

Industry Skills Council / Industry Sector Committee.

Date:

Bangladesh Technical Education Board (BTEB)

Date:

Proposed Bangladesh NTVQF with Job Classifications

NTVQF Levels	**Education Sectors**			**Job Classification**
	Pre Vocation Education	Vocational Education	Technical Education	
NTVQF 6			Diploma in Engineering or Equivalent	Middle level Manager/ Sub Assistant Engineer etc.
NTVQF 5		National Skill Certificate 5 (NSC 5)		High Skilled Worker/Supervisor
NTVQF 4		National Skill Certificate 4 (NSC 4)		Skilled Worker
NTVQF 3		National Skill Certificate 3 (NSC 3)		Semi Skilled Worker
NTVQF 2		National Skill Certificate 2 (NSC 2)		Medium Skilled Worker
NTVQF 1		National Skill Certificate 1 (NSC 1)		Basic Skilled Worker
Pre-Voc2	National Pre-Vocation Certificate in NPVC 2			Pre-Vocation Trainee
Pre-Voc1	National Pre-Vocation Certificate in NPVC 1			Pre-Vocation Trainee

NTVQF level Descriptors

NTVQF level	Knowledge	Skill	Responsibility	Job Class
6	Comprehensive actual and theoretical knowledge within a specific study area with an awareness of the limits of that knowledge	Specialized and restricted range of cognitive and practical skills required to provide leadership in the development of creative solutions to defined problems	Mange a team or teams in workplace activities where there is unpredictable change . Identify and design learning programs to develop performance of team members.	Supervisor/Middle Level Manager/Sub Assistant Engr. Etc.
5	Very broad knowledge of the underlying. Concepts, principles, and processes in a specific study area	Very broad range of cognitive and practical skills required to generate solutions to specific problems in one or more study areas.	Take overall responsibility for completion of tasks in work or study. Apply past experiences in solving similar problems	Highly Skilled Worker/ Supervisor.
4	Very broad knowledge of the underlying. Concepts, principles, and processes in a specific study area	Range of cognitive and practical skills required to accomplish tasks and solve problems by selecting and applying the full range of methods, tools, materials and information.	Take responsibility, within reason, for completion of tasks in work or study. Apply past experiences in solving similar problems	Skilled Worker
3	Moderately broad knowledge in a specific study area.	Basic cognitive and practical skills required to use relevant information in order to carry out tasks and to solve routine problems using simple rules and tools.	Work or study under supervision with some autonomy	Semi- Skilled Worker.
2	Basic underpinning knowledge in a specific study area	Basic skills required to carry out simple tasks	Work or study under indirect supervision in a structured context.	Medium Skilled Worker
1	Elementary understanding of the underpinning knowledge in a specific study area	Limited range of skills required to carry out simple tasks	Work or study under direct supervision in a structured context	Basic Skilled Worker
Pre-Voc 2	Limited general knowledge	Very limited range of skills and use of tools required to carry out simple tasks	Work or study under direct supervision in a structured context	Pre-Vocation Trainee
Pre-Voc 1	Extremely limited general knowledge	Minimal range of skills required to carry out simple tasks	Simple work or study exercises, under direct supervision in a clear, well defined structured context	Pre-Vocation Trainee

National Competency Standards
For
Consumer Electronics Technician

Sl. No.	Unit Code& Title		NTVQF Level	Nominal Hours
Generic -Compulsory (5 UoCs required)				**200**
1	GN1001A1	Use basic mathematical concepts	1	40
2	GN 1002A1	Apply OSH practices in the workplace	1	30
3	GN2003A1	Use English in the workplace	2	70
4	GN2004A1	Operate in a self-directed team	2	30
5	GN2005A1	Present and apply workplace information	2	30
Sector Specific - Compulsory (5 UoCs required)				**150**
6.	LESS1006A1	Work in the Light Engineering sector (Consumer Electronics)	1	25
7.	LESS1007A1	Interpret drawing and specifications	1	30
8.	LESS1008A1	Use measuring instruments	1	30
9.	LESS1009A1	Use hand tools and power tools	1	35
10.	LESS3010A1	Apply quality systems and procedures	3	30
Occupation Specific - Compulsory (11 UoCs required)				**620**
11.	LECONELE1011A1	Perform Testing of Electronic components and measure voltage /current.	1	20
12.	LECONELE1012A1	Terminate and connect Electrical Wiring and Electronics Circuits.	1	30
13.	LECONELE1013A1	Assemble and Disassemble Consumer Electronic appliances	1	40
14.	LECONELE1014A1	Maintain and Service Audio/ Video products and system	1	60
15.	LECONELE1015A1	Test Function and quality of assembled electronic appliances	1	50
16.	LECONELE1016A1	Maintain and service electrical and electronics-controlled domestic Appliances	2	60
17.	LECONELE2017A1	Down load and use software	2	30
18.	LECONELE2018A1	Maintain and service Cellular Phones	2	80
19.	LECONELE3019A1	Use basic control System.	3	90
20.	LECONELE3020A1	Maintain and service Electronic-controlled office equipment	3	100
21.	LECONELE3021A1	Commission consumer electronic appliances	3	60
Total Nominal Hours				**970**

Course Structure
For

NATIONAL CERTIFICATE IN CONSUMER ELECTRONICS (NTVQF LEVEL 2)

S. No.	Unit Code and Title		UoC Level	Nominal Duration (Hours)
Generic (3 UoCs required)				**130**
1.	GN2003A1	Use English in the workplace	2	70
2.	GN2004A1	Operate in a self-directed team	2	30
3	GN2005A1	Present and apply workplace information	2	30
Occupation Specific - Compulsory (3 UoCs required)				**170**
5	LECONELE2016A1	Maintain and service electrical and electronics-controlled domestic appliances	2	60
6	LECONELE2017A1	Down load and use software	2	30
7	LECONELE2018A1	Maintain and service cellular phones	2	80
		Total Nominal Learning Hours		**300**

LIST OF ABBREVIATIONS USED IN THIS COMPETENCY STANDARD

MoEWOE	- Ministry of Expatriates' Welfare and Overseas Employment
BMET	- Bureau of Manpower Employment and Training
BTEB	- Bangladesh Technical Education Board
ISC	- Industry Skills Council
NPVC	- National Pre-Vocation Certificate
NTVQF	- National Technical and Vocational Qualification Framework
SSDC	- Standards and Curriculum Development Committee
TVET	- Technical Vocational Education and Training
UoC	- Unit of Competency
KOICA	- Korea International Cooperation Agency
CD	- Compact Disk
IT	- Information Technology
LCD	- Liquid Crystal Display
MS	- Microsoft
OSH	- Occupational Safety and Health
PPE	- Personal Protective Equipment
SATA	- Serial Advanced Technology Attachment

GENERIC UNITS

National Technical and Vocational Qualification Framework for Bangladesh

Unit of Competency

UNIT CODE AND TITLE	**GN1001A1 - Use Basic Mathematical Concept**
NOMINAL HOURS	**40**
UNIT DESCRIPTOR	This requires the knowledge and skill to apply mathematical methods such as addition, subtraction, multiplication, division etc., in routine task of an organization.
ELEMENTS OF COMPETENCY	**PERFORMANCE CRITERIA** ***Italicizied*** terms are elaborated in the range of variables 1.1
1. Identify Calculation requirements in the workplace	***Calculation*** requirements are identified from workplace information
2. Select appropriate mathematical methods for the calculation	2.1 Appropriate ***method*** is selected to carry out the calculation.
3. Use basic mathematical concepts to calculate workplace calculation.	3.1 Calculations are completed using appropriate method such as addition, subtraction, multiplication and division
Range of Variables	
Variable	**Range** (May include but not limited to):
1. Equipment and Tools	□ Calculator □ Computer with office software
2. Calculations	addition, subtraction, division, multiplication, ratio on any types of real values, such as whole number, fractional number, percentage, number with exponents
3. Application	□ Measurement □ Volume □ Weight □ Mass □ Density □ Percentage □ Length / Breadth / Thickness □ Capacity □ Time □ Temperature □ Budget, Pay/ Wages, Leave entitlements □ Material usage □ Speed □ Costing

4. Workplace Information	Project documents, graph, chart, tables, spread sheet, item price quotation, equipment manual
5. Budget	Budget of consumables, calculation for software components, hardware equipment's, maintenance budget of a set-up, cost estimation etc
6. Methods	Methods are basic mathematical function such as addition, subtraction, multiplication and division but not limited to these.

EVIDENCE GUIDE	
1. Critical aspects of competency	Assessment requires evidence that the candidate: • Added and subtracted different types of numbers • Multiplied and divided different types of numbers • Used Calculator • Applied mathematical concept on: ➢ Volume ➢ Weight ➢ Mass ➢ Density ➢ Percentage ➢ Length / Breadth / Thickness ➢ Capacity ➢ Time ➢ Temperature ➢ Budget, Pay/ Wages, Leave entitlements ➢ Material usage ➢ Speed ➢ Costing
2. Underpinning Knowledge	2.1 Calculation requirements in the workplace 2.2 Select appropriate mathematical methods 2.3 Equipment and Tools 2.4 Mathematical language, symbols and terminology 2.5 Application and units 2.6 Workplace information 2.7 Using arithmetic processes to find solutions to simple mathematical problems 2.8 Interaction skills (i.e., teamwork, mentoring, leadership, networking, interpersonal skills, etc.) 2.9 Job roles, responsibilities and compliances
3. Underpinning Skills	3.1 Ability to calculation requirements are identified from workplace information. 3.2 Ability to select appropriate mathematical methods such as: basic mathematical concepts include (addition, subtraction, multiplication and division) etc. 3.3 Ability to use technology such as: scientific calculators,

	spread sheets and/or graphics calculators etc. 3.4 Ability to use mathematical language, symbols and terminology 3.5 Using different types of units such as (Mass- kg, length- meter etc) and application may include but limited to (Measurement, Volume, weight, density, percentage etc) 3.6 Ability to include workplace information (project documents, graph, chart, tables, spread sheet, item price quotation, equipment manual) 3.7 Ability to use arithmetic processes to find solutions to simple mathematical problems 3.8 Work effectively with others - Provide leadership in a variety of situations. - Deal with individual and/or group conflict 3.9 Ability to apply in the workplace.
4. Required Attitude	4.1 Commitment to occupational health and safety 4.2 Environmental concerns 4.3 Eagerness to learn 4.4 Tidiness and timeliness 4.5 Respect of peers and seniors in workplace
5. Resource Implications	The following resources must be provided: 5.1 Work place 5.2 Materials relevant to the proposed activity 5.3 All tools, equipment, material and documentation required. 5.4 Relevant specifications or work instructions
6 .Methods of Assessment	Competency must be assessed through: 6.1 Oral Questioning 6.2 Assignment 6.3 Demonstration 6.4 Written Exam.
7 Context for Assessment	For certification competency should be assessed individually in the actual work place or simulated environment after completion of the module.

Accreditation Requirements

Training Providers must be accredited by Bangladesh Technical Education Board (BTEB), the national quality assurance body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of any national qualification. Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by BTEB.

National Technical and Vocational Qualification Framework for Bangladesh
Unit of Competency

UNIT CODE AND TITLE	**GN1002A1 - Apply OSH practices in the workplace**
NOMINAL HOURS	**30**
UNIT DESCRIPTOR	This unit covers the skills and knowledge required to identify and apply OSH in the workplace.
ELEMENTS OF COMPETENCY	**PERFORMANCE CRITERIA** ***Italicizied*** terms are elaborated in the range of variables
1.Identify, control and report OSH hazards	1.1 Immediate work area is routinely checked for OSH hazards prior to commencing and during work. 1.2 ***Hazards*** and unacceptable performance are identified and corrective action is taken within the level of responsibility. 1.3 OSH hazards and incidents are reported to appropriate personnel according to workplace procedures. 1.4 Safety Signs and symbols are identified and followed.
2.Conduct work safety	2.1 Apply OSH practices in the workplace. 2.2 Appropriate ***personal protective equipment*** (PPE) is selected and worn.
3.Follow emergency response procedures	3.1 Emergency situations are identified and reported according to workplace reporting requirements. 3.2 Emergency procedures are followed as appropriate to the nature of the emergency and according to workplace procedures. 3.3 Workplace procedures for dealing with accidents, fires and emergencies are followed whenever necessary within scope of responsibilities.
4. Maintain and improve health and safety in the work place	4.1 Risks are identified and appropriate control measures are implemented in the work area. 4.2 Recommendations arising from risk assessments are implemented with in level of responsibility. 4.3 Opportunities for improving OSH performance are identified and raised with relevant personnel. 4.4 Maintain safety records according to company policies.

Range of Variables	
Variable	**Range** (May include but not limited to):
1.Work is carried out in accordance with company procedures, regulatory and licensing requirements.	□ Legislative requirements and industrial awards and agreements. Legislative requirements of occupational health and safety Acts and regulations, including regulations and codes of practice relating to hazards present in the workplace. They also include general duty of care under occupational health and safety legislation and common law
2.Company procedures	□ Job-related Standard Operating Procedures (SOPs) and OSH-specific procedures. Examples of OSH procedures include consultation and participation, emergency response, response to specific hazards, incident investigation, risk assessment, reporting arrangements and issue resolution procedures
3.Workplace information	□ OSH system and related documentation including policies and procedures, Standard Operating Procedures (SOPs), information on hazards and the work process, hazard alerts, safety signs and symbols, labels, Material Safety Data Sheets (MSDSs) and manufacturers' advice.
4.Hazards	□ OSH incidents include near misses, injuries, illnesses and property damage, noise, handling hazardous substances, other hazards □ Working with and near moving equipment/load shifting equipment □ Broken or damaged equipment or materials
5.Personal Protective equipment	□ Goggles, ear muffs, ear plugs, Gloves, Clothing, Apron, Helmet, Boots
6.Equipment	□ Production machinery □ Safety equipment □ Emergency equipment □ Tools of the trade

EVIDENCE GUIDE	
1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Worn Personal Protective Equipment 1.2 Identified hazards 1.3 Took corrective action of different hazards 1.4 Took corrective action for emergency procedure 1.5 Reported Emergency situation to the supervisor/Manger 1.6 Satisfied the requirements mentioned in the Performance Criteria and Range of Variables
2. Underpinning Knowledge	2.1 OHS Workplace Policies and Procedures 2.2 Work Safety Procedures

	2.3 Emergency Procedures 2.4 Types of Hazards (Biological, Chemical and Physical) and Their Effects 2.5 PPE types and uses 2.6 Personal Hygiene Practices 2.7 OHS Awareness 2.8 Steps of Hazard Identification 2.9 Principles of Hazards control 2.10 Employer's Role 2.11 Supervisor's Responsibilities 2.12 Maintain Hazards inspection checklist
3. Underpinning Skills	3.1 Identifying OHS policies and procedures 3.2 Following personal work safety practices 3.3 Reporting hazards and risks 3.4 Responding to emergency procedures 3.5 Maintaining physical well-being in the workplace 3.6 Identifying hazards 3.7 Assessing associated risks 3.8 Identify tools and equipment related to OSH. 3.9 Use the appropriate PPE. 3.10 Controlling hazard 3.11 Emergency situation 3.12 Fire and emergency procedures 3.13 Improving OSH performance.
4. Required Attitude	4.1 Commitment to occupational health and safety 4.2 Environmental concerns 4.3 Eagerness to learn 4.4 Tidiness and timeliness 4.5 Respect of peers and seniors in workplace
5. Resource Implications	The following resources must be provided: 5.1 Work place 5.2 Tools and equipment appropriate to the work place 5.3 Materials relevant to the proposed activity 5.4 All tools, equipment, material and documentation required. 5.5 Relevant specifications or work instructions.
6 .Methods of Assessment	Competency must be assessed through: 6.1 Oral Questioning 6.2 Assignment 6.3 Demonstration 6.4 Written Exam.
7 Context for Assessment	For certification competency should be assessed individually in the actual work place or simulated environment after completion of the module.

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National Technical and Vocational Qualification Framework for Bangladesh
Unit of Competency

UNIT CODE AND TITLE	**GN2003A1: Use English in the workplace**
NOMINAL HOURS	**70**
UNIT DESCRIPTOR	This unit specifies the competency required to able to read, write and understand basic English in the workplace.
ELEMENTS OF COMPETENCY	**PERFORMANCE CRITERIA** ***Italicizied*** terms are elaborated in the range of variables
1. Read and understand workplace documents in English	1.1 Workplace a documents are read and understood. 1.2 Visual information is interpreted.
2. Write simple routine workplace documents in English	2.1 Simple ***routine workplace*** documents are prepared using key words, phrases, simple sentences and ***visual aids*** where appropriate. 2.2 Key information is written in the appropriate places in standard forms.
3. Listen to conversation in English	3.1 Active listening in English language is demonstrated to the required workplace standard.
4. Perform conversation in English	4.1 Conversation is performed in English with peers, customers and management to the required workplace standard
Range of Variables	
Variable	**Range** (May include but not limited to):
1. Routine and non-routine workplace documents required to be read and understood	Schedules and itineraries Agenda Simple reports such as progress and incident reports Job sheets Operational manuals Brochures and promotional material Visual and graphic materials Standards OSH information
2. Visual information	Signs maps diagrams forms labels graphs charts

EVIDENCE GUIDE	
1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Spoke English with workplace fellows 1.2 Made reports of workplace documents in English .
2. Underpinning Knowledge	2.1 Read workplace documents in English 2.2 Write simple routine workplace documents in English 2.3 Listen to conversation in English 2.4 Perform conversation in English 2.5 Interaction skills (i.e., teamwork, interpersonal skills, etc.) 2.6 Job roles, responsibilities and compliances
3. Underpinning Skills	3.1 Ability to read and understand workplace documents in English by using appropriate vocabulary and grammar, standard spelling and punctuation. 3.2 Ability to write simple routine workplace documents in English such as: Schedules and agenda, job sheets, operational manuals and brochures and promotional material. 3.3 Ability in active listening in English language is demonstrated to the required workplace standard. 3.4 Ability to perform conversation in English with peers, customers and management to the required workplace standard. 3.5 Work effectively with others. a. listening and questioning skills b. ability to follow simple directions
4.Required Attitude	4.1 Commitment to occupational health and safety 4.2 Environmental concerns 4.3 Eagerness to learn 4.4 Tidiness and timeliness 4.5 Respect of peers and seniors in workplace
5. Resource Implications	The following resources must be provided: 5.1 Work place Procedure 5.2 Materials relevant to the proposed activity 5.3 All tools, equipment, material and documentation required. 5.4 Relevant specifications or work instructions
6 .Methods of Assessment	Competency must be assessed through: 6.1 Oral Questioning 6.2 Assignment 6.3 Demonstration 6.4 Written Exam.
7. Context for Assessment	For certification competency should be assessed individually in the actual work place or simulated environment after completion of the module.

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National Technical and Vocational Qualification Framework for Bangladesh

Unit of Competency

UNIT CODE AND TITLE	**GN2004A1 - Operate in a self-directed team**
NOMINAL HOURS	**30**
UNIT DESCRIPTOR	This unit specifies the skills, knowledge and attitude to communicate and work with in a team in an interactive work environment as per the workplace standard.
ELEMENTS OF COMPETENCY	**PERFORMANCE CRITERIA** ***Italicizied*** terms are elaborated in the range of variables
1. Identify team goals and processes	1.1 Team goals and processes are identified. 1.2 Roles and responsibilities of team members are identified 1.3 Relationships within team and with other work areas identified
2. Communicate and cooperate with team members	2.1 Effective interpersonal skills are used to interact with team members and to contribute to activities and objectives. 2.2 Formal and informal forms of communication are used effectively to support team achievement. 2.3 Diversity is respected and valued in team functioning. 2.4 Views and opinions of other team members are understood and reflected accurately. 2.5 Workplace terminology is used correctly to assist communication.
3. Work as a team member	3.1 Duties, responsibilities, authorities, objectives and task requirements are identified and clarified with team 3.2 Tasks are performed in accordance with organizational and team requirements, specifications and workplace procedures. 3.3 Team members support other members as required to ensure team achieves goals and requirements. 3.4 Agreed reporting lines are followed using standard operating procedure
4. Solve problems as a team member	4.1 Current and potential problems faced by team are identified. 4.2 Procedures for avoiding and managing problems are identified. 4.3 ***Problems*** are solved effectively and in a manner which supports the team

Range of Variables	
Variable	**Range** (May include but not limited to):
1.Team problem-solving activities including:	□ Identifying the problem □ Consider solutions □ Action □ Follow-up.
2.Collaborative decision-making processes:	□ Consultation □ Conciliation □ Negotiation □ Principles of equity and fairness.
3. An awareness of:	□ Organization/company's code of conduct, complaints handling/grievance policies and procedures

EVIDENCE GUIDE	
1. Critical aspects of Competency	Assessment requires evidence that the candidate: 1.1 Work effectively within a team 1.2 Dealt with a range of communication/information at one time 1.3 Made constructive contributions in workplace issues 1.4 Sought workplace issues effectively 1.5 Responded to workplace issues promptly 1.6 Presented information clearly and effectively in written form 1.7 Used appropriate sources of information 1.8 Asked appropriate questions 1.9 Provided accurate information
2. Underpinning knowledge	2.1 Organization requirements for written and electronic communication methods 2.2 Effective verbal communication methods
3. Underpinning Skills	3.1 Organize information 3.2 Understand and convey intended meaning 3.3 Participate in variety of workplace discussions 3.4 Comply with organization requirements for the use of written and electronic communication methods
4. Required Attitude	4.1 Commitment to occupational health and safety 4.2 Environmental concerns 4.3 Eagerness to learn 4.4 Tidiness and timeliness 4.5 Respect for rights of peers and seniors in workplace
5. Resource Implications	The following resources must be provided: 5.1 Work place 5.2 Materials relevant to the proposed activity 5.3 All tools, equipment, material and documentation required.. 5.4 Relevant specifications or work instructions

6. Methods of Assessment	Competency must be assessed through: 6.1 Oral Questioning 6.2 Assignment 6.3 Demonstration 6.4 Written Exam.
7. Context for Assessment	For certification competency should be assessed individually in the actual work place or simulated environment after completion of the module.

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National Technical and Vocational Qualification Framework for Bangladesh

Unit of Competency

UNIT CODE AND TITLE	**GN2005A1 - Present and apply workplace information**
NOMINAL HOURS	**30**
UNIT DESCRIPTOR	This unit covers the skills, knowledge and attitude to communicate and deliver up-to-date information to all in an interactive work environment as per workplace standard.
ELEMENTS OF COMPETENCY	**PERFORMANCE CRITERIA** ***Italicizied*** terms are elaborated in the range of variables
1.Identify information requirements	1.1 Information requirements in the workplace are identified
2.Process Data	2.1 Data is collected and correlated as per prescribed method. 2.2 Relevant data is used as references in accordance with the objectives of the program. 2.3 Information is applied according to the requirements.
3. Analysis, interpret and organize information	3.1 Collected information is ***analyzed***, interpret and organize as required for workplace.
4. Apply and present workplace information	4.1 Findings and recommendations are summarized and presented in a user-friendly manner. 4.2 Draft report/forms are prepared based on standard format. 4.3 Graphs and other visual presentations are prepared to highlight analysis/interpretation of information. 4.4 ***Reports/forms*** are submitted and distributed to relevant departments/wings/persons
Range of Variables	
Variable	**Range** (May include but not limited to):
1. Source of information	Source of information Daily job instructions, specifications, standard operating procedures, charts, lists, documents, computer data, drawings, sketches, tables, technical manuals and/or charts, Surveys, Interviews, Front-end analysis, Functional analysis
2.Forms	Forms may include but not limited to: Questionnaires, Profile, Accident/incident report form, work order, purchase order
3.Methodologies	Qualitative, Quantitative
4.Statistical analysis	Average(mean, median, mode), percentage, frequency distribution

EVIDENCE GUIDE	
1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Collected up-to-date information 1.2 Analysed collected information 1.3 Submitted report to relevant department
2. Underpinning Knowledge	2.1 Identify information 2.2 Identify data 2.3 Workplace standard
3. Underpinning Skills	3.1 Information collect 3.2 Data collect 3.3 Demonstrate / interpreting and following data sheet, instruction 3.4 Perform the task 3.5 Keeping record and report
4.Required Attitude	4.1 Commitment to occupational health and safety 4.2 Environmental concerns 4.3 Eagerness to learn 4.4 Tidiness and timeliness 4.5 Respect of peers and seniors in workplace
5. Resource Implications	The following resources must be provided: 5.1 Work place 5.2 Materials relevant to the proposed activity 5.3 All tools, equipment, material and documentation required.. 5.4 Relevant specifications or work instructions
6 .Methods of Assessment	Competency must be assessed through: 6.1 Oral Questioning 6.2 Assignment 6.3 Demonstration 6.4 Written Exam.
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SECTOR SPECIFIC UNITS

National Technical and Vocational Qualification Framework for Bangladesh

Unit of Competency

Unit Code & Title	**LESS1006A1 Work In the Light Engineering Sector (Consumer Electronics)**
Nominal Hours	**25**
Unit Descriptor	This unit covers the skills, knowledge and attitude required to work in the Light Engineering sector. It includes the following steps: describing the organizational structure within the sector, identifying processes and procedures, identifying tools, equipment and materials, identifying workplace practices, organizing own workload, and practicing OHS.
Elements of competency	**Performance Criteria** ***Bold & Italic*** words are elaborated in the Range of Variables
1. Describe the organizational structure within the sector	1.1. Scope, nature and ***major fields*** of consumer electronics are identified 1.2. Profile of the consumer electronics in relation to Bangladesh ***employment conditions*** is determined 1.3. Relevant policies and guidelines are identified and interpreted. 1.4. Instructions as to procedures in achieving quality are obtained, understood, and clarified.
2. Identify processes and procedures	2.1. processes are identified, described and explained based on specifications. 2.2. Work activities are correctly identified based on manufacturer's Manuals of Instruction. 2.3. Adjustments are interpreted according to the manuals or specifications.
3. Identify tools, equipment and materials	3.1. Appropriate ***manuals*** are accessed to ensure up-to-date specifications of tools, materials and equipment. 3.2. Consumer electronics ***tools, materials and equipment*** are identified. 3.3. Substitutes are identified in case of non-availability based on workplace requirements.
4. Identify workplace requirements	4.1. ***Workplace requirements*** are identified. 4.2. Relevant ***OHS*** practices are identified, interpreted and implemented. 4.3. Roles and responsibilities of all personnel are identified. 4.4. Workplace's practices are identified. 4.5. ***Problem-solving strategies*** are used to address bottlenecks, inconsistencies and other concerns.

5. Organize own workload	5.1. Own work activities are planned and progress of work is communicated to relevant staff. 5.2. Work activities are completed based on workplace standards. 5.3. Difficulties and bottlenecks are identified, and solutions are put forward. 5.4. Own work is monitored against workplace standards and areas for improvement identified and acted upon.

Range of Variables

Variables	**Ranges** (Include but not limited to):
1. Major Fields	1.1 Testing of Electronic components and measure voltage /current. 1.2 Assembling and Disassembling Consumer Electronic Products and Systems 1.3 Maintaining and Servicing Audio/ Video products and system 1.4 Electronic/Electrical assembly of consumer electronics products. 1.5 Using basic control System. 1.6 Equipment servicing and maintenance 1.7 Maintaining and servicing audio/ video products and systems. 1.8 Maintaining and servicing electrical and electronics-controlled domestic appliances. 1.9 Maintaining and servicing Cellular Phones. 1.10 Maintaining and servicing electronic-controlled office equipment 1.11 Commissioning consumer electronic appliances
2. Employment conditions	2.1. Code of practice 2.2. Salary/wage system 2.3. Anti-discrimination policy 2.4. Gender issues 2.5. Collective bargaining and other practices 2.6. Awards 2.7. Procedures for handling disputes 2.8. Innovations in the Sector
3. Manuals	3.1. Manual of instructions 3.2. Manual of specifications 3.3. Repair manual 3.4. Quality control manual 3.5. Maintenance procedure and troubleshooting manual 3.6. Operations Manual
4. Tools, equipment and materials	**Tools:** 4.1 Cutting Pliers 4.2 Long nose pliers 4.3 Tweezers 4.4 Neon tester 4.5 Soldering Iron 4.6 Electrician Knife 4.14 Digital multimeter 4.15 Pattern Generator 4.16 Frequency counter 4.17 Industrial DC power supply 4.18 LCR Bridge 4.19 Sequence trainer

	4.7 Soldering Sucker 4.8 Wire stripper 4.9 Magnifying glass 4.10 Different types of screw drivers. **Equipment:** 4.11 Analogue oscilloscope 4.12 Digital oscilloscope 4.13 Sweep function generator	4.20 PLC sequence trainer **Materials:** Different values and type of: Capacitor, Resistor, Inductor, transistor, rectifier diode, FET, UJET, DIAC, TRIAC, IC, Transformer, LED, Flexible cable, Soldering lead, Bread board, Vero board
5. Workplace requirements	5.1. Goals and objectives 5.2. Strategic and Operational Plans 5.3. Systems and Processes 5.4. Monitoring and Evaluation 5.5. Reports and Documentation	
6. Problem-solving strategies	6.1. Asking questions 6.2. Feedback and Feed forward system 6.3. Reference to Standard Operating Procedures 6.4. Accessing Information 6.5. Reviews 6.6. Brainstorming	
7. OHS	7.1. Identifying and reporting hazards, risks and emergencies 7.2. Standard Operating Procedure 7.3. Workplace environment and safety 7.4. Safe storage of tools and equipment 7.5. Use of PPE	

Evidence Guide

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Identified major working areas of consumer electronics 1.2 Identified processes and procedures. 1.2 Identified tools, equipment and materials. 1.3 Identified workplace requirements. 1.4 Organized own workload
2. Underpinning knowledge	2.1. Scope and major divisions of the consumer electronics 2.2. Relevant policies and guidelines of consumer electronics 2.3. Relevant terminologies and acronyms 2.4. Types and function of consumer electronics tools.
3. Underpinning Skills	3.1. Describing organization structure 3.2. Using in the consumer electronics 3.3. Identifying consumer Electronics products 3.4. Identifying and handling of tools, equipment 3.5. Identifying electronics components 3.6. Practicing OHS

4. Underpinning Attitude	4.1 Commitment to occupational health and safety 4.2 Environmental concerns 4.3 Eagerness to learn 4.4 Tidiness and timeliness 4.5 Mutual respect in the workplace
5. Resource Implications	The following resources must be provided 5.1 Work place 5.2 Materials relevant to the proposed activity 5.3 Tools, equipment, material and document required 5.4 Relevant specifications or work instructions
6. Method of Assessment	Competency must be assessed by 6.1. Written Test 6.2. Direct observation of processes and procedures 6.3. Oral questioning / interview
7. Context of Assessment	Participants must be assessed individually in the actual work place or in the simulated work place for certification of competency.

Accreditation Requirements

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National Technical and Vocational Qualification Framework for Bangladesh

Unit of Competency

Unit Code And Title	**LESS1007A1 - Interpret Drawings and Specifications**
Nominal Hours	**30**
Unit Descriptor	This unit covers the skills and knowledge required to interpret technical drawing.
Elements of competency	**Performance Criteria** ***Bold & Italic*** words are elaborated in the Range of Variables
1.Follow OSH practices	1.1 Safe work practices observed and personal proactive equipment (PPE) worn as required for the work performed.
2. Select technical drawing	2.1 ***Drawing*** is selected and checked to ensure that it conforms to the job requirements. 2.2 Drawing is validated.
3. Interpret technical drawing	3.1 Drawing components, assemblies are identified. 3.2 Dimensions are identified according to job requirement 3.3 Clearances/tolerances are checked work place standard. 3.4 ***Instructions*** are identified and followed accurately. 3.5 Material specifications are identified. 3.6 Symbols in drawing are interpreted.

Range of Variables

Variable	**Range** (may include but not limited to)
1. Drawing	1.1 Technical drawing 1.2 Sketch 1.3 Specification 1.4 Symbol of electronics items 1.5 Circuit diagram 1.6 Block diagram
2. Instructions	2.1 Note 2.2 Instruction 2.3 Special instruction 2.4 Precaution

EVIDENCE GUIDE	
1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Identified symbol of electronics components according to job requirement. 1.2 Interpreted drawing and circuit diagram.
2. Underpinning Knowledge	2.1 OSH 2.2 Workplace standard 2.3 Sequence of drawing 2.4 Method's of checking drawing or circuit diagram
3. Underpinning Skills	3.1 Practice workplace safety 3.2 Interpreting information on the drawing, following data sheet, instruction and manuals, technical drawing 3.3 Performing the task 3.4 Performing checking 3.5 Keeping record
4.Required Attitude	4.1 Commitment to occupational health and safety 4.2 Environmental concerns 4.3 Eagerness to learn 4.4 Tidiness and timeliness 4.5 Respect of peers and seniors in workplace
5. Resource Implications	The following resources must be provided: 5.1 Work place Procedure 5.2 Materials relevant to the proposed activity 5.3 All tools, equipment, material and documentation required.. 5.4 Relevant specifications or work instructions
6 .Methods of Assessment	Competency must be assessed by- 6.1 Written test 6.2 Observation 6.3 Oral Questioning/Interview
7. Context for Assessment	Participants must be assessed individually in the actual work place or in the simulated work place for certification of competency.

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National Technical and Vocational Qualification Framework for Bangladesh

Unit of Competency

Unit Code And Title	**LESS1008A1 - Use Measuring Instrument**
Nominal Hours	**30**
Unit Descriptor	This unit specifies the competency required to use graduated measuring instruments and associated minor calculations\
Elements of competency	**Performance Criteria** ***Bold & Italic*** words are elaborated in the Range of Variables
1 Prepare For Measurement	1.1 Safe work practices observed and personal proactive equipment (PPE) worn as required for the work place requirement. 1.2 Job is identified to be measured 1.3 Measuring ***instrument and equipment*** is selected according to job requirements. 1.4 ***Routine adjustments*** are done for measurement.
2 Take and record measurement	*2.1* ***Measurement*** is taken with ***basic calculation*** according to the job ***documents.*** 2.2 Measurement is checked against job requirement. 2.3 Measurements are recoded on form/drawing/sketches. 2.4 Recorded measurements are interpreted and communicated to authority.
3 Clean and store measuring instruments.	3.1 Measuring instruments are maintained and cleaned as per instruction manual 3.2 Measuring instruments are stored according to workplace procedures.

Range of Variables	
Variable	**Range** (may include but not limited to)
1. Measuring Instrument and Equipment	1.1 Analogue tester 1.2 Digital multimeter 1.3 Pattern Generator 1.4 Frequency counter 1.5 Industrial DC power supply 1.6 LCR Bridge 1.7 Sequence trainer 1.8 PLC sequence trainer 1.9 Analogue oscilloscope 1.10 Digital oscilloscope 1.11 Sweep function generator
2. Routine adjustments	Calibration, simple zeroing, scale adjustment
3. Measurements	Resistance, capacitance, inductance Voltage, Current, Wave shape (sine, square, sawtooth,).

4. Basic calculations	Addition, Subtraction, multiplication, division, fractions and decimals. Calculations may be done using calculator.
5. Documents	Technical manuals, specifications, written instructions
EVIDENCE GUIDE	
1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Followed OSH Practices 1.2 Selected proper measuring instrument. 1.3 Taken Measurement accurately 1.4 Recorded measurement.
2. Underpinning Knowledge	2.1 Relevant OSH 2.2 Principles of using different measuring Instruments 2.3 Workplace standard 2.4 Sequence of using the instruments 2.5 Maintaining rules of instruments
3. Underpinning Skills	3.1 Practicing workplace safety 3.2 Using PPE 4.1 Selecting proper measuring instrument and equipment 4.2 Performing measurement 4.3 Checking measurement against job requirement. 4.4 Keeping record and report 4.5 Cleaning and storing measuring instrument.
4.Required Attitude	4.1 Commitment to occupational health and safety 4.2 Environmental concerns 4.3 Eagerness to learn 4.4 Tidiness and timeliness 4.5 Respect for rights of peers and seniors in workplace
5. Resource Implications	The following resources must be provided: 5.1 Workplace 5.2 Materials relevant to the proposed activity 5.3 All tools, equipment, material and documentation required.
6 .Methods of Assessment	Competency must be assessed by- 6.1 Written test 6.2 Demonstration 6.3 Oral Questioning/Interview
7. Context for Assessment	Participants must be assessed individually in the actual work place or in a simulated work place.

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National Technical and Vocational Qualification Framework for Bangladesh

Unit of Competency

Unit Code And Title	**LESS1009A1- Use hand tools and power tools**
Nominal Hours	**35**
Unit Descriptor	This unit covers using a range of manual tools, hand held power tools and fixed power tools for hand held operations for a variety of light Engineering applications.
Elements of competency	**Performance Criteria** ***Bold & Italic*** words are elaborated in the Range of Variables
1 Prepare for using hand power tools	1.1 Safe work practices observed and personal proactive equipment (PPE) worn as required for the work place requirement. 1.2 Job is identified on which the tools will be used 1.3 Hand tools are selected according to job requirements. 1.4 ***Power tools*** are identified and selected conforming to the task requirements. 1.5 Unsafe or faulty tools are identified and marked for repair /reject before using
2 Use Manual tools	2.1 ***Hand tools*** are used according to the job requirement.
3 Use power tools	3.1 Power tools are used for a specific ***sequence of operations*** 3.2 Produce desired outcomes conforming to ***job specifications*** 3.3 All safety requirements are compiled during and after use.. 3.4 ***Operational maintenance*** of tools is undertaken according to standard procedures.
4 Clean and store hand and power tools.	4.1 Hand and power tools are maintained and cleaned as per instruction manual 4.2 Hand and power tools are stored safely in appropriate location according to standard workshop procedures and manufacturers' recommendations. 4.3 Unsafe or faulty tools are identified and marked for repair after use according to current procedures

Range of Variables	
Variable	**Range** (may include but not limited to) **:**
1. Power tools	Electric drills, grinders, routers, mini hand drills, soldering iron, electric driver etc.
2. Hand Tools	Plastic Hammer, adjustable wrenches, smooth files, minisaw, Cutting Pliers, Long nose pliers, Tweezers, Neon tester, Soldering Iron, Electrician Knife, Soldering Sucker, Wire stripper, Magnifying glass, Different types of screw drivers.
3. Sequence of operations	Clamping, alignment and adjustment
4. Job specifications	Finish size or shape etc
5. Operational maintenance	Cleaning, simple tools repairs and adjustments using engineering principles.

EVIDENCE GUIDE	
1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Followed OSH and used PPE 1.2 Followed proper using procedure of manual tools. 1.3 Used hand tools as per workplace requirement. 1.4 Maintained safety precaution for using hand & power tools. 1.5 Maintained operation procedure of power tools. 1.6 Used power tools as per workplace requirement
2. Underpinning Knowledge	2.1 Safely use Hand tool & Power tools 2.2 Types of Hand & Power tools 2.3 Working Principles of Hands & Power tools: 2.4 Preventive Maintenance
3. Underpinning Skills	3.1 Identifying appropriate Tools 3.2 Using hand & Power tools safely 3.3 Performing Preventive Maintenance 3.4 Practicing OHS 3.5 Following 5S of house keeping
4.Required Attitude	4.1 Commitment to occupational health and safety 4.2 Environmental concerns 4.3 Eagerness to learn 4.4 Tidiness and timeliness 4.5 Respect of peers and seniors in workplace
5. Resource Implications	The following resources must be provided: 5.1 Workplace 5.2 Tools and equipment appropriate to maintain workplace 5.3 Materials relevant to the proposed activity 5.4 Relevant drawings, manuals, standards and reference material
6 .Methods of Assessment	Competency must be assessed by- 6.1 Written test 6.2 Demonstration 6.3 Oral questioning / interview

7. Context for Assessment	Participants must be assessed individually in the actual work place or in a simulated work place.

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National Technical and Vocational Qualification Framework for Bangladesh

Unit of Competency

Unit Code And Title	**LESS3010A1 - Apply quality systems and procedures**
Nominal Hours	**30**
Unit Descriptor	This unit covers the knowledge, skills and attitude required for working within quality improvement systems and applying established quality procedures to his own work within a manufacturing environment.
Elements Of Competency	**Performance Criteria** ***Bold & Italic*** terms are elaborated in the range of variables
1. Follow OSH practices	1.1 Safe work practices observed and personal protective Equipment (PPE) worn as required for the work performed.
2. Work within a quality system	2.1 Instructions and procedures are followed strictly and duties are performed in accordance with demand of ***quality system.*** 2.2 Conformance to specifications is ensured. 2.3 Defects are detected and reported to authority according to standard operating procedures. 2.4 Customer's satisfaction is ensured in performing an operation or quality of product or services.
3. Apply and monitor a quality system improvement	3.1 Performance measurement systems are identified. 3.2 Performance is assessed at regular interval. 3.3 Specifications and standard operating procedures are established and identified. 3.4 Defects are detected and reported according to standard operating procedures. 3.5 Process improvement procedures are participated in. 3.6 The improvement of internal / external customer / supplier relationships is participated in. 3.7 Performance of operation or quality of product or service is monitored to ensure customer satisfaction.
4. Take responsibility for his/her own quality	4.1 Concept of supplying product or service to meet the ***customer's requirements*** is understood and accordingly applied. 4.2 Responsibility is taken for quality of own work.
5. Apply standard procedures for each job	5.1 ***Quality*** system procedures for each job are followed. 5.2 Conformance to specification is ensured in every case at all situations.

Range of Variables

Variable	**Range** (Included but not limited to):
1. Quality improvement system	A system comprising some or all of the following elements: - Quality inspection - Quality control - Quality improvement - Teal quality control - Quality assurance
2. Customer requirement	Person or organization receiving the product or service
3. Quality	Consistently meeting customer's requirements.

EVIDENCE GUIDE	
1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Used personal protective equipment. 1.2 Maintained proper specification and standard of product. 1.3 Checked product/ electronics Items for quality assurance as per specification. 1.4 Detected defects and take corrective and/or quality improvement actions. 1.5 Ensured customer satisfaction.
2. Underpinning Knowledge	2.1 Meaning of the key terms - quality, quality assurance, quality control, quality inspection, quality improvement and total quality control 2.2 Process and procedures for improving and maintaining quality - Defects and procedures for addressing defects 2.3 Factors, which affect the successful implementation of the quality systems and procedures 2.4 Importance of taking ownership for quality of products and services 2.5 Types of customers/suppliers and their needs/responsibilities 2.6 Factors affecting customer relationships and customer satisfaction.
3. Underpinning Skills	3.1 Identifying the role of self and others within the quality improvement system 3.2 Following instructions, job sheets, and standard operating procedures and actively participate in the implementation of a quality improvement system 3.3 Identifying product and process specifications 3.4 Detecting defects, take corrective and/or quality improvement actions 3.5 Keeping records in accordance with standard operating procedures. 3.6 Identifying customer requirements and always meet those requirements
4.Required Attitude	4.1 Commitment to occupational health and safety 4.2 Environmental concerns 4.3 Eagerness to learn 4.4 Tidiness and timeliness 4.5 Respect for rights of peers and seniors in workplace

5. Resource Implications	The following resources must be provided: 5.1 Workplace 5.2 Tools and equipment appropriate to maintain workplace 5.3 Materials relevant to the proposed activity 5.4 Relevant drawings, manuals, standards and reference material
6 .Methods of Assessment	Competency must be assessed through: 6.1 Written Exam. 6.2 Demonstration 6.3 Oral Questioning/Interview
7. Context for Assessment	Participants must be assessed individually in the actual work place or in a simulated work place.

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OCCUPATION SPECIFIC UNITS

National Technical and Vocational Qualification Framework for Bangladesh

Unit of Competence

Unit Code and Title	LECONELE1011A1 Perform Testing of Electronic Components and Measure Voltage /Current.
Nominal Hours	20
Unit Descriptor	This unit covers the knowledge skills and attitudes required to measure voltage and current use in consumer electronics servicing
Elements of competency	Performance Criteria ***Bold & Italic*** words are elaborated in the Range of Variables 1.1 Safe
1. Prepare for testing and measuring	work practices observed and personal proactive equipment (PPE) worn as required for the work place requirement. 1.2 Appropriate equipment are selected according to tasks requirements. 1.3 ***Measuring/testing equipment*** and work place are prepared according to specification and tasks. 1.4 Power supply and component needed to complete the work are prepared.
2. Measure Electrical Quantities	2.1 Measuring equipment are connected with power supply unit according to the instruction 2.2 ***Electrical quantities*** are measured in accordance with set procedures. 2.3 Measurements are checked in accordance with set standard and recorded accordingly.
3. Test components	3.1 Terminal of testing equipment is connected to the ***components*** according to testing instruction 3.2 Components are Tested and checked.as per set standards
4 Clean and store measuring and testing equipment.	4.1 measuring and testing equipment are cleaned and maintained as per instruction manual 4.2 measuring and testing equipment are stored safely in appropriate location according to standard workshop procedures 4.3 Unsafe or faulty equipment. are identified and marked for repair after use according to current procedures

Range of Variables

Variable	Range (Included but not limited to):	
1. Measuring equipment	1.1 Ohm meter. 1.2 Analogue multi meter. 1.3 Digital multi meter 1.4 Analogue tester 1.5 Digital multi meter 1.6 Pattern Generator 1.7 Frequency counter	1.8 Industrial DC power supply 1.9 LCR Bridge 1.10 Sequence trainer 1.11 PLC sequence trainer 1.12 Analogue oscilloscope 1.13 Digital oscilloscope 1.14 Sweep function generator
2. Electrical Quantities	Resistance, capacitance, inductance Voltage, Current, Wave shape (sine, square, sawtooth,).	
3. Measuring and testing component.	3.1 Cells and battery. 3.2 Variable power supply. 3.3 Resistor and variable resistor. 3.4 Connecting wires 3.5 N.P.N bypolor transistor. 3.6 P.N.P bipolar transistor. 3.7 Different types of resistor. 3.8 Different kinds of transformer.	3.9 Different kinds of capacitors. 3.10 Different kinds of rectifiers. 3.11 Diode 3.12 SCR 3.13 DIAC 3.14 TRIAC 3.15 FET 3.16 MosFET 3.17 LED

EVIDENCE GUIDE	
1. Critical aspects at competency.	1.1 Applied safety rules and used PPE . 1.2 Used measuring equipment and power supply unit 1.3 Measured electrical quantities 1.4 Tested and checked electronics component.
2. Underpinning knowledge	2.1 Proper calibration of measuring and testing equipment. 2.2 Conversion of measuring Units. 2.3 Fundamentals of Electrical Quantities. 2.4 Principles of using measuring and testing equipment
3. Underpinning Skills	3.1 Identifying of testing and measuring equipment and components. 3.2 Working with safety practices and time management. 3.3 Applying techniques of measuring electrical quantities 3.4 Using techniques of testing electronics components 3.5 Following 5S of house keeping

4.Required Attitude	4.1 Commitment to occupational health and safety 4.2 Environmental concerns 4.3 Tidiness and timeliness 4.4 Respect of peers and seniors in workplace
5.Resource Implication.	The following resources must be provided. 5.1 Workplace 5.2 Materials relevant to the proposed activity 5.3 All tools, equipment, material and documentation required 5.4 Relevant specifications or work instructions
6.Method assessment.	Competency must be assessed :by- 6.1 Written test 6.2 Demonstration 6.3 Oral Questioning/Interview
7.Context assessment	Participants must be assessed individually in the actual work place or in a simulated work place.

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National Technical and Vocational Qualification Framework for Bangladesh

Unit of Competence

Unit Code and Title	**LECONELE1012A1 Terminate and Connect Electrical and Electronics Circuit**
Nominal Hours	**30**
Unit Descriptor	This unit covers the knowledge, skills and attitudes needed to terminate and connect electrical and electronic circuits
Element of Competency	**PERFORMANCECRITERIA** ***Bold & Italicized*** terms are elaborated in the Range of Variables
1. Prepare for termination /connection	1.1 Safe work practices observed and ***personal proactive equipment*** (PPE) worn as required for the work place requirement. 1.2 Necessary ***Materials*** are selected and checked according to specifications and tasks. 1.3 Appropriate ***tools and equipment*** are selected according to tasks requirements. 1.4 Power supply's and component needed to complete the work are prepared. 1.5 Electrical and electronic circuits are correctly prepared for termination /connection in accordance with instructions and work site procedures.
2. Terminate and connect electrical and electronic circuits	2.1 Circuits are checked and isolated using **specified *procedures*** 2.2 Defects of connection are identified, verified as per procedure. 2.3 Circuit is terminated for servicing and replacing in accordance workplace and standard procedures. 2.4 Repaired / replaceable circuit is connected in proper place in accordance with standard procedures. 2.5 Correct sequence of operation is followed according to job specifications.
3. Test termination and connections	3.1 Circuits are checked using specified testing procedures. 3.2 Testing of all completed termination/ connections of electric and electronic circuits is conducted for compliance with specifications
4. Clean and store tools and equipment	4.1 Cleaning of tools and equipment is performed in accordance with work site procedures. 4.2 Tools and equipment are stored safely in appropriate location according to standard procedures

RANGE OF VARIABLES	
VARIABLE	**Range** (Included but not limited to):
1. Personal protective equipment	1.1 Goggles 1.2 Insulated Gloves 1.3 Apron/overall 1.4 Insulated shoe
2. Materials	2.1 Soldering lead 2.2 Cables 2.3 Wires 2.4 Switch 2.5 Connector
3. Tools and equipment	3.1 Tools 3.2 Long nose Pliers 3.3 Combination pliers 3.4 Cutters 3.5 Screw drivers 3.6 Neon tester 3.7 Wire stripper 3.8 Soldering sucker **Equipment** 3.9 Soldering gun/Iron 3.10 Multi-tester 3.11 Mini electric hand drill
4. Specified procedure	4.1 Checking open circuit, short circuit, High voltage, Low Voltage, lose connection of positive and negative terminal 4.2 Visual inspection with power off 4.3 Pin connection 4.4 Soldering and de soldering joints

EVIDENCE GUIDE	
1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1. Undertook work safely and according to workplace and standard procedures 1.2. Used appropriate termination/ connection methods 1.3. Conducted testing of terminated /connected electrical wiring/electronic circuits using appropriate procedures and standards
2. Underpinning knowledge	2.1 Principle of using test instruments/equipment 2.2 Electrical theory (AC/DC) 2.3 Single phase AC principles
3. Underpinning skills	3.1 Applying soldering and de soldering techniques 3.2 Using tools and equipment for terminating & connecting electrical and electronic circuits 3.3 Using testing instruments to test terminated/connected electrical and electronics circuits
4. Required Attitude	4.1 Commitment to occupational health and safety 4.2 Environmental concerns 4.3 Tidiness and timeliness 4.4 Respect for rights of peers and seniors in workplace
5. Resource implications	The following resources must be provided. 5.1 Workplace 5.2 Materials relevant to the proposed activity 5.3 All tools, equipment, material and documentation required 5.4 Relevant specifications or work instructions
6. Method of assessment	Competency must be assessed :by- 6.1 Written test 6.2 Demonstration 6.3 Oral Questioning/Interview
7. Context of assessment	Participants must be assessed individually in the actual work place or in a simulated work place.

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National Technical and Vocational Qualification Framework for Bangladesh

Unit of Competence

Unit Code and Title	**LECONELE1013A1 Assemble and Disassemble Consumer Electronic Appliances**
Nominal Hours	**40**
Unit Descriptor	This unit covers the knowledge, skills and attitudes required to assemble/ disassemble consumer electronic appliances using specified tools, testing & measuring instruments.
Elements of Competency	**PERFORMANCE CRITERIA** ***Bold & Italic*** terms are elaborated in the range of variables
1. Prepare appliances, tools and workplace for assembly.	1.1 Safe work practices observed and personal protective Equipment are (PPE) worn as required for the work performed. 1.2 Assembly workplace is prepared in accordance with ***OH&S policies and procedures***. 1.3 ***Responsible person*** is consulted for effective and proper work coordination. 1.4 Required ***materials***, ***tools and equipment*** are prepared and checked in accordance with work place requirement. 1.5 ***Components of appliances*** are needed to complete the work are prepared and obtained according to requirements.
2. Assemble and disassemble appliances	2.1 Assembling and disassembling are performed conforming to the work requirement. 2.2 Soldering and de soldering processes are performed as per work requirement 2.3 Soldered are checked in accordance with ***quality standards***. 2.4 Process is checked according to established standards and requirements.
3. Test and check assembled appliances	3.1 Finished products are subjected to final visual inspection and testing in accordance with quality standards, procedures and requirements. 3.2 Work completion is documented and responsible person is informed in accordance with established procedures.
5 Clean and store the appliances and testing equipment.	5.1 Appliances and testing equipment are cleaned and maintained as per instruction manual 5.2 Appliances and testing equipment are stored safely in appropriate location according to standard workshop procedures

RANGE OF VARIABLES

Variables	**Range** (Included but not limited to):
1. OH&S policies and procedures	1.1 Hazardous and risk assessment mechanisms. 1.2 Implementation of safety regulations. 1.3 Safety training. 1.4 Safety systems incorporating. 1.5 Work clearance procedures 1.6 Isolation procedures. 1.7 Use of protective equipment and clothing
2. Responsible person	2.1 Immediate instructor 2.2 Service supervisor
3. Materials, tools and equipment	Tools 3.1 Soldering iron 3.1 Screwdriver (assorted) 3.2 Utility knife/stripper 3.3 Pliers (assorted) 3.4 Test jig 3.5 Work bench with mirror 3.6 Blower machine 3.7 Insulation floor mat 3.8 Magnifying glass with stand 3.9 Cleaning brush 3.10 Soldering sucker **Materials** 3.11 Lead-free solder 3.12 Cleaning agent 3.13 Wires 3.14 Assorted electronic components 3.15 Insulation floor mat **Equipment** 3.16 Analogue oscilloscope 3.17 Digital oscilloscope 3.18 Digital multimeter 3.19 Pattern Generator 3.20 AVO meter
4. Components of appliances	Power section, Control panel, Audio section, Video section System control, Horizontal section and vertical section, EHT section Motor unit
5. Quality standards.	5.1 Soldering without short circuit 5.2 Without dry solder 5.3 Soldering point must be brilliant and cleaned 5.4 Proper setting of component and wire without scattering soldering materials

EVIDENCE GUIDE	
1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Applied safety rules and procedure 1.2 Identified proper tools, materials and equipment. 1.3 Identified electronic components and devices and its proper handling 1.4 Assembled and disassembled appliances 1.5 Conducted testing assembled appliance.
2. Underpinning knowledge	2.1 Principle of handling digital instruments and electronic components 2.2 Fundamentals of PCB assembly 2.3 Fundamentals of soldering and de soldering
3. Underpinning skills	3.1 Identifying connectors and terminators 3.2 Using and maintaining of tools and equipment 3.3 Soldering and de soldering component 3.4 Applying techniques of Assembling and disassembling component. 3.5 Using testing instruments
4. Required Attitude	4.1 Commitment to occupational health and safety 4.2 Environmental concerns 4.3 Tidiness and timeliness 4.4 Respect of peers and seniors in workplace
5. Resource implications	The following resources must be provided. 5.1 Workplace 5.2 Materials relevant to the proposed activity 5.3 All tools, equipment, material and documentation required 5.4 Relevant specifications or work instructions
6. Method of assessment	Competency must be assessed :by- 6.1 Written test 6.2 Demonstration 6.3 Oral Questioning/Interview
7. Context of assessment	Participants must be assessed individually in the actual work place or in a simulated work place.

Accreditation Requirements

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National Technical and Vocational Qualification Framework for Bangladesh

Unit of Competence

Unit Code And Title	**LECONELE1014A1 Maintain and Service Audio-Video products and system**
Nominal Hours	**60**
Unit Descriptor	This unit covers the knowledge, skills and attitudes required to maintain and service audio-video appliances and including diagnosing faults, reassembling, testing and preparing reports
Elements of Competency	**Performance Criteria** ***Bold & Italic*** terms are elaborated in the range of variables
1. Prepare for servicing Audio-Video appliance	1.1 Safe work practices observed and personal protective Equipment are (PPE) worn as required for the work performed. 1.2 ***Necessary tools, equipment and test*** are prepared in line with job requirements 1.3 Workplace is prepared in consistent with servicing standard.
2. Diagnose faults	2.1 Complete ***check-up*** of appliance is conducted and defects are identified, verified and documented against customer description. 2.2 ***Service manuals*** and ***service information*** required for repair/maintenance are acquired as per standard procedure. 2.3 Systematic pre-testing procedure is observed in accordance with manufacturer's instructions. 2.4 System defects/Fault symptoms are identified using appropriate tools and equipment 2.5 Circuits are checked and isolated using specified testing procedures 2.6 Control settings/adjustments are checked in accordance with service-manual specifications. 2.7 Results of diagnosis and testing are documented in prescribed form

3 Service Audio-Video Appliance	3.1 Defective parts/components of ***audio video appliances*** are replaced with identical or recommended equivalent ratings 3.2 Replaced parts/components are soldered/mounted in accordance with quality standard. 3.3 Control settings/adjustments are performed in according to service-manual specifications 3.4 Care and extreme precaution in handling the unit is observed as per procedures
4 Reassemble and test repaired appliances	4.1 Repaired units are reassembled according to procedures 4.2 Reassembled units are subjected to final testing as per manufacturer's specifications 4.3 Service completion procedures and documentations are submitted to ***responsible expert person.***
5 Clean and store appliances and workplace	*5.1* Waste materials are disposed of in accordance with environmental requirements. 5.2 Cleaning of unit is performed in accordance with standard procedures 5.3 Appliances, tools and equipment are stored safely in appropriate location according to standard place procedures

RANGE OF VARIABLES

Variable	**Range** (Included but not limited to):	
1. Tools, equipment and test instruments	1.1 Variable power supply 1.2 Soldering iron/gun 1.3 De soldering tools 1.4 Screwdriver (assorted) 1.5 Multi-testers (analogue/digital) 1.6 Utility knife/stripper 1.7 Pliers (assorted) 1.8 Test jig 1.9 Work bench with mirror 1.10 Wrist earthing cable	1.13 Wireless Microphone. 1.14 Professional VHF Wireless PA Microphone 1.15 Oscilloscope 1.16 TV pattern generator 1.17 Lamp with stand 1.18 Flashlight 1.19 Cleaning brush 1.20 High voltage probe

	1.11 Microphone(Unidirectional) 1.12 Microphone(bidirectional) Microphone(Unidirectional Condenser)	1.21 Soldering lead 1.22 Wires Assorted electronic components
2. Check up	2.1 Checking broken, burning, sparking, short circuit, Over heating 2.2 Visual inspection of the unit with power off 2.3 Interview of customer re history of unit 2.4 Operate the unit according to manual to confirm defects	
3. Service manuals	3.1 Service manual/schematic diagram/parts list. 3.2 Operating instructions/User's/Owner's manual	
4. Service Information	4.1 Job Report Sheets. 4.2 Customer index. 4.3 Service flowchart. 4.4 Stock and inventory record. 4.5 Requisition slips (for acquisition of parts). 4.6 Supplier Index	
5. Audio-Video appliances	Audio systems.: 5.1 Electronic musical instruments/keyboards. 5.2 Professional audio/Public-address (PA) system 5.3 I POD 5.4 I PAD 5.5 PA Audio mixing device 5.6 PA Audio Splitter 5.7 Mobile PA Amplifiers 5.8 Video systems. 5.9 DVD/VCD Player. 5.10 Television(CRT,LCD System)	

EVIDENCE GUIDE	
1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Prepared the required materials, tools, equipment and workshop properly. 1.2 Applied safety rules and procedures 1.3 Identified faults and defects in accordance with testing procedures 1.4 Followed service manual specifications/instructions 1.5 Serviced Audio-Video appliances 1.6 Conducted final testing of serviced appliances
2. Underpinning knowledge	2.1 Principles of Electrical circuits(AC/DC) 2.2 Fundamentals of electronic components and circuits 2.3 Fundamentals of digital logics circuit 2.4 Fundamentals of audio and video amplifiers 2.5 Fundamentals of audio source. 2.6 Fundamentals of colour television(CRT, LCD, VGA port, PC port, USB port)
3. Underpinning skills	3.1 Interpreting electronic schematic symbols and diagram 3.2 Using tools and equipment 3.3 Checking and testing to identify faults 3.4 Using servicing techniques of appliances 3.5 Applying the process of reassembling serviced components 4.1
4. Required Attitude	Commitment to occupational health and safety 4.2 Environmental concerns 4.3 Tidiness and timeliness 4.4 Respect of peers and seniors in workplace
5. Resource implications	The following resources must be provided. 5.1 Workplace 5.2 Materials relevant to the proposed activity 5.3 All tools, equipment, material and documentation required 5.4 Relevant specifications or work instructions
6. Method of assessment	Competency must be assessed :by- 6.1 Written test 6.2 Demonstration 6.3 Oral Questioning/Interview
7. Context of assessment	Participants must be assessed individually in the actual work place or in a simulated work place.

Accreditation Requirements

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National Technical and Vocational Qualification Framework for Bangladesh

Unit of Competence

Unit Code & Title	LECONELE1015A1 Test Function and quality of assembled electronic appliances
Nominal Hours	50
Unit Descriptor	This Unit Covers knowledge, skill and attitude to test function and quality of assembled electronic. Which includes setting up testing equipment, working safely with electricity, following testing and inspection procedures.
Elements of Competency	Performance Criteria ***Bold & Italic*** terms are elaborated in the range of variables
1. Prepare for testing	1.1 Safe work practices observed and personal proactive equipment (PPE) worn as required for the work place requirement. 1.2 Appropriate equipment are selected according to tasks requirements. 1.3 ***Testing tools, equipment, materials*** and work place are prepared according to specification and tasks. 1.4 Power supply and component needed to complete the work are prepared. 1.5 ***Testing processes*** and procedures are reviewed and testing equipment is checked for correct operation and safety.
2. Conduct testing	2.1 Assembled unit is checked and inspected as being isolated where necessary in accordance with procedures. 2.2 Testing is conducted in accordance with principles and technology of electrical measurement. 2.3 Test results are interpreted within the scope of required function and quality.
3. Report on apparatus testing and inspection.	3.1 Recommendations on repairs/replace to defects are reported within the scope of established procedures 3.2 Report forms/data sheets on testing and inspection are completed accurately.
4. Clean and store tools and equipment	4.1 Waste materials are disposed of in accordance with environmental requirements.

	4.2 Cleaning of equipment is performed in accordance with standard procedures 4.3 Tools and equipment are stored safely in appropriate location according to standard place procedures

RANGE OF VARIABLES		
Variables	**Range** (Included but not limited to):	
1. Tools, Equipment and materials	1.1 Test jig 1.2 Work bench with mirror 1.3 Magnifying glass with stand 1.4 Cleaning brush 1.5 Cleaning agent	1.6 AVO meter 1.7 Signal generator 1.8 Oscilloscope 1.9 Pattern generator 1.10 Assembly kit
2. Testing Process	2.1 Supplies, Materials and equipment preparation 2.2 Familiarize with the diagram and the product 2.3 Set up testing equipment 2.4 Perform testing 2.5 Interpretation and report testing and inspection results	

EVIDENCE GUIDE	
1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Setup the testing tools and equipment according to specific requirements within timeframe allotted 1.2 Identified electronic apparatus and devices and its proper handling 1.3 Conducted testing in accordance with principles and technology of electrical measurement. 1.4 Interpreted test result within the required function and quality. 1.5 Identified visual defects. 1.6 Reported test results.
2. Underpinning	2.1 Principles of electrical circuits(AC/DC) 2.2 Fundamentals of electronic components and circuits of

knowledge	appliances. 2.3 Operating principles of appliances 2.4 Fundamentals of digital logics circuit.
3. Underpinning skills	3.1 Interpreting manufacturer's manuals and instruction 3.2 Using and maintaining of testing tools and equipment 3.3 Setting testing apparatus 3.4 Applying techniques of testing appliances 3.5 Recording and reporting data
4. Required Attitude	4.1 Commitment to occupational health and safety 4.2 Environmental concerns 4.3 Tidiness and timeliness 4.4 Respect for rights of peers and seniors in workplace
5. Resource implications	The following resources must be provided. 5.1 Workplace 5.2 Materials relevant to the proposed activity 5.3 All tools, equipment, material and documentation required 5.4 Relevant specifications or work instructions
6. Method of assessment	Competency must be assessed :by- 6.1 Written test 6.2 Demonstration 6.3 Oral Questioning/Interview
7. Context of assessment	Participants must be assessed individually in the actual work place or in a simulated work place.

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National Technical and Vocational Qualification Framework for Bangladesh

Unit of Competence

Unit Code and Title	**LECONELE2016A1 Maintain and Service Electrical and Electronics-Controlled Domestic Appliances**
Nominal Hours	**60**
Unit Descriptor	This unit covers the knowledge, skills and attitudes required to maintain and service electrical and electronic controlled domestic appliances including diagnosing faults, reassembling, testing and preparing reports.
Elements of Competency	**Performance Criteria** ***Bold & Italicized*** terms are elaborated in the range of variables 1.1
1. Prepare for maintain and service domestic appliance	Safe work practices observed and personal proactive equipment (PPE) worn as required for the work place requirement. 1.2 Appropriate equipment are selected according to tasks requirements. 1.3 ***Testing tools, equipment, materials*** and work place are prepared in line with job requirements. 1.4 ***Service manuals*** and ***service information*** required for repair/maintenance are acquired as per standard procedures.
2. Diagnose faults	2.1 Systematic ***pre-testing procedure*** is observed in accordance with manufacturer's instructions. 2.2 System defect/Fault symptoms of ***appliances*** are identified using appropriate tools and equipment and in accordance with safety procedures 2.3 Circuits are checked and isolated using specified testing procedures 2.4 Control settings/adjustments are checked in conformity with service-manual specifications 2.5 Results of diagnosis and testing are documented completely 2.6 Customers are advised/informed regarding the status and serviceability of the unit as per procedures
3. Maintain and service appliances	3.1 Defective parts/components are replaced with identical or recommended appropriate equivalent ratings

	3.2 Repaired or replaced parts/components are soldered/mounted in accordance with the current industry standards. 3.3 Control settings/adjustments are performed in conformity with service-manual specifications 3.4 Care and extreme precaution in handling the unit/product is observed as per procedures
4. Test appliance	4.1 Repaired units are reassembled according to procedures 4.2 Reassembled units are subjected to final testing in conformity with manufacturer's specifications 4.3 Service completion procedures and documentations are complied with based on manual.
5. Clean and store tools and equipment	*5.1* Waste materials are disposed of in accordance with environmental requirements. 5.2 Cleaning of equipment is performed in accordance with work site procedures 5.3 Tools and equipment are stored safely in appropriate location according to standard procedures

RANGE OF VARIABLES

Variable	**Range** (Included but not limited to):	
1. Tools, equipment, materials	1.1 Step-down transformer 1.2 Soldering iron/gun 1.3 Screwdriver (assorted) 1.4 Nut drivers (assorted) 1.5 Wrenches (assorted) 1.6 Multi-testers (analogue/digital) 1.7 Utility knife 1.8 Wire stripper 1.9 Pliers (assorted) 1.10 Work bench	4.11 Flashlight 4.12 Test light 4.13 Cleaning brush 4.14 Soldering lead 4.15 Wires, various sizes 4.16 Assorted electronic components
2. Service manuals	2.1 Service manual/schematic diagram/parts list 2.2 Operating instructions/User's/Owner's manual	
3. Service Information	3.1 Job Report Sheets	

	3.2 Job Order 3.3 Bill of materials 3.4 Customer index 3.5 Service flowchart 3.6 Stock and inventory record 3.7 Requisition slips (for acquisition of parts) 3.8 Supplier Index
4. Pre-testing procedures	4.1 Visual inspection of the appliance with power off 4.2 Interview of customer on history of the appliance 4.3 Operate the appliance according to manual to confirm defects
5. Domestic Appliances	5.1 Washing Machines 5.2 Vacuum Cleaners and Polishers 5.3 Pressure Cooker 5.4 Rice Cooker 5.5 Blender 5.6 Coffee maker 5.7 Toaster, 5.8 Microwave Oven 5.9 Electric woven 5.10 Home security equipment (CC Camera) 5.11 Refrigerator 5.12 Air cooler 5.13 Ice cream maker 5.14 Television (Color, LED, LCD and CRT) 5.15 Video and Still camera

EVIDENCE GUIDE	
1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Prepared necessary tools, test instruments and personal protective equipment in line with job requirements. 1.2 Used safety rules and procedure 1.3 Carried out checking to Identify system defects/fault symptoms 1.4 Replaced defective parts/components with identical or recommended appropriate equivalent ratings 1.5 Performed control setting/adjustments in conformity with service manual specifications 1.6 Tested reassembled appliances to ensure proper functioning.
2. Underpinning knowledge	2.1 Basic electrical/ electronic circuit. 2.2 Fundamentals of electronic components and circuits of domestic appliances

	2.3 Fundamentals of digital logic circuit. 2.4 Fundamentals of operating system and settings 2.5 Fundamentals of solenoids, relays and motors 2.6 Fundamentals of remote control.
3. Underpinning skills	3.1 Application of troubleshooting technique 3.2 Using and maintenance of test instruments, tools, & equipment 3.3 Soldering/de soldering. 3.4 Checking to Identify system defects/fault symptoms 3.5 Replacing defective parts/components with identical or recommended appropriate equivalent ratings 3.6 Performing control setting/adjustments
4. Required Attitude	4.1 Commitment to occupational health and safety 4.2 Environmental concerns 4.3 Tidiness and timeliness 4.4 Respect of peers and seniors in workplace
5. Resource implications	The following resources must be provided. 5.1 Workplace 5.2 Materials relevant to the proposed activity 5.3 All tools, equipment, material and documentation required 5.4 Relevant specifications or work instructions
6. Method of assessment	Competency must be assessed :by- 6.1 Written test 6.2 Demonstration 6.3 Oral Questioning/Interview
7. Context of assessment	Participants must be assessed individually in the actual work place or in a simulated work place.

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National Technical and Vocational Qualification Framework for Bangladesh
Unit of Competence

Unit Code & Title	**LECONELE2017A1 Download and Use Software**
Nominal Hours	**30**
Unit Descriptor	This unit covers the knowledge, skills and attitudes needed to use internet, identify website and software, download software and use software
Elements of Competency	**Performance Criteria** ***Bold & Italic*** terms are elaborated in the range of variables
1. prepare for task to be undertaken	1.1 Safe work practices observed in accordance with occupational health and safety (OHS) requirements 1.2 ***Appropriate equipment*** are selected according to the requirement of internet connectivity. 1.3 ***Browsing software*** is selected according to task requirement
2. Use Internet	2.1. Web sites are identified for browsing information according to necessity. 2.2. User Account is opened as per specified sequence 2.3. Login specific E-mail ID as per specified sequence 2.4. information is received and sent in accordance with specified process.
3. Identify website and software	3.1 ***Required website*** is identified in accordance with work requirement. 3.2 Search engine is used to find information of unidentified website. 3.3 ***Search engine*** is used to find required software according to requirements
4. Download software	4.1 Required software and files are selected in accordance with work requirement 4.2 Files and software are downloaded as per standard procedure 4.3 Files and software are saved in specified drive or folder
5. Use software	5.1 Down loaded software is selected as per task requirement 5.2 Required software is installed according to the recommended procedures 5.3 Software is used as per work requirement following specified help file or manual if necessary.

RANGE OF VARIABLES	
Variable	**Range** (Included but not limited to):
1. Appropriate Equipment	1.1. Personal computers 1.2. Internet connectivity 1.3. Communication equipment ▪ Hub ▪ Switch ▪ Modem 1.4. Printers
2. Browsing Software	2.1. Internet Explorer 2.2. Mozilla Firefox.. 2.3. Opera
3. Website/Search Engine	3.1. Google 3.2. Yahoo 3.3. Twitter

EVIDENCE GUIDE	
1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1. Selected and used hardware components correctly and according to the task requirement 1.2. Received and sent data through internet 1.3. Used search engine to download specific software. 1.4. Used software as per work requirement
2. Underpinning knowledge	2.1 Storage devices and basic categories of memory 2.2 General security 2.3 Difference between website and search engine 2.4 Software installation system 2.5 Fundamental of simulation software
3. Underpinning skills	3.1 Browsing 3.2 Receiving and sending mails 3.3 Using search engine 3.4 Applying techniques of down loading software 3.5 Installing software 3.6 Using software

4. Required Attitude	4.1 Commitment to occupational health and safety 4.2 Environmental concerns 4.3 Tidiness and timeliness 4.4 Respect of peers and seniors in workplace
5. Resource implications	The following resources must be provided. 5.1 Workplace 5.2 Equipment relevant to the proposed activity 5.3 All tools, equipment, material and documentation required 5.4 Relevant specifications or work instructions
6. Method of assessment	Competency must be assessed :by- 6.1 Written test 6.2 Demonstration 6.3 Oral Questioning/Interview
7. Context of assessment	Participants must be assessed individually in the actual work place or in a simulated work place.

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National Technical and Vocational Qualification Framework for Bangladesh

Unit of Competence

Unit Code and Title	LECONELE2018A1 Maintain and Service Cellular Phones
Nominal Hours	**80**
Unit Descriptor	This unit covers the knowledge, skills and attitudes required to service and repair cellular mobile phones including diagnosing faults, preparing reports.
Elements of Competency	**Performance Criteria** ***Bold & Italic*** terms are elaborated in the range of variables
1. Prepare for maintain and repair cellular phones	1.1 Safe work practices observed and ***personal proactive equipment*** (PPE) worn as required for the work place requirement. 1.2 Appropriate equipment are selected according to tasks requirements. 1.3 Necessary ***tools***, ***test instruments, materials*** and work place are prepared in line with job requirements. 1.4 ***Service manuals*** and ***service information*** required for repair/maintenance are acquired as per standard procedures.
2. Diagnose faults of cellular phone	2.1 Systematic ***pre-testing procedure*** is observed in accordance with manufacturer's instructions. 2.2 ***System defects/Fault symptoms*** are identified using appropriate diagnostic software, tools and equipment in accordance with manufacturers' specifications. 2.3 Results of diagnosis and testing are documented completely. 2.4 Customers are advised/informed regarding the status and serviceability of the unit.
3. Maintain/Repair cellular phone unit	3.1 Defective parts/components are replaced/swapped with original parts according to manufacturers' specifications. 3.2 Repaired units are flashed using appropriate ***application software*** based on manufacturers' requirements. 3.3 Repaired or replaced parts/components are soldered/mounted in accordance with the current industry standards.

	3.4 Care and extreme precaution in handling the unit/product is observed as per procedures. 3.5 Cleaning of unit is performed in accordance with standard procedures.
4. Test repaired cellular phone	4.1 Repaired cellular phones are tested and cleaned in conformity with manufacturer's specifications. 4.2 Service completion procedures and documentations are complied based on manual.
5. Install additional features	5.1 ***Additional application software*** are installed to the unit based on customers' request and manufacturers' recommendation 5.2 Customers' are advised/oriented on the operation of additional features based on manufacturer's standards.

RANGE OF VARIABLES		
Variables	**Range** (Included but not limited to):	
1. Personal protective equipment	1.1 Working clothes/Apron 1.2 Face/Dust Mask 1.3 Goggles 1.4 Safety shoes	
2. Tools, Materials and Test Instruments:	2.1 Hot air soldering tool 2.2 Power Supply-variables 2.3 Soldering iron 2.4 De soldering tools 2.5 Tweezers 2.6 Screwdriver (assorted) 2.7 Signal generator - AF/RF 2.8 Multi-testers (analogue /digital) 2.9 Utility knife/stripper 2.10 Pliers (assorted) 2.11 Test jig	2.15 High-grade magnifying glass with lamp 2.16 Flashlight 2.17 Cleaning brush 2.18 Soldering lead 2.19 Cleaning agent 2.20 Wires 2.21 Silicon grease 2.22 Lubricants 2.23 Assorted electronic components

	2.12 Work bench 2.13 Bluetooth 2.14 Oscilloscope	2.24 Software Flasher 2.25 Board for rework 2.26 PC Computer 2.27 Infrared
3. Service manuals	3.1 Service manual/schematic diagram/parts list 3.2 Operating instructions/User's/Owner's manual 3.3 Repair handbooks for cellular phones	
4. Service Information	4.1 Job Report Sheets 4.2 Job Order 4.3 Bill of materials 4.4 Customer index 4.5 Service flowchart 4.6 Stock and inventory record 4.7 Requisition slips (for acquisition of parts) 4.8 Supplier Index	
5. Pre-testing procedures	5.1 Visual inspection of the unit with the power off 5.2 Interview of customer re history of unit 5.3 Operate the unit according to manual to confirm defects	
6. System defect/Fault symptoms	6.1 No power 6.1.1 Wet unit 6.1.2 Dropped unit 6.1.3 Over downloaded unit 6.1.4 System error 6.2 Contact service/contact retailer 6.3 No Signal 6.3.1 No transmission/reception 6.3.2 Intermittent signal 6.3.3 Shorted/grounded unit 6.4 Not charging 6.5 Defective User interface 6.5.1 Buzzer 6.5.2 Vibrator 6.5.3 Keypad 6.5.4 Backlights 6.5.5 Ear piece	

	6.5.6 Microphone 6.5.7 LCD problem 6.5.8 Camera problem 6.5.9 Bluetooth 6.5.10 Infrared 6.5.11 Radio 6.6 Software-related troubles 6.6.1 Hang-up 6.6.2 Virus 6.6.3 Four blinks / blinking display 6.6.4 Rebooting 6.6.5 Auto-shut-off
7. Application software	7.1 N-box 7.2 Tornado 7.3 Twister 7.4 Power flasher 7.5 Griffin
8. Additional Features	8.1 Enhancement 8.1.1 Backlights 8.1.2 Housing and accessories 8.1.3 Additional memory 8.2 Applications 8.2.1 Ring tones 8.2.2 Logos 8.2.3 Games 8.2.4 MP3/MP4 8.2.5 Wallpapers

EVIDENCE GUIDE	
1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Followed service manual specifications/instructions 1.2 Identified faults and defects according to required procedures 1.3 Informed the customer on the diagnosed defects 1.4 Replaced/swapped defective parts/components with original parts 1.5 Flashed repaired units using appropriate application software 1.6 Installed additional features as per customer demands
2. Underpinning knowledge	2.1 Fundamentals of electronic components and circuits 2.2 Fundamentals of digital logics. 2.3 Fundamentals of microprocessor of cell phone. 2.4 Analysis of troubles. 2.5 Fundamental of flashing process
3. Underpinning skills	3.1 Application of troubleshooting technique 3.2 Using and maintenance of test instruments, tools, & equipment 3.3 Interpreting schematic diagram. 3.4 Identifying system defects/Fault symptoms using appropriate diagnostic software 3.5 Replacing/swapping defective parts/components with original/identical parts 3.6 Installing additional applications 3.7 Testing repaired cellular phones. 3.8 Flashing repaired units using appropriate application software
4. Required Attitude	4.1 Commitment to occupational health and safety 4.2 Environmental concerns 4.3 Tidiness and timeliness 4.4 Respect for rights of peers and seniors in workplace
5. Resource implications	The following resources must be provided: 5.1 Work place 5.2 Tools, equipment and test instruments 5.3 Sufficient lighting and ventilation system 5.4 Cellular phone units 5.5 Service manuals/schematics 5.6 PC units and appropriate application software 5.7 Complete cellular phone spare parts and accessories

6. Method of assessment	Competency must be assessed :by- 6.1 Written test 6.2 Demonstration 6.3 Oral Questioning/Interview
7. Context of assessment	Participants must be assessed individually in the actual work place or in a simulated work place.

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National Technical and Vocational Qualification Framework for Bangladesh

Unit of Competence

Unit Code and Title	**LECONELE2019A1** Use Basic Control System.
Nominal Hours	**90**
Unit Descriptor	This unit convers knowledge, skill, and attitude required to use control devises and apply basic PLC operation
Element of Competency	**Performance Criteria** ***Bold & Italic*** terms are elaborated in the range of variables 1.1
1 Prepare for use control system	Safe work practices observed and personal protective Equipment are (PPE) worn as required for the work performed 1.2 ***Necessary tools and control devices*** are selected and prepared in line with job requirements. 1.3 ***Materials and components*** are identified required for control system.
2 Use control devices	2.1 Initial ***check-up*** of devices is conducted in accordance with user manual. 2.2 Necessary connections of control device with ***peripheral equipment*** are conducted according to plans/drawing instruction. 2.3 Devices are used as per manufacturer instruction. 2.4 Systems faults are identified during operation and minor repair is conducted according to the level of accuracy required. 3.1 The
3 Apply basic PLC operation	major section of PLC system are Identified as required for operation 3.2 Field and control devices are identified according to plans/drawing instruction 3.3 PLC operation program is set in accordance with the system function/ as per flow chart. 3.4 PLC System is operated in accordance with prescribed procedure. 3.5 Faults of Field and control devices are identified and repaired as required

RANGE OF VARIABLES	
Variables	**Range** (Included but not limited to):
1. Necessary Tools and control devices	1.1 Pliers; assorted 1.2 Screwdrivers; assorted 1.3 Wrenches; assorted 1.4 Multimeter 1.5 Calibrators 1.6 Flow meters 1.7 Pressure meter 1.8 Thermometer 1.9 Low voltage power supply (DC)
2. Control Device	2.1 PLC unit 2.2 Magnetic contactor 2.3 Temp controller 2.4 Level controller 2.5 Flow controller 2.6 Limit switch 2.7 Pressure Sensor 2.8 Timing relay 2.9 Starter 2.10 Inverter
3. Materials and components	3.1 Software for PLC 3.2 Wires 3.3 Terminal lugs 3.4 Terminal blocks 3.5 Terminal wire marker 3.6 Sensors a. Heat/temperature b. Pressure c. Flow d. Motion e. Proximity f. I R 3.7 Limit switches 3.8 Relays
4. check-up	4.1 Checking broken, burnt, sparking, short circuited, Over heated components of the product 4.2 Visual inspection of the unit with power off 4.3 Interviewing customer about history of the unit 4.4 Operate the unit according to manual to check for defects

5. Peripheral equipment	5.1 Motor 5.2 Pumps 5.3 MCB, MCCB, MPCB 5.4 Control switch

EVIDENCE GUIDE	
1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Identified control devices. 1.2 Identified peripheral equipment 1.3 Conducted connections of control device with *peripheral equipment* 1.4 Identified field and control devices 1.5 Conducted minor repair of system faults. 1.6 Used control system
2. Underpinning knowledge	2.1 Principles and operation of electronic control system 2.2 Function of Programmable Logic Controller(PLC) 2.3 Function of inverter.
3. Underpinning skills	3.1 Assembling & disassembling of control devices. 3.2 Connecting devices with power supply. 3.3 Handling materials, control devices 3.4 Connecting I/P, O/P and peripheral devices 3.5 Operating control devices 3.6 Identifying system faults 3.7 Repairing system faults
4. Required Attitude	4.1 Commitment to occupational health and safety 4.2 Environmental concerns 4.3 Tidiness and timeliness 4.4 Respect for rights of peers and seniors in workplace
5. Resource implications	The following resources must be provided. 5.1 Workplace 5.2 Equipment relevant to the proposed activity 5.3 All tools, equipment, material and documentation required 5.4 Relevant specifications or work instructions
6. Method of assessment	Competency must be assessed :by- 6.1 Written test 6.2 Demonstraion

	6.3 Oral Questioning/Interview
7. Context of assessment	Participants must be assessed individually in the actual work place or in a simulated work place.

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National Technical and Vocational Qualification Framework for Bangladesh

Unit of Competence

Unit Code and Title	**LECONELE3020A1** Maintain and Service Electronic-Controlled Office equipment
Nominal Hours	**100**
Unit Descriptor	This unit covers the knowledge, skills and attitudes required to maintain and service electronic controlled office equipment including diagnosing faults, reassembling, testing and preparing reports.
Element of Competency	**Performance Criteria** ***Bold & Italic*** terms are elaborated in the range of variables
1. Prepare for maintain and service	1.1 Safe work practices observed and personal proactive equipment (PPE) worn as required for the work place requirement. 1.2 Appropriate equipment are selected according to tasks requirements. 1.3 ***Testing tools, equipment*** and work place are prepared in line with job requirements. 1.4 ***Service manuals*** and ***service information*** required for repair/maintenance are acquired as per standard procedures.
2. Diagnose faults	2.1 Systematic ***pre-testing procedure*** is observed in accordance with manufacturer's instructions. 2.2 Defect/fault symptoms of ***appliances*** are identified using appropriate tools and equipment and in accordance with safety procedures 2.3 Circuits are checked and isolated using specified testing procedures 2.4 Control settings/adjustments are checked in conformity with service-manual specifications 2.5 Results of diagnosis and testing are documented completely 2.6 Customers are advised/informed regarding the status and serviceability of the unit as per procedures
3. Maintain and service appliances	3.1 Defective parts/components are replaced with identical or recommended appropriate equivalent ratings 3.2 Repaired or replaced parts/components are soldered/mounted in accordance with the current industry standards.

	3.3 Control settings/adjustments are performed in conformity with service-manual specifications 3.4 Care and extreme precaution in handling the unit/product is observed as per procedures
4. Test appliance	4.1 Repaired units are reassembled according to procedures 4.2 Reassembled units are subjected to final testing in conformity with manufacturer's specifications 4.3 Service completion procedures and documentations are complied with based on manual.
5. Clean and store tools and equipment	5.1 Waste materials are disposed of in accordance with environmental requirements. 5.2 Cleaning of equipment is performed in accordance with work site procedures 5.3 Tools and equipment are stored safely in appropriate location according to standard procedures

RANGE OF VARIABLES

Variable	**Range** (Included but not limited to):
1. Testing Tools and equipment	1.1 Pattern generator 1.2 Oscilloscope 1.3 Voltage stabilizer 1.4 DC power supply 1.5 Soldering iron/gun 1.6 Screwdriver (assorted) 1.7 Nut drivers (assorted) 1.8 Wrenches (assorted) 1.9 Multimeter (analogue/digital) 1.10 Utility knife 1.11 Wire stripper 1.12 Pliers (assorted) 1.13 Work bench
2. Service manuals	2.1 Service manual/schematic diagram/parts list 2.2 Operating instructions/User's/Owner's manual

3. Service Information	3.1 Job Report Sheets 3.2 Job Order 3.3 Bill of materials 3.4 Customer index 3.5 Service flowchart 3.6 Stock and inventory record 3.7 Requisition slips (for acquisition of parts) 3.8 Supplier Index
4. Pre-testing procedures	4.1 Visual inspection of the appliance with power off 4.2 Interview of customer on history of the appliance 4.3 Operate the appliance according to manual to confirm defects
5. Office equipment	5.1 Computer 5.2 Printer 5.3 Photocopier 5.4 Projector 5.5 Scanner 5.6 IPS and UPS **5.7** Dehumidifier and humidifier **5.8** LCD / LED Monitor

EVIDENCE GUIDE	
1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Prepared necessary tools, test instruments and personal protective equipment in line with job requirements. 1.2 Used safety rules and procedure 1.3 Carried out checking to Identify system defects/fault symptoms 1.4 Replaced defective parts/components with identical or recommended appropriate equivalent ratings 1.5 Performed control setting/adjustments in conformity with service manual specifications 1.6 Tested reassembled appliances to ensure proper functioning.
2. Underpinning knowledge	2.1 Basic electrical/ electronic circuit. 2.2 Fundamentals of electronic components and circuits of domestic appliances 2.3 Fundamentals of digital logic circuit.

	2.4 Fundamentals of operating system and settings 2.5 Fundamentals of microcontroller. 2.6 Fundamentals of solenoids, relays and motors 2.7 Fundamentals of remote control.
3. Underpinning skills	3.1 Application of troubleshooting technique 3.2 Using and maintenance of test instruments, tools, & equipment 3.3 Soldering/de soldering. 3.4 Checking to Identify system defects/fault symptoms 3.5 Replacing defective parts/components with identical or 3.6 recommended appropriate equivalent ratings 3.7 Performing control setting/adjustments
4. Required Attitude	4.1 Commitment to occupational health and safety 4.2 Environmental concerns 4.3 Tidiness and timeliness 4.4 Respect for rights of peers and seniors in workplace
5. Resource implications	The following resources must be provided. 5.1 Workplace 5.2 Materials relevant to the proposed activity 5.3 All tools, equipment, material and documentation required 5.4 Relevant specifications or work instructions
6. Method of assessment	Competency must be assessed :by- 6.1 Written test 6.2 Demonstration 6.3 Oral Questioning/Interview
7. Context of assessment	Participants must be assessed individually in the actual work place or in a simulated work place.

Accreditation Requirements

Training Providers must be accredited by Bangladesh Technical Education Board (BTEB), the national quality assurance body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of any national qualification.

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National Technical and Vocational Qualification Framework for Bangladesh

Unit of Competence

Unit Code & Title	**LECONELE 3021A1 Commission Consumer Electronics Appliances.**
Nominal Hours	**60**
Unit Descriptor	This unit covers the knowledge, skills and attitudes to commission consumer electronics product and system
Elements of Competency	**Performance Criteria** ***Bold & Italic*** terms are elaborated in the range of variables
1. Interpret work instructions	1.1 Safe work practices observed and personal proactive equipment (PPE) worn as required for the work place requirement. 1.2 Appropriate ***Tools and equipment*** are selected according to tasks requirements. 1.3 Communication skills to interpret work instructions are demonstrated according to the established procedures 1.4 Work signs, symbols and conventions are explained according to as per manufacturer's instruction 1.5 Work instructions and procedures are demonstrated according to as per manufacturer's instruction
2. Identify tools, equipment, testing devices and materials	2.1 Materials needed for commissioning are identified and prepared according to the work instructions 2.2 Tools and equipment types and functions needed for commissioning are identified and demonstrated according to its uses 2.3 Testing devices and instruments operations needed for commissioning are explained and demonstrated according to instruction manual
3. Commission consumer electronic products	***3.1*** Commissioning is performed and done using specified procedures mentioned in ***manual and drawing.*** 3.2 Work is performed in accordance with requirements without damage to the surrounding environment or services 3.3 Unplanned events or conditions are responded to in accordance with established procedures

4. Check commissioning activity	4.1 ***Commissioned systems*** are verified according to established procedures. 4.2 Commissioned systems are checked to insure safety. 4.3 Report is prepared and completed according to company procedures.

RANGE OF VARIABLES

Variables	**Range** (Included but not limited to):
1. Tools and equipment	1.1 Soldering iron/gun 1.2 Screwdriver (assorted) 1.3 Utility knife/stripper 1.4 Pliers (assorted) 1.5 Test jig 1.6 Magnifying glass with stand 1.7 Cleaning brush 1.8 Cleaning agent 1.9 Wires 1.10 Assorted electronic components 1.11 Work bench with mirror Pliers (assorted) 1.12 Wrenches 1.13 Communication equipment [2-way radio, cell phone] 1.14 Lifting equipment 1.15 Fastening equipment 1.16 Multimeter 1.17 Calibrators
2. Manuals, drawing and material	2.1 Diagram/manuals and other repair references of consumer electronic product and systems 2.2 Electronic supplies 2.3 Component manufacturers manual 2.4 Engineering specifications 2.5 Learning elements 2.6 Catalogue/reference materials
3. Commissioning Process	3.1 Supplies, Materials and equipment preparation 3.2 Familiarize with the diagram and the product 3.3 Perform Commissioning 3.4 Check Commissioning

EVIDENCE GUIDE	
1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Applied procedures and technique for commissioning. 1.2 Commissioned the appliances according to specific requirements 1.3 Conducted performance check of commissioned machine
2. Underpinning knowledge	2.1 Work signs, symbols and conventions 2.2 Work instruction interpretation 2.3 Commissioning techniques and procedure
3. Underpinning skills	3.1 Using and maintenance of tools and equipment 3.2 Applying the techniques of commissioning electronics product 3.3 Using the process to check commissioning activity 3.4 Report writing and documentation.
4. Required Attitude	4.1 Commitment to occupational health and safety 4.2 Environmental concerns 4.3 Eagerness to learn 4.4 Tidiness and timeliness 4.5 Respect for rights of peers and seniors in workplace
5. Resource implications	5.1 Work place 5.2 Materials relevant to the proposed activity 5.3 All tools, equipment, material and documentation required 5.4 Relevant specifications or work instructions
6. Method of assessment	Competency must be assessed through: 6.1 Written Test 6.2 Demonstration 6.3 Oral Questioning/Interview
7. Context of assessment	Competencies may be assessed in the work place or in a simulated work place.

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