ELMS

Establishing an Employer led Labour Market Secretariat

With support from dakchyata TVET PRACTICAL PARTNERSHIP

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Nepal Industrial and Business Sector
Occupational Standard (OS)
of
Electrician Level-2

In jointly implemented by

FNCCI FNCSI

Occupational classification linkage with NSCO

Occupational Title:	**Electrician**
Level:	**2 (Foreman Level)**
Sector:	**Construction**
Sub – Sector:	**Associated to construction**
OSS ID No:	**CT-003-078**
Major Group:	**7**
Sub-major Group:	**74**
Minor Group:	**741**
Unit Group:	**7411**

Occupation Specific Employers Panel:

S.N.	Name	Designation	Organization
1.	Mr. Karan Ayer	Electrician Level 2/Owner	Ayer Electrical Store, Pipal chautara, Hasanpur, Dhangadi -5
2.	Mr. Madhav Pd. Acharya	Proprietor	Acharya Electric Service Centre, Matepani, Pokhara -12, Kaski
3.	Mr. Gangadhar Padhya	Proprietor	Aatreya Electrical or Plumbing Service Centre, Butwal -10, Rupandehi
4.	Mr. Bhai Raja Shrestha	Managing Director/Associate advisor	B & KDS Construction Pvt. Ltd./ Federation of Nepal Construction Entrepreneurs, Kathmandu -3, Bagmati
5.	Mr. Laxman Raut Kurmi	Director	Radhemai Nirman Sewa, Masihani -5, Parsa
6.	Er. Udit Narayan Ray	Managing Director	Udit Construction & Reshu Real state, Janakpur - 3, Dhanusha
7.	Mr. Ramsewak Mahato	Engineer	Ujjwal Nirman Sewa, Jaganathpur-6, Parsa
8.	Mr. Bhaktaraj Dhami	Proprietor	Sivam Power Engineering Febricators, Biratnagar -10, Morang
9.	Mr. Sanjaya Shrestha	Electrician/owner	Soniya Electrics, Salyan -2
10.	Mr. Mahamad Alam Dewan	Proprietor	New Sunny Construction, Birgunj -16, Parsa
11.	Mr. Ashok Kumar Pandit	Service In charge/ Electrician	Usha Care Pvt. Ltd., Janakinagar, Janakpur-7, Dhanusha
12.			

Occupation Specific Expert Workers Panel:

S.N.	Name	Designation	Organization
1.	Mr. Rajesh Mahato	Electrician Supervisor	Usha Care Service Center, Janakpur-24, Dhanusha
2.	Mr. Prakash Dulal	Electrical Supervisor/ Secretary	Tripura Construction/ Nepal Electrician Association, Godawari, Lalitpur-13, Bagmati
3.	Mr. Tuk Lal Tiwari	Electrician	Namaste Nirman Sewa, Sarada-1, Salyan
4.	Mr. Tulsi Ram Panthi (Kamal)	Electrician	Prabhu Dewa Nirman Sewa, Ghorahi-13, Dang, Lumbini
5.	Mr. Raj Kumar Shrestha	Electrician	Aryal Electrical Pasal, Gorkha-8, Gandaki
6.	Er. Fariyad Bnsari	Electrical Engineer	Rungta Group of Industries, Birgunj-7, Parsa
7.	Er. Tahur Ansari	Electrical Engineer	Pro Bio-Tech Industries Ltd., Lipani, Birgunj -24, Parsa
8.	Er. Rahul Kumar Jha	Senior Electrical Engineer	Udit Construction & Consultancy Pvt. Ltd., Janakpur-13, Dhanusha
9.	Mr. Dhirendra Pd. Jaiswal	Electrical Supervisor	Suman Nirman Sewa, Maha Ghadhi Mai-5, Bara
10.	Mr. Dipak Bohara	Electrician	Ayer Electronics, Dhangadi-5, Seti
11.	Mr. Binod Dhami	Electrical worker	Shivam Power Fab Engineering, Biratnagar-10, Morang
12.	Mr. Suresh Padit	Electrician	Kadambari Construction, Birgunj-14, Parsa

OS Development Workshop facilitated by:

S.N.	Name	Designation	Organization
1.	Raju Bajracharya	Facilitator	Freelance
2.	Yubak Raj Ghimire	Co-facilitator/Recorder	Freelancer

OS Reviewed by ELMS Construction Sector Working Group:

S.N.	Name	Designation	Representation (Organization)
1.	Mr. Gore Sherpa	General Secretary	FNCCI (IPAAN)
2.	Mr. Saurav Sharma	Member	CNI
3.	Mr. Satya Narayan Prajapati	Treasurer	FNCSI
4.	Mr. Santosh Shah	Executive board member	FCAN
5.	Mr. Ramesh Man Shakya	Construction Sector Expert	ELMS

OS Verified by ELMS Technical Advisory Committee:

S.N.	Name	Designation	Organization
1.	Dr. Mahesh Nath Parajuli	Professor	KU
2.	Mr. Kul Bahadur Phadera	Under secretary	MoEST
3.	Mr. Pravat Uprety	Associate Professor	TU
4.	Mr. Kishor KC	Statistics Officer	CBS
5.	Ms. Sharada Ghimire	Deputy Director	CTEVT, Curriculum Division
6.	Mr. Keshab Ghimire	Deputy Director	CTEVT, NSTB

OS Recommended by ELMS Coordination Committee:

S.N.	Name	Designation	Organization
1.	Mr. Rabin Kumar Shrestha	Focal Person/Ex EC Member	FNCCI
2.	Mr. Sumit Kumar Kedia	Executive Committee Member	FNCCI
3.	Mr. Birendra Raj Pandey	Vice President	CNI
4.	Ms. Megh Nath Neupane	Senior Consultant	CNI
5.	Ms. Shobha Gurung	Vice President	FNCSI
6.	Mr. Mohan Katuwal	Vice President	FNCSI
7.	Mr. Binayak Shah	Senior Vice President	HAN
8.	Mr. Sajan Shakya	Secretary General	HAN
9.	Mr. Nicholas Pandey	Senior Vice President	FCAN
10.	Mr. Roshan Dahal	General Secretary	FCAN

OS Approved by ELMS Board:

S.N.	Name	Designation	Organization
1.	Mr. Shekhar Golchha	President	FNCCI
2.	Mr. Vishnu Kumar Agarwal	President	CNI
3.	Mr. Shyam Prasad Giri	President	FNCSI
4.	Ms. Srijana Rana	President	HAN
5.	Mr. Rabi Singh	President	FCAN
6.	Mr. Chandra Kanta Adhikari	Member Secretary	ELMS

Occupational Description:

The electrician is a tradesman who specializes in installing, commissioning, replacing, and maintaining electrical systems in residential, commercial, and industrial buildings. An electrician has a responsibility to work professionally to meet customer needs and maintain relationships. Electrical installation is closely associated with other sectors of the construction industry and with the many supporting products, normally for commercial purposes.

The electrician works both inside and outside of the projects and companies, in teams, and in buildings of customers. They will plan and design, select and install, commission, test, report, maintain, troubleshoot, and repair systems to the highest standards. Outstanding electricians possess an understanding of work organization, self-management, communication, interpersonal skills, problem solving, flexibility, and occupational safety.

In the constant development of technology, an electrician will have to deal with new challenges where updated systems will be required and updated working methods will be necessary. Electricians work alone or in teams, taking on a high level of personal responsibility and autonomy. Safe and reliable electrical installation and maintenance services in accordance with relevant standards, diagnosing malfunctions, or installing home and building security systems, concentration, precision, and accuracy are essential skill and responsibilities of electricians and mistakes during performances can lead to life-threatening consequences.

The occupation **Electrician Level-2 (Foreman Level)** describes the individual with required knowledge for applying basic method of performance, knowledge to select tools, equipment and materials appropriate for the given task. He/she possess the ability to apply basic theory and principle of the common duties and tasks to solve the given assignment. Further, the Electrician has ability to act independently in simple core skills and can work under the supervision of supervisor for some higher level of tasks to ensure the technicality as a co-worker. This individual has to operate hand power machines and supervises assistant worker and labour in the team. Nepal's industrial and business sector expects individual reserving set level of skills, knowledge and attitudes which reflect for the improvement of production/services and workers' productivity.

Occupational and environmental safety:

It is well known that electrical hazards can cause serious injuries, fatalities, and property damage. Working in the electrical industry exposes workers to shocks and injuries from arc flash burns, leakage current shocks, fine dust from different work materials, and injuries from cutting and grinding brick and concrete walls. The injury can result in traumatic fatalities, scarring in the lungs as well as coughing and shortness of breath. Death and loss of property are its most disastrous effects. Due to its high sound levels and dust composition while wall grooving, polluted dust should be collected in a dust collector. Thus, personal protective equipment, such as face masks, earplugs, helmets, safety gloves, safety glasses, overalls, and high visibility safety vests should be worn by every electrician during measuring, marking, wall grooving, wire laying, cable terminal connection, fixing electrical fixtures, sub-station work, drilling and grinding on a construction site.

Minimum Job Entry Requirement:

As per the labour law the Nepalese citizen aged 18 years and above and competent as per this occupation standards are eligible to enter in this occupation. To cope the required knowledge and tasks performance standard of this occupation 10th grade graduates or equivalent qualification are recommended to enter in the skills and knowledge impartation courses.

Worker's traits:

The desired workers traits for the electrical work needs mentally and physically fit and strong, having good sense of humor, disciplined and positive attitudes, prompt responsive to the assignment, good team players, high level of passionate, courteous, can be enjoyed to work with electrical wirings, electrical appliances to install, replace and maintain electrical systems of industries, commercial and residential building with electrical hand and power tools and equipment. Further, creative in apparatus selection and installation, emergency problem resolving of short circuits and electrical leakages and replacement of damaged electrical fixtures. Additionally, individual having friendly behaviors, good interpersonal skills and exhibiting strong organizational loyalty and professional ethics with learning attitudes are essential attributes needed to enter in this occupation.

Occupational carrier path:

- **Above the Position-** Senior Electrician – level 3 (Supervisor Level)
- **Current Position-** Electrician – level 2 (Forman Level)
- **Below the Position-** Junior Electrician – level 1 (Assistant Level)

Abbreviation used:

Task Level		Rating number and their meaning
Significance	:	1- Important; 2-Moderately important; 3-Highly important
Ease	:	1- Easy; 2-Moderately easy; 3- Very easy
Occurrence	:	1-Rarely occurred; 2-Moderately occurred; 3-Frequently occurred

N/A	:	Not Applicable
OS	:	Occupation Standard
FNCCI	:	Federation of Nepalese Chambers of Commerce & Industry
CNI	:	Confederation of Nepalese Industries
FNCSI	:	Federation of Nepali Cottage & Small Industries
FCAN	:	Federation of Contractors' Associations of Nepal
HAN	:	Hotel Association Nepal
ELMS	:	Employers Led Market Secretariat
SWG	:	Sector Working Group
TAC	:	Technical Advisory Committee

SOP	:	Standard Operating Procedure
KU	:	Kathmandu University
MoEST	:	Ministry of Education, Science & Technology
TU	:	Tribhuvan University
CBS	:	Central Bureau of Statics
CTEVT	:	Council of Technical Education and Vocational Training
NSTB	:	National Skill Testing Board
Div.	:	Division
PPE	:	Personal Protective Equipment
IT	:	Information Technology
NSIC	:	National Standard of Integrated Circuit
CV	:	Curriculum Vitae
RPM	:	Revolutions per Minute
MPM	:	Metre per Minute
TCT	:	Tungsten Carbide Tipped
HSS	:	High Speed Steel
DB	:	Distribution Box
PVC	:	Polyvinyl Chloride
MMR	:	Make My Room
DND	:	Do Not Disturb
AC	:	Air Condition
DOL	:	Direct On Line
VFD	:	Variable Frequency Drive
PCC	:	Plain Cement Concrete
GI	:	Galvanized Iron
MCB	:	Miniature Circuit Breaker
ATS	:	Auto Transfer Switch
UPS	:	Uninterruptible Power Supply
DC	:	Direct Current
SE	:	South East
DVR	:	Digital Video Recorder
NVR	:	Network Video Recorder
CCTV	:	Closed Circuit Television
FACP	:	Fire Alarm Control Panel
MCP	:	Manual Call Point
ISO	:	International Organization of Standardization
CAT-6	:	Category 6 cable
PABX	:	Private Automated Branch Exchange
LAN	:	Local Area Network
APFC	:	Automatic Power Factor Control Panels
ToD metre	:	Time of Day metre
HV	:	High Voltage
LV	:	Low Voltage
VCB	:	Vacuum Circuit Breaker
APFC	:	Automatic Power Factor Connection
PLC:	:	Automatic Power Factor Control Panels
MPCB	:	Motor Protection Circuit Breaker

List of Duties and Tasks of the Electrician: Level-2 (Foreman Level)

Soft Skills Area			
SN	**Duty statements**	**Task No**	**Task statements**
1.	Demonstrate Positive Attitudes	1.	Manage time for occupational assignment
		2.	Exhibit empathy with customer and team members
		3.	Apply the work ethics of electrician
		4.	Respond assignment
		5.	Give/ Receive feedback and feed forward
2.	Exhibit Interpersonal Skills	6.	Listen customers' demands, complaints and other information
		7.	Communicate with others about products and services
		8.	Coordinate with customers, team members and stakeholders
		9.	Perform net-working with customers, team and stakeholders
3.	Demonstrate Occupational Leadership	10.	Exhibit behavior of team player among the members
		11.	Make decision at different situation of the occupation
		12.	Solve problem encountered in the occupation
		13.	Take responsibility and accountability of the assignment
		14.	Develop work plan of electrician
Core Skills Area			
SN	**Duty statements**	**Task No**	**Task statements**
4.	Perform professionalism	15.	Familiarize with labour law
		16.	Read the agreement paper.
		17.	Use IT for career development
5.	Deal with customer	18.	Visit work site
		19.	Capture the demand of customer
		20.	Present qualities and experiences to the customer
6.	Interpret drawing	21.	Interpret layout diagram
		22.	Prepare wiring diagram
7.	Plan electrical installation work	23.	Prepare work schedule
		24.	Plan for team members
		25.	Plan for required materials, tools and equipment
8.	Manage electrical material	26.	Verify the electrical materials
		27.	Store electrical materials
9.	Operate tools and equipment	28.	Prepare working platform
		29.	Conduct safety meeting
		30.	Operate multi-meter
		31.	Operate Tacho-meter
		32.	Drill a hole using hand drilling machine
		33.	Cut a material using angle grinder machine
		34.	Crimp cable lugs using crimping tool
		35.	Measure current value using clamp meter
		36.	Measure earthing value using megger
		37.	Solder with an electric soldering iron
10.	Install electrical fitting and fixtures	38.	Mark a line on wall/floor for electric wiring
		39.	Perform wall grooving
		40.	Lay PVC pipe
		41.	Mount join/junction box
		42.	Perform cable pulling/laying
		43.	Install switch gears
		44.	Install electrical fixtures and appliances (lighting fixtures, bell, buzzer, ceiling fan, adjustable fan, exhaust fan etc.)
		45.	Install sub-energy meter

11.	Install electrical motor and control	46. 47.	Install single phase motor and control system. Install three phase motor and control system
12.	Perform earthing work	48. 49. 50. 51.	Perform plate earthing Perform pipe earthing Perform rod earthing Perform chemical earthing
13.	Install power back-up system	52. 53. 54. 55. 56.	Install generator Install inverter/UPS Install solar back-up system Install battery bank (battery charging system) Install electrical security system (thumb reader, door lock, fire alarm system)
14. 15.	Install and operate of networking security system Install and control sub-station equipment	57. 58.	Install networking system (DVR/NVR CCTV, PABX) Install sub-station equipment (pole transformer, voltage metering unit, APFC lighting arrestor)
16.	Perform testing and commissioning of installation work	59. 60. 61. 62. 63. 64. 65.	Monitor electrical works Perform continuity test Perform insulation resistance test Test cable terminates (for leakage & tightness) Perform earthing test Test transformer and equipment Perform RPM test
17.	Repair and basic maintenance work	66. 67.	Perform schedule maintenance Perform breakdown maintenance

Task Competency Standard

Soft Skills Area:			
Task number:	**1**		
Task statement:	**Manage time for occupational assignment**		
Level of task:	Significance	Ease	Occurence
	3	2	3
Terminal performance standard	**Given Condition** • Regular duty hours and work plan **Task:** Manage time for occupational assignment **Time:** N/A **Standard/Criteria:** • The daily work is started and ended as per given work plan (exhibited punctuality), • The work activities are performed as per the given work plan, • The task is completed within the given time frame.		
Related technical knowledge	• Meaning and importance of time management, • Work priority and rescheduling as per the urgency, • Points to be consider while managing time during duty hours.		

Task number:	**2**		
Task statement:	**Exhibit empathy with customers and team members**		
Level of task:	Significance	Ease	Occurence
	2	2	1
Terminal performance standard	**Given Condition** • Any incident (Problems, awkward situation or unusual situation) of customer or team members **Task:** Exhibit empathy with customers and team members **Time:** N/A **Standard/Criteria:** • Feelings (body language, gesture, posture, facial expression) are expressed as per the given incident during the performance; • Acted accordingly as per the feelings.		
Related technical knowledge	• Meaning and importance empathy; • Different situations for empathy; • Points to be considered while exhibiting empathy.		

Task number:	**3**		
Task statement:	**Apply the work ethics of the electrician**		
Level of task:	Significance	Ease	Occurence
	3	2	3
Terminal performance standard	**Given Condition:** • Occupational ethics and code of conduct of organization or Standard operating procedure (SOP) **Task:** Apply the work ethics of the electrician **Time:** N/A **Standard/Criteria:** • Organisational Code of conduct and occupational ethics are followed; • Standard Operating Procedure (SOP) is followed; • The confidentiality of the information is maintained; • The performer is satisfied and motivated in the occupation.		
Related technical knowledge	• Meaning and importance of work ethics; • Occupational work ethics; • Code of conducts of organization or SOP.		

Task number:	4		
Task statement:	**Respond assignment**		
Level of task:	Significance	Ease	Occurrence
	3	2	3
Terminal performance standard	**Given Condition:** • Any assignment or task order **Task:** Respond assignment **Time:** N/A **Standard/Criteria:** • The task is responded promptly; • The given assignment is noted; • The given assignment is completed within the agreed time.		
Related technical knowledge	• Types of work and urgency; • Importance of timely response; • Time requirement of given assignment; • Methods of dealing with stakeholders.		

Task number:	5		
Task statement:	**Give/Receive feedback and feed forward**		
Level of task:	Significance	Ease	Occurrence
	3	2	3
Terminal performance standard	**Given Condition** • Any assignment or task order **Task:** Give/Receive feedback and feed forward **Time:** N/A **Standard/Criteria:** • The feedback is listened actively; • The feedback and feed forward given is noted; • Feedback is started with positive part of the performance; • Constructive feedback is given objectively and specific; • Digestible amount of feedback is given.		
Related technical knowledge	• Meaning and importance of feed forward and feedback; • Types of feedback; • Techniques of giving and receiving feed forward and feedback.		

Task number:	6		
Task statement:	**Listen customers demand, complaints or others information**		
Level of task:	Significance	Ease	Occurrence
	3	2	3
Terminal performance standard	**Given Condition** • Customer or team member is complaining / reporting/providing other information **Task:** Listen customers demand, complaints or others information **Time:** N/A **Standard/Criteria:** • Complaints/ demand and information is listened actively; • Response (nodding the head) is exhibited during active listening; • Questions are asked for clarification; • Complaints/demands and/or other information are clearly noted; • Reporter or complainant is satisfied with electrician's listening skills.		
Related technical knowledge	• Importance of active listening; • Differences between active listening and hearing; • Techniques of active listening.		

Task No:	7		
Task statement:	**Communicate with others about products and services**		
Level of task:	Significance	Ease	Occurrence
	3	2	3
Terminal performance standard	**Given Condition** • Information about products and services to be communicated; • Audience or stakeholders **Task:** Communicate with others about products and services **Time:** N/A **Standard/Criteria:** • Voice is clear, pleasant and audible; • Visual expressions are natural; • Information communicated is concise and complete.		
Related technical knowledge	• Meaning and importance of effective communication; • Effective communication model; • Types and means of communication; • Techniques of effective communication.		

Task number:	8		
Task statement:	**Coordinate with customers, team members and stakeholders**		
Level of task:	Significance	Ease	Occurrence
	3	2	3
Terminal performance standard	**Given Condition** • Agenda or issue or information to be coordinated; • Team members or relevant stakeholders and • Means of coordination. **Task:** Coordinate with customers, team members and stakeholders **Time:** N/A **Standard/Criteria:** • The given agenda, issues or information is shared with respective customers, team members and stakeholders; • The customers, team members and stakeholders are identified as per given the target receivers; • Coordination is done based on the given means of coordination.		
Related technical knowledge	• Meaning and importance coordination; • Means of coordination; • Techniques of effective coordination.		

Task number:	9		
Task statement:	**Perform net-working with customers, team and stakeholders**		
Level of task:	Significance	Ease	Occurrence
	3	1	2
Terminal performance standard	**Given Condition:** • Assignment and job description. **Task:** Perform net-working with customers, team and stakeholders **Time:** N/A **Standard/Criteria:** • List of customers and stakeholders are prepared; • Necessary communication and coordination are made with customers, team and stakeholders; • Service delivery met the standard of the organization; • Additional service procurement is easily available.		
Related technical knowledge	• Meaning and importance of networking; • Means of networking; • Techniques of effective networking.		

Task number:	10		
Task statement:	**Exhibit behavior of team player among the members**		
Level of task:	Significance	Ease	Occurrence
	2	1	2
Terminal performance standard	**Given Condition:** • Assignment and • Working team. **Task:** Exhibit behavior of team player among the members **Time:** N/A **Standard/Criteria:** • Team members are encouraged; • Ownership of the work is taken collectively; • Cooperative and assertiveness are possessed in the team; • Responsibilities and accountabilities are taken.		
Related technical knowledge	• Meaning and importance of team work; • Characteristics of good team player; • Phases of team formation; • Tips of effective team work.		

Task number:	11		
Task statement:	**Make decision at different situation of the occupation**		
Level of task:	Significance	Ease	Occurrence
	3	3	3
Terminal performance standard	**Given Condition:** • Any assignment with possible unusual situation during the process and Problem or case and time frame **Task:** Make decision at different situation of the occupation **Time:** N/A **Standard/Criteria:** • Decision is taken within given time frame; • Desired result is achieved; • Decision has considered efficient use of time, money and resources.		
Related technical knowledge	• Meaning and importance of decision making; • Simple decision making process.		

Task number:	12		
Task statement:	**Solve problem encountered in the occupation**		
Level of task:	Significance	Ease	Occurrence
	3	3	3
Terminal performance standard	**Given Condition:** • Any problem or case and time frame **Task:** Solve problem encountered in the occupation **Time:** N/A **Standard/Criteria:** • Problem is analyzed; • Possible solutions are identified; • Effective solution is selected; • Solution has considered efficient use of time, money and resources; • Problem is solved in given time frame; • Desired result is achieved.		
Related technical knowledge	• Meaning and importance of problem solving; • List of potential problems in electricity; • General problem solving techniques.		

Task number:	**13**		
Task statement:	**Take responsibility and accountability of the assignment**		
Level of task:	Significance	Ease	Occurrence
	3	2	3
Terminal performance standard	**Given Condition:** • Assignment; • Job description **Task:** Take responsibility and accountability of the assignment **Time:** N/A **Standard/Criteria:** • All team members exhibited dedication to the assignment; • All team members exhibited dedication to the assignment; • Every member has taken their respective responsibilities and attempted to complete the assignment; • The assignment is completed in time; • The ownership of the results of the assignment are taken collectively.		
Related technical knowledge	• Meaning of responsibility and accountability; • Importance of responsibility and accountability for electrician.		

Task No:	**14**		
Task statement:	**Develop work plan of electrician**		
Level of task:	Significance	Ease	Occurrence
	3	2	3
Terminal performance standard	**Given Condition:** • List of tasks and their priority order; • Planning forms and format; • Job description. **Task:** Develop work plan of electrician **Time:** N/A **Standard/Criteria:** • Plan is developed as per given task; • Planning is done in given forms and formats; • Activities are listed sequentially in the given forms and format; • The start time and end time of every activity is mentioned; • The responsible person for the activity is mentioned in the plan; • The work plan has considered efficient use of resources (time, money, and people).		
Related technical knowledge	• Meaning of planning; • Importance of planning; • Different planning tools; • Points to be considered while planning.		

Core Skills Area			
Task number:	**15.**		
Task statement:	**Familiarize with labour law**		
Level of task:	Significance	Ease	Occurrence
	3	2	1
Terminal performance standard	**Given Condition** • Labour law of Nepal Government; • Incident occurred. **Task:** Familiarize with labour law. **Time:** Depends on the individual understanding and interpretation of the points in the labour law. **Standard/Criteria:** • The rights, duties tasks and responsibilities of workers (electrician) are interpreted; • The electricians are aware with the provisions made in the labour law.		
Related technical knowledge	• Definition of labour and labour law in Nepal; • Interpretation of duties, rights, responsibilities and benefits incorporated in labour law; • Importance of labour law.		
Safety/precaution	• Interpret the labour law correctly.		
Tools, equipment and materials	• Nepal government labour act and labour law.		

Task number:	**16.**		
Task statement:	**Read the agreement paper**		
Level of task:	Significance	Ease	Occurrence
	3	2	1
Terminal performance standard	**Given Condition** • After final deal with customer; • Agreement ready for signature. **Task:** Read the agreement paper. **Time:** 5 minutes /agreement **Standard/Criteria:** • All agreement points are read and interpreted; • Scope of work, duration and dead line of the works, mode of payment and responsibilities of the both parties are read and agreed; • Signature of authorised person of both parties and witnesses with seal.is confirmed in the agreement paper.		
Related technical knowledge	• Definition of agreement; • Types of agreement; • Components and major contents needed to be considered in agreement; • Importance of witness, seal and signatures in the agreement.		
Safety/precaution	• Keep the signed agreement document safely.		
Tools, equipment and materials	• Standard format of agreement (if any); • Reference document (business law, finance regulation).		

Task number:	17.		
Task statement:	**Use IT for career development**		
Level of task:	Significance	Ease	Occurrence
	3	3	3
Terminal performance standard	**Given Condition** • Additional or new Information required; • References; • Creativity in work is required IT facilitates (computer with internet connection). **Task:** Use IT for career development. **Time:** N/A (depends on the information required to be searched and downloaded). **Standard/Criteria:** • Text and visual information are searched and downloaded using IT facilities; • The downloaded materials are used in the job and for self-career development.		
Related technical knowledge	• Internet and its use for finding the required information; • Information about websites, information search engines and procedures; • Operation (searching, downloading, saving/storing and printing information) through internet/mobile/laptop; • Virus and use of antivirus software for protecting the downloaded documents.		
Safety/precaution	• Store the soft copy back up of information/ downloaded documents safely in computers; • Make sure IT devices (computer/laptops) are protected with updated Antivirus software; • Handle and operate the IT devices (laptop, mobile, printers etc.) safely.		
Tools, equipment and materials	• IT devices (mobile/laptop with internet connection & Wi-Fi, printer, external storing devices etc.).		

Task number:	18.		
Task statement:	**Visit work site**		
Level of task:	Significance	Ease	Occurrence
	3	2	2
Terminal performance standard	**Given Condition** • Customer request; • Drawing; • Advertisement; • Work site or Location. **Task:** Visit work site. **Time:** 120 minutes /working site. **Standard/Criteria:** • Given site is visited for collecting information prior commencement of work; • Basic information related to electrical is collected and noted from the site visit; • Necessary measurements are taken if required; • Necessary photograph of the site are taken.		
Related technical knowledge	• Measurement and taking linear measurement; • Photographs and its importance; • Points needed to be considered while taking photographs at site; • Operation of camera/mobile; • Electrical sign & symbol used in drawing.		
Safety/precaution	• Apply PPE (safety shoes & helmet).		
Tools, equipment and materials	• Camera; • Measuring tape.		

Task number:	19.		
Task statement:	**Capture the demand of customer**		
Level of task:	Significance	Ease	Occurrence
	3	2	1
Terminal performance standard	**Given Condition** • Layout drawing; • Customer requirement. **Task:** Capture the demand of customer. **Time:** 60 minutes /customer. **Standard/Criteria:** • Customer requirement is listened carefully; • Sketch is prepared addressing the concept and customer requirement; • Customer is satisfied with your sketch presentation; • Further information regarding the job execute is collected.		
Related technical knowledge	• Overview of NSIC (National Standard of Integrated Circuit); • Layout diagram and sketching; • Visualising customer requirement through sketch; • Layout drawing interpretation; • Effective presentation of the concept and customer requirement.		
Safety/precaution	• Make sure all customer requirement are considered.		
Tools, equipment and materials	• List of customer requirement; • Layout diagram, blank paper with pencil and eraser for sketching.		

Task number:	20.		
Task statement:	**Present qualities and experiences to the customer**		
Level of task:	Significance	Ease	Occurrence
	3	2	1
Terminal performance standard	**Given Condition** • CV with job profile; • Request for presentation; • Presentation time 20 min. **Task:** Present qualities and experiences to the customer. **Time:** 60 minutes /presentation. **Standard/Criteria:** • All qualities and experiences including additional required information are presented; • Related information, qualities and experiences presented are matched with the information in the given CV; • Presentation is completed within the given time.		
Related technical knowledge	• Definition of Curriculum vitae (CV), its importance and use; • CV content and its preparation; • CV presentation; • .Qualities and experiences of person and its importance in the work.		
Safety/precaution	• N/A		
Tools, equipment and materials	• Reference materials of qualities and experiences		

Task number:	21.		
Task statement:	**Interpret layout diagram**		
Level of task:	Significance	Ease	Occurrence
	3	3	3
Terminal performance standard	**Given Condition** • Layout diagram. **Task:** Interpret layout diagram. **Time:** 30 minutes /Layout diagram **Standard/Criteria:** • The measurements in the given layout diagram is explained; • The sign, symbol, code in the given layout diagram is described with all details; • Extra information if required is described and included in layout diagram.		
Related technical knowledge	• Drawing, types and its use; • Layout diagram and its components; • Measurements in the layout diagram; • Meaning of electrical sign and symbols and standard colour codes.		
Safety/precaution	• Interpret all sign, symbols and colour codes in the layout diagram correctly.		
Tools, equipment and materials	• Layout diagram, engineering scale, Hand book with signs, symbols and colours used in electrical sector and their meaning.		

Task number:	22.		
Task statement:	**Prepare wiring diagram**		
Level of task:	Significance	Ease	Occurrence
	2	2	2
Terminal performance standard	**Given Condition** • Layout diagram; • Specific requirement of customer. **Task:** Prepare wiring diagram. **Time:** 60 minutes /diagram. **Standard/Criteria:** • Wiring diagram is prepared based on layout diagram; • Customer requirement is considered and addressed in the wiring diagram; • Wiring diagram is prepared following all electrical standard signs, symbols and colour codes.		
Related technical knowledge	• Meaning of electrical wiring and its types; • Different signs, symbols and colour codes and their meanings in electrical wiring; • Procedure for preparing wiring diagram.		
Safety/precaution	• Use correct standard electrical signs, symbols and colour codes in the wiring diagram.		
Tools, equipment and materials	• Standard size drawing paper; • Ruler; • Pencil/eraser/sharpener; • List of electrical signs, symbols and colour codes with its meaning.		

Task number:	23.		
Task statement:	Prepare work schedule		
Level of task:	Significance	Ease	Occurrence
	3	2	2
Terminal performance standard	**Given Condition** • Layout drawing; • Agreement; • Site visit note. **Task:** Prepare work schedule. **Time:** 120 minutes /schedule. **Standard/Criteria:** • All electrical activities are listed out sequentially from the given layout drawing and site visit notes; • All activities are assigned with start and end date; • Responsible person for the respective activity is mentioned; • Total work schedule duration is matched with given time duration mentioned in the agreement; • The prepared work schedule is agreed and approved.		
Related technical knowledge	• Meaning of work schedule, its importance and uses; • Preparation of work schedule; • Electrical activities, estimated time requirement to accomplish each activity; • Introduction of different software (Word/Excel).		
Safety/precaution	• Each and every activities are listed sequentially and toil time duration is matched with the agreed time duration in the agreement.		
Tools, equipment and materials	• Computer/laptop/mobile. • Layout diagram, site visit notes.		

Task number:	24.		
Task statement:	Plan for team member		
Level of task:	Significance	Ease	Occurrence
	3	2	3
Terminal performance standard	**Given Condition** • Site visit note and layout drawing; • List of team members **Task:** Plan for team member. **Time:** 30 minutes /plan. **Standard/Criteria:** • Team members are selected based on their expertise in the given list; • All electrical activities are assigned with at least one team member; • All team members are assigned with activities and their roles & responsibilities; • All team members are also communicated with their respective time duration for start and completion of the activities.		
Related technical knowledge	• Team, team members, experts and expertise; • Importance of team and requirement of team members or commencement of the assigned work; • Effective planning and role of team members; • Time duration required to complete the different electrical activities.		
Safety/precaution	• Ensure the right experts are selected in the team members.		
Tools, equipment and materials	• List of available experts and electrical activities; • Agreement; • Site visit note; • Layout drawing.		

Task number:	25.		
Task statement:	Plan for required materials, tools and equipment.		
Level of task:	Significance	Ease	Occurrence
	3	2	2
Terminal performance standard	**Given Condition** • Approved work schedule; • Layout diagram. **Task:** Plan for required materials, tools and equipment. **Time:** 60 minutes /plan **Standard/Criteria:** • List of required tools/ /equipment/ and materials are prepared based on the approved work schedule and layout diagram; • Quantity of required tools/ /equipment and materials are calculated; • Separate list of materials is prepared for procurement; • Prepared list is reviewed for confirmation; • The list is agreed, approved and communicated with respective supervisor and customer.		
Related technical knowledge	• Tools, equipment and materials used in electrical sector and their functions; • Quantity calculation of tools, equipment and materials;		
Safety/precaution	• Ensure the accuracy of quantity calculation of tools, equipment and materials.		
Tools, equipment and materials	• Standard format for quantity calculation; • Calculator; • List of electrical tools, equipment and materials.		

Task number:	26.		
Task statement:	Verify the electrical materials		
Level of task:	Significance	Ease	Occurrence
	3	3	3
Terminal performance standard	**Given Condition** • Actual materials procured; • List of material required; • Specification of materials. **Task:** Verify the electrical materials. **Time:** 30 minutes /verification. **Standard/Criteria:** • The quality and quantity of procured materials are matched with the given list and specification of required materials; • The respective senior person is informed about the deficiency and defective materials if any.		
Related technical knowledge	• Importance of preparing list of required materials and their specifications and quality; • Verification process of procured materials.		
Safety/precaution	• Handle materials carefully; • Count the materials with high precision.		
Tools, equipment and materials	• Paper knife; • Gloves; • Mask.		

Task number:	27.		
Task statement:	**Store electrical materials**		
Level of task:	Significance	Ease	Occurrence
	3	3	3
Terminal performance standard	**Given Condition** • Site or location with verified materials; • Store room or area for material storage; • Manuals. **Task:** Store electrical materials. **Time:** 30 minutes /storage (Depends on quantity of materials and size/area of storage place. **Standard/Criteria:** • Electrical materials are segregated based on their application/use/category; • Segregated materials are stored in dry place; • Instructions given in the manual are followed for storing the materials; • Materials are stored in accessible and visible place.		
Related technical knowledge	• Follow the storing procedure given in the manual; • Storing material as per their nature.		
Safety/precaution	• Handle materials with care.		
Tools, equipment and materials	• Storing materials and selves.		

Task number:	28.		
Task statement:	**Prepare working platform**		
Level of task:	Significance	Ease	Occurrence
	3	3	3
Terminal performance standard	**Given Condition** • Working site; • Types of platform material. **Task:** Prepare working platform. **Time:** 30 minutes /platform. **Standard/Criteria:** • Working platform covered the selected area of the working station; • Working platform is stable and safe; • Working platform is strong enough to bear the materials and the worker; • Area for placing materials is considered during platform construction; • Ladder is placed for easy access to the platform; • Prepared working platform is matched with the area.		
Related technical knowledge	• Meaning of platform, its importance and use; • Platform material and its application; • Procedure for preparing working platform.		
Safety/precaution	• Platform is inspected for safety & security; • Apply PPE.		
Tools, equipment and materials	• Drum; • Bamboo; • Rope: • Ladder.		

Task number:	29.		
Task statement:	**Conduct safety meeting**		
Level of task:	Significance	Ease	Occurrence
	3	3	3
Terminal performance standard	**Given Condition** • Before starting work; • Hazardous working site; • All team members; • Agenda of meeting, time and venue. **Task:** Conduct safety meeting. **Time:** 15 minutes /meeting. **Standard/Criteria:** • Discussed on all agenda related to the site safety; • All team members are provided their roles and responsibilities and safety awareness; • All team member follow and applied the discussed agenda back in their work.		
Related technical knowledge	• Importance and rational of safety meeting; • Agenda of construction site safety meeting; • Posture of all team members during safety meeting.		
Safety/precaution	• Apply PPE during the tool box meeting.		
Tools, equipment and materials	• PPE.		

Task number:	30.		
Task statement:	**Operate multi-meter**		
Level of task:	Significance	Ease	Occurrence
	3	3	3
Terminal performance standard	**Given Condition** • Multi-meter; • Electrical device ready for test; • Standard forms and format. **Task:** Operate multi-meter. **Time:** 15 minutes /operation. **Standard/Criteria:** • Multimeter mode is selected as per required function; • Probes are connected to correct testing terminals; • The readings displayed in the multimeter screen is noted in the respective field (voltage/current/resistance) of the standard format.		
Related technical knowledge	• Importance of multi-meter and its uses; • Standard units of voltage/current/resistance, low & high voltage.		
Safety/precaution	• Apply PPE (face shield, gloves, shoes).		
Tools, equipment and materials	• Multi-meter.		

Task number:	31.		
Task statement:	**Operate Tacho-meter**		
Level of task:	Significance	Ease	Occurrence
	1	1	1
Terminal performance standard	**Given Condition** • Tacho-meter; • Electrical motor. **Task:** Operate Tacho-meter. **Time:** 5 minutes /operation. **Standard/Criteria:** • Tacho-meter mode is selected based on the required function; • Reading of RPM is taken/noted; • Noted/taken RPM is matching with the standard.		
Related technical knowledge	• Meaning and importance of Tacho-meter and its uses; • Standard of RPM & MPM; • Operating procedure of Tacho-meter.		
Safety/precaution	• Apply PPE (face shield, gloves, shoes).		
Tools, equipment and materials	• Tacho-meter.		

Task number:	32.		
Task statement:	**Drill a hole using hand drilling machine**		
Level of task:	Significance	Ease	Occurrence
	3	2	2
Terminal performance standard	**Given Condition** • Hand drilling machine with drill bit (concrete & metal); • Location or marked area ready for drilling. **Task:** Drill a hole using hand drilling machine**.** **Time:** 5 minutes /hole. **Standard/Criteria:** • Hole is drilled at the marked area; • Respective drill (concrete/metal/wood) bit is used; • Drilling area is cleaned after completion of the work.		
Related technical knowledge	• Importance of hand drill machine and its uses; • Standard of drill bit and its types; • Operating procedure of drill machine; • Position of using drill machine.		
Safety/precaution	• Apply PPE (face shield, goggles, gloves, shoes); • Handle drill machine and drill bits safely.		
Tools, equipment and materials	• Drill machine; • Drill bit (as per requirement); • Hole cutter.		

Task number:	33.		
Task statement:	**Cut a material using angle grinder machine**		
Level of task:	Significance	Ease	Occurrence
	3	2	2
Terminal performance standard	**Given Condition** • Angle grinder machine with grinder wheel (concrete/metal/wood); • Material (concrete/metal/wood) material with marked area and ready for cutting. **Task:** Cut a material using angle grinder machine**.** **Time:** 30 minutes (depends on the quantity of materials required to be cut). **Standard/Criteria:** • Material is cut on the marked area; • Respective wheel is selected and fitted in angle grinder machine; • Diamond wheel for concrete, wall, brick, stone; TCT wheel for metal and HSS wheel for wood is used in grinder machine; • Work place is cleaned after completion of work.		
Related technical knowledge	• Importance of grinder machine and its uses; • Standard of grinder wheel and its types; • Operating procedure of grinding machine; • Position of using grinding machine.		
Safety/precaution	• Apply PPE (face shield, goggles, gloves, shoes).		
Tools, equipment and materials	• Angle grinder; • Grinder wheel (as per requirement).		

Task number:	34.		
Task statement:	**Crimp cable lugs using crimping tool**		
Level of task:	Significance	Ease	Occurrence
	3	1	2
Terminal performance standard	**Given Condition** • Laid cable lugs; • Cable lugs/shoe (as per required); • Cable. **Task:** Crimp cable lugs using crimping tool. **Time:** 1 minutes /tip of cable **Standard/Criteria:** • Cable is crimped with lugs/shoe using crimping tool; • Cable lugs are tighten; • Insulation is done as per colour code after crimping cable lugs.		
Related technical knowledge	• Importance of crimping cable lugs and its type; • Standard procedure for operating crimping tool; • Selection of cable lugs.		
Safety/precaution	• Apply PPE (face shield, goggles, gloves, shoes).		
Tools, equipment and materials	• Crimping tool; • Knife; • Cable lugs/shoes; • Wire cutter; • Hacksaw with frame; • Cables; • Insulation tape (red, yellow, black/blue, colours).		

Task number:	35.		
Task statement:	**Measure current value using clamp meter**		
Level of task:	Significance	Ease	Occurrence
	3	2	2
Terminal performance standard	**Given Condition** • Electrical load ready for test. **Task:** Measure current value using clamp meter. **Time:** 5 minutes /measurement. **Standard/Criteria:** • Select the mode/range of clamp meter; • Clamp the jaw of clamp meter on the live wire/cable connected to electrical load; • Reading is taken and noted.		
Related technical knowledge	• Meaning and importance of clamp-on meter; • Procedure of standard operation of clamp-on meter; • Selection of range in clamp-on meter.		
Safety/precaution	• Apply PPE (face shield, goggles, gloves, shoes).		
Tools, equipment and materials	• Clamp-on meter.		

Task number:	36.		
Task statement:	**Measure earthing value using megger**		
Level of task:	Significance	Ease	Occurrence
	3	2	3
Terminal performance standard	**Given Condition** • Earthing completed working site; • Types of earthing; • Ready to test electrical device/component. **Task:** Measure earthing value using megger. **Time:** 20 minutes /measurement. **Standard/Criteria:** • Mode/range of megger/ earth tester is selected; • Probe is connected on test device/component; • Reading is taken and noted.		
Related technical knowledge	• Meaning and Importance of megger/earth tester; • Procedure of standard operation of megger/earth tester; • Selection of range in megger/ earth tester.		
Safety/precaution	• Apply PPE (goggles, gloves, shoes).		
Tools, equipment and materials	• Megger/earth tester; • Connecting probe.		

Task number:	37.		
Task statement:	**Solder with an electric soldering iron**		
Level of task:	Significance	Ease	Occurrence
	3	2	2
Terminal performance standard	**Given Condition** • Soldering components or parts or ready to join electrical device/component; **Task:** Solder with an electric soldering iron**.** **Time:** 10 minutes / unit soldering. **Standard/Criteria:** • Electrical devices/components are soldered as per connection required. • Solder joint is covered with soldering lead; • Connections are free from short circuit.		
Related technical knowledge	• Meaning and importance of soldering iron; • Procedure of soldering.		
Safety/precaution	• Handle soldering iron safely; • Apply PPE (goggles & gloves).		
Tools, equipment and materials	• Soldering iron; • Paste; • Soldering wire.		

Task number:	38.		
Task statement:	**Mark a line on wall/floor for electric wiring**		
Level of task:	Significance	Ease	Occurrence
	3	3	3
Terminal performance standard	**Given Condition** • Layout drawing; • Location. **Task:** Mark a line on wall/floor for electric wiring**.** **Time:** 5 minutes /marking. **Standard/Criteria:** • Measurement is taken at site; • Marking on wall/floor is done as per given drawing; • Mark is visible and clear; • Measurement and level of marking is checked.		
Related technical knowledge	• Explain measurement and marking; • List drawing symbol; • Importance of spirit level, types and its application;		
Safety/precaution	• Apply PPE (glove, goggles, face shield, shoe).		
Tools, equipment and materials	• Measuring tape; • Spirit level; • Marking tool; • Level pipe.		

Task number:	39.		
Task statement:	**Perform wall grooving**		
Level of task:	Significance	Ease	Occurrence
	3	3	3
Terminal performance standard	**Given Condition** • Layout drawing; • Location; • Marked area/place. **Task:** Perform wall grooving. **Time:** 30 minutes (depends on the marked area for grooving) **Standard/Criteria:** • Grooving is done in marked area; • Depth of grooving is matched with conduit and size of distribution box (DB); • Work place is cleaned after completion of work.		
Related technical knowledge	• Explain grooving on conduit, size and quality; • Importance of signs, symbols and size of DB.		
Safety/precaution	• Apply PPE (apron, glove, goggles, face shield, shoe, ear plug & mask).		
Tools, equipment and materials	• Chisel; • Hammer; • Grinder.		

Task number:	40.		
Task statement:	**Lay PVC pipe**		
Level of task:	Significance	Ease	Occurrence
	3	3	3
Terminal performance standard	**Given Condition** • Layout drawing; • Grooved area/place; • Types and size of PVC pipe. **Task:** Lay PVC pipe. **Time:** 30 minutes (depends on the grooved area) **Standard/Criteria:** • Pipes are laid as per given size in the drawing; • Pipes are laid at grooved area; • Pipes are fixed/clamped using hook clamps.		
Related technical knowledge	• Meaning and importance of PVC pipes • Different size of the PVC pipes; • Use of hook clamps.		
Safety/precaution	• Apply PPE (apron, glove, goggles, face shield, shoe, ear plug & mask).		
Tools, equipment and materials	• PVC pipe; • Clamp; • Hammer; • Plier; • Hacksaw/pipe cutter.		

Task number:	41.		
Task statement:	**Mount join/junction box**		
Level of task:	Significance	Ease	Occurrence
	3	3	3
Terminal performance standard	**Given Condition** • Drawing; • Location with grooved area. **Task:** Mount join /junction box. **Time:** 60 minutes /join box. **Standard/Criteria:** • The join/junction boxes are fit on the wall grooved as per layout drawing; • The join/junction boxes are aligned with wall surface; • The vertical and horizontal level of join/junction boxes are checked; • The Join/junction boxes are fixed with screws; • Excess area of groove is patched; • The join/junction box area is cleaned after completion of work.		
Related technical knowledge	• Meaning and importance of join/junction box, its types and uses; • Mounting procedure of Join/junction box; • Patching the grooved wall;		
Safety/precaution	• Apply PPE (apron, glove, goggles, face shield, shoe, ear plug & mask).		
Tools, equipment and materials	• PVC/Metal box; • Cement, Sand; • Trowel; • Reshow; • Sprit level; • Kara.		

Task number:	42.		
Task statement:	**Perform cable pulling/laying**		
Level of task:	Significance	Ease	Occurrence
	3	3	3
Terminal performance standard	**Given Condition** • Site or location with laid out PVC pipe/board; • Wiring diagram. **Task:** Perform cable pulling/laying. **Time:** 60 minutes (depends on the quantity of cable needed to be pulled) **Standard/Criteria:** • Number of cables are matched with wiring diagram; • Cable wires are pulled through the PVC pipes; • Pulled cable/wire are ferruled/dressed with numbering (as per standard); • Continuity test is carried out immediately after pulling.		
Related technical knowledge	• Wiring diagram, colour code, and symbols; • Electrical wire cables, its sizes and types; • Colour code and standards of wire; • size and types of PVC pipe; • Process of pulling of cable/wire; • Standard methods of ferrulling/dressed with numbering;		
Safety/precaution	• Apply PPE (apron, glove, goggles, face shield, shoe, ear plug & mask); • Wrap with tape to prevent from getting moisture.		
Tools, equipment and materials	• Wire puller; • Cable with different size & colour.		

Task number:	43.		
Task statement:	**Install switch gear**		
Level of task:	Significance	Ease	Occurrence
	3	3	3
Terminal performance standard	**Given Condition** • Switch, socket, outlet, key card system, DND/MMR bell, circuit breaker; • Layout drawing; • Circuit breaker. **Task:** Install switch gear (main/change over switch, socket, DND, make my room bell, key card, circuit breaker). **Time:** 60 minutes (depends on the types and number of switches) **Standard/Criteria:** • Wire is connected as per wiring diagram; • Cable is terminated tightly as per ferruling/dressed; • Connection is tested and verified.		
Related technical knowledge	• Meaning and importance of switch gear and its types/uses (main/change over switch, socket, D&D, make my room bell, key card, circuit breaker) • Installation procedure of switch gear.		
Safety/precaution	• Apply PPE (glove, goggles, face shield, shoe & mask).		
Tools, equipment and materials	• Screw driver set; • Plier/nose plier; • Wire stripper; • Wire cutter; • Insulation tape, phase tester, hand crimping tool, multi-meter.		

Task number:	44.		
Task statement:	**Install electrical fixtures and appliances.**		
Level of task:	Significance	Ease	Occurrence
	3	3	3
Terminal performance standard	**Given Condition** • Installation site or location; • Types of electrical appliances *(fan, light, bulb, A/C, holder, geyser, heater, bell);* • Layout drawing. **Task:** Install electrical fixtures and appliances. **Time:** 60 minutes (depends on the types of electrical fixtures). **Standard/Criteria:** • Wires are connected as per wiring diagram; • Wire is terminated firmly as per ferruling/dressed; • Connections in operating switch and electrical appliances are checked and tested.		
Related technical knowledge	• Meaning and importance of electrical appliances and its types/uses (lighting fixtures, bell, buzzer, ceiling fan, adjustable fan, exhaust fan etc.) • Procedure of installation electrical appliances.		
Safety/precaution	• Apply PPE (glove, goggles, face shield, shoe & mask).		
Tools, equipment and materials	• Screw driver set; • Plier/Nose plier; • Wire stripper; • Wire cutter; • Insulation tape; • Phase tester; • Hand crimping tool; • Multi-meter; • Electrical appliances.		

Task number:	**45.**		
Task statement:	**Install sub-energy meter**		
Level of task:	Significance	Ease	Occurrence
	2	3	2
Terminal performance standard	**Given Condition** • Types of energy meter and its capacity; • Location or site of the installation; • Layout drawing. **Task:** Install and connect sub energy meter. **Time:** 15 minutes /installation. **Standard/Criteria:** • Wires are connected in sub energy metre matching the wiring diagram; • Wires are terminated firmly as ferruling/dressed; • The connections are verified and tested.		
Related technical knowledge	• Meaning and importance of sub energy meter and its types and uses; • Procedure of installation sub energy meter.		
Safety/precaution	• Apply PPE (glove, goggles, face shield, shoe & mask).		
Tools, equipment and materials	• Screw driver set; • Plier/nose plier; • Wire stripper; • Wire cutter; • Insulation tape; • Phase tester; • Hand crimping tool; • Multi-meter; • Sub energy meter.		

Task number:	**46.**		
Task statement:	**Install single phase motor and control system.**		
Level of task:	Significance	Ease	Occurrence
	2	3	2
Terminal performance standard	**Given Condition** • Site or location of installation; • Layout drawing. **Task:** Install single phase motor and control system. **Time:** 20 minutes /installation. **Standard/Criteria:** • Single phase motor is connected to control system per wiring diagram; • Wires are terminated firmly as ferruling/dressed; • Wire connections are verified and tested.		
Related technical knowledge	• Meaning and importance of single phase motor, its types and uses; • Procedure of installing single phase motor; • Starter, its types and use;		
Safety/precaution	• Apply PPE (glove, goggles, face shield, shoe & mask).		
Tools, equipment and materials	• Screw driver set, plier/nose plier, wire stripper, wire cutter; • Insulation tape, phase tester, cable shoe; • Hand crimping tool; • Multi-meter; • DOL starter; • Single phase motor; • Lugs.		

Task number:	47.		
Task statement:	**Install three phase motor and control system**		
Level of task:	Significance	Ease	Occurrence
	3	2	2
Terminal performance standard	**Given Condition** • Working site or location; • Layout drawing; • List of starter (as per requirement). **Task:** Install three phase motor and control system. **Time:** 60 minutes /installation. **Standard/Criteria:** • Three phase motor is connected to control system per wiring diagram; • Wires are terminated firmly as ferruling/dressed; • Wire connections are verified and tested.		
Related technical knowledge	• Meaning of three phase motor and its types and uses; • Procedure of installation three phase motor; • Starter and its types and use.		
Safety/precaution	• Apply PPE (glove, goggles, face shield, shoe & mask).		
Tools, equipment and materials	• Screw driver set, plier/nose plier, wire stripper, wire cutter; • Insulation tape, phase tester, cable shoe, hand crimping tool; • Multi-meter, lugs, DOL starter, star delta starter, forward/reverse starter; • Variable frequency drive (VFD), soft starter; three phase motor.		

Task number:	48.		
Task statement:	**Perform plate earthing**		
Level of task:	Significance	Ease	Occurrence
	3	3	3
Terminal performance standard	**Given Condition** • Site or location of earthing; • Layout diagram of earthing; • Specified place for earthing. **Task:** Perform plate earthing. **Time:** 5 hours /earthing. **Standard/Criteria:** • Pit is excavated as per given size and shape in the layout diagram; • Different layers of earthing materials are prepared matching layout diagram; • Plate, pipe, strip are assembled as per diagram; • Pit is covered with PCC; • GI pipe and earthing strip are exposed over PCC; • Funnel is placed on the GI pipe.		
Related technical knowledge	• Interpretation of earthing layout diagrams; • Earthing types and importance; • Earthing materials, types and use; • Earthing standards, its units and testing; • Plate earthing procedure.		
Safety/precaution	• Apply PPE (glove, goggles, face shield, shoe & mask).		
Tools, equipment and materials	• Spade, pick, shovel, karai; • Earthing wire/strip, charcoal, salt; • Earthing plate, copper nut bolt; • GI pipe, funnel, drill machine; • Spanner set, hammer, wire cutter; • Cable lugs, hand crimping tool; • Sand, brick, cement.		

Task number:	49.		
Task statement:	**Perform pipe earthing**		
Level of task:	Significance	Ease	Occurrence
	3	3	3
Terminal performance standard	**Given Condition** • Layout diagram of earthing; • Specified place for earthing. **Task:** Perform pipe earthing. **Time:** 5 hours /pipe earthing. **Standard/Criteria:** • Pit is excavated as per given size and shape in the layout diagram; • Different layers of earthing materials are prepared matching layout diagram; • Plate, pipe, strip are assembled as per diagram; • Pit is covered with PCC; • Earthing strip is ensured to expose over PCC; • Funnel is placed on the GI pipe.		
Related technical knowledge	• Interpretation of earthing layout diagrams; • Earthing types and importance; • Pipe earthing materials, types and its uses; • Pipe earthing standard, its units and testing; • Pipe earthing procedure.		
Safety/precaution	• Apply PPE (glove, goggles, face shield, shoe & mask).		
Tools, equipment and materials	• Spade, pick, shovel, karai, earthing pipe, charcoal, salt; • Earthing plate, copper nut bolt, GI pipe, funnel, drill machine, spanner set; • Hammer, wire cutter, cable lugs, hand crimping tool, sand, brick, cement.		

Task number:	50.		
Task statement:	**Perform rod earthing**		
Level of task:	Significance	Ease	Occurrence
Terminal performance standard	**Given Condition** • Layout diagram of rod earthing; • Specified place for rod earthing. **Task:** Perform rod earthing. **Time:** 5 hours /rod earthing. **Standard/Criteria:** • Pit is excavated as per given size and shape in the layout diagram; • Different earthing materials are laid respectively around the pipe matching layout diagram; • Earthing rod, strip are assembled as per diagram; • Hole area and the pit are covered with PCC; • Rod is ensured to expose over PCC.		
Related technical knowledge	• Interpretation of earthing layout diagrams; • Earthing types and importance; • Rod earthing materials and types/use; • Standards of Rod earthing, its unit and testing; • Rod earthing procedure.		
Safety/precaution	• Apply PPE (glove, goggles, face shield, shoe & mask).		
Tools, equipment and materials	• Spade, pick, shovel, karai, earthing rod, charcoal; • Salt, earthing plate, copper nut bolt, rod; • Funnel, drill machine, spanner set; • Hammer, wire cutter, cable lugs; • Hand crimping tool, sand, brick, cement.		

Task number:	51.		
Task statement:	**Perform chemical earthing**		
Level of task:	Significance	Ease	Occurrence
	2	1	1
Terminal performance standard	**Given Condition** • Layout diagram of earthing; • Specify place for earthing. **Task:** Perform chemical earthing. **Time:** 5 hours/chemical earthing. **Standard/Criteria:** • Cylindrical boring pit of size 10 cm diametre and 3m depth is prepared at site as per layout diagram; • Earthing electrode is inserted and earth is back filled; • Chemical compound is filled with water; • Water is gradually added and mixed the chemical compound till the mixture is uniform; • Copper wire is connected to earthing electrode and MCB box; • The earthing/working area is cleaned after completion of work.		
Related technical knowledge	• Interpretation of earthing layout diagrams; • Earthing materials, types, and uses; • Importance of earthing; • Earthing standard, its units and testing; • Chemical earthing procedure.		
Safety/precaution	• Apply PPE (glove, goggles, face shield, shoe & mask).		
Tools, equipment and materials	• Earthing materials; • Earth electrode, spanner set, boring machine, earthing chemical, mixing pot.		

Task number:	52.		
Task statement:	**Install generator**		
Level of task:	Significance	Ease	Occurrence
	3	1	2
Terminal performance standard	**Given Condition** • Wiring diagram; • Generator; • Manual change over switch/ATS (auto transfer switch); • Platform/location. **Task:** Install generator. **Time:** 5 hours /installation. **Standard/Criteria:** • Generator is connected with building installation line as per wiring diagram; • Manual change over switch and ATS (auto transfer switch) is installed in generator to operate automatically power off and on; • Generator is immediately started or shut down automatically right after municipal power supply cut and power on; • Generator is free from vibration; • Body earth and system earth is connected tightly at the distance of minimum 3 meter.		
Related technical knowledge	• Introduction of generator and its importance/function, objectives and types; • Fixing and Wiring procedure of the generator; • Familiarise with instructional and operational manual of generator.		
Safety/precaution	• Prevent hands from heat shrink; • Apply PPE (gloves, goggles).		
Tools, equipment and materials	• Cable, cable lugs, gland (PVC/GI), cable paste, ampere tape; • PVC tape, wrench, hydraulic crimping tools, source, multi-meter.		

Task number:	53.		
Task statement:	**Install inverter/UPS**		
Level of task:	Significance	Ease	Occurrence
	3	1	1
Terminal performance standard	**Given Condition** • Wiring diagram of UPS/Inverter; • Battery (based on UPS/inverter system); • Platform/location; **Task:** Install inverter/UPS. **Time:** 2 hours /installation. **Standard/Criteria:** • UPS/Inverter line is connected to building installation line as per wiring diagram; • Manual change over switch and ATS (auto transfer switch) is installed in UPS/Inverter; • UPS/Inverter is in auto mode; • Connection with battery is tight using given lubricant; • Circuit breaker is connected based on load consumption; • UPS/inverter are placed in well ventilated and free from moisture.		
Related technical knowledge	• Meaning and importance of UPS/Inverter/battery and its importance/function, • Objectives and types of UPS/Inverter/battery; • Series and parallel connection with battery; • Connection diagram and connection procedure with battery; • Importance of circuit breaker.		
Safety/precaution	• Use rubber hand gloves and PPE.		
Tools, equipment and materials	• Cable, cable lugs, PVC tape, wrench, hand crimping tools, source, battery; • Circuit breaker, UPS/Inverter, plier, spanner, multi-meter and paste.		

Task number:	54.		
Task statement:	**Install solar back-up system**		
Level of task:	Significance	Ease	Occurrence
	2	2	2
Terminal performance standard	**Given Condition** • Site or location of installation; • Wiring diagram, solar panel with frame; • Capacity of solar back-up system. **Task:** Install solar- back up system. **Time:** 2 hours /installation. **Standard/Criteria:** • Solar panel is connected as per wiring diagram; • Separate DC wiring is carried out; • Connection with battery is tight using given lubricant; • Circuit breaker is connected based on load consumption; • Solar panel is placed facing to SE direction at the angle ranging from 30-40^0; • Solar panel body is connected with earthing.		
Related technical knowledge	• Meaning of solar panel, battery and its importance and function; • Objectives and types of solar back-up system; • Series and parallel connection with battery; • Interpret connection diagram and connection procedure with battery; • Circuit breaker and DC wiring.		
Safety/precaution	• Use rubber hand gloves and PPE (Helmet).		
Tools, equipment and materials	• Cable, cable lugs, PVC tape, wrench, crimping tools, source, battery, circuit breaker, solar panel with frame/stand; 12 V battery, solar controller, circuit breaker, platform/location, paste; • Plier, spanner, multi-meter, clamp on meter, drilling machine.		

Task number:	55.		
Task statement:	**Install battery bank (battery charging system)**		
Level of task:	Significance	Ease	Occurrence
	3	1	1
Terminal performance standard	**Given Condition** • Installation site or location; • Capacity of the battery bank and its types; • Wiring diagram. **Task:** Install battery bank (battery charging system). **Time:** 2 hours /installation. **Standard/Criteria:** • Battery is connected as per wiring/connection diagram; • Separate DC wiring is carried out; • Connection with battery is tight using given lubricant; • Circuit breaker is connected based on load consumption; • Battery charger is connected to junction box; • Battery bank is place at dry and well ventilated place; • Battery bank is connected with earthing.		
Related technical knowledge	• Introduction of battery bank and its importance/function; • Battery charger and its importance/function; • Selection of battery charger based on load consumption; • Series and parallel connection with battery; • Interpret connection diagram; • Connection procedure with battery; • Circuit breaker and DC wiring.		
Safety/precaution	• Apply PPE (Helmet); • Use rubber gloves.		
Tools, equipment and materials	• Cable, cable lugs, PVC tape, wrench, crimping tools, source; • Battery, circuit breaker, battery, battery stand, battery charger; • Plier, spanner, multi-meter, clamp on meter, drilling machine and paste.		

Task number:	56.		
Task statement:	**Install electrical security system (thumb reader, door lock, fire alarm system)**		
Level of task:	Significance	Ease	Occurrence
	3	1	2
Terminal performance standard	**Given Condition** • Wiring diagram, electrical security material; • Location, control room for system and DC power supply. **Task:** Install electrical security system (thumb reader, door lock, fire alarm system). **Time:** 60 minutes /installation. **Standard/Criteria:** • Electrical wiring is connected to security system as per wiring diagram; • Electrical security system devices (thumb reader, door lock, and fire alarm system) are functional when tested.		
Related technical knowledge	• Reasons of sequencing of cable connection (cross, parallel); • Introduction of electrical and electronics security system and devices; • Classification of electrical/electronic security system, devices; • Process of installation the electrical/electronic security system.		
Safety/precaution	• Should not connect/touch with electrical circuit; • Apply PPE.		
Tools, equipment and materials	• Fire alarm devices, thumb reader, electrical door luck, DVR/NVR CCTV; • CAT-6, co-axial cable, crimping tool, RJ-45 and RJ-11, ferrule, multi-meter; • Fire alarm control panel (FACP), manual call point (MCP), • Isolator module (ISO), control relay, monitor, DC power supply.		

Task number:	57.		
Task statement:	**Install networking system (DVR/NVR CCTV, PABX)**		
Level of task:	Significance	Ease	Occurrence
	3	1	2
Terminal performance standard	**Given Condition** • Location or site of installation; • Wiring diagram; • Location, control room for system; • DC power supply. **Task:** Install networking system (DVR/NVR CCTV, PABX). **Time:** 2 hours /installation. **Standard/Criteria:** • Network connection is done as per given topology; • Cable termination in devices are strongly fixed; • The network signal is transmitted to all devices without any loss.		
Related technical knowledge	• Meaning of network topology its types and importance; • Network devices and their applications; • Overview of PABX, LAN, WAN, MAN.		
Safety/precaution	• Should not connect/touch with electrical circuit; • Apply PPE.		
Tools, equipment and materials	• Thumb reader, CAT-6, PABX, modem, networking switch; • Router, co-axial cable, crimping tool, RJ-45 and RJ-11, ferrule, multi-meter; • LAN tester, monitor, DC power supply.		

Task number:	58.		
Task statement:	**Install sub-station equipment.**		
Level of task:	Significance	Ease	Occurrence
	3	1	3
Terminal performance standard	**Given Condition** • Location and site for installation; • Wiring diagram, transformer; • Earthing set and equipment for sub-station. **Task:** Install and control sub-station equipment. **Time:** 4 hours /installation. **Standard/Criteria:** • Wiring is done as per diagram; • Cable termination is tighten; • High voltage from municipal supply and supplied voltages are controlled by sub-station equipment when tested; • Incoming and outgoing voltage reading is measured using ToD metre.		
Related technical knowledge	• Meaning of transformer, types & use; • Introduction of Insulator, types & use; • An overview of lightening arrestor; • ToD Meter and its functioning. • Types of pole transformer, voltage metering unit and APFC lighting arrestor.		
Safety/precaution	• Full body harness; • Transformer is bounded with fence wall and warning board; • Apply PPE (HT Gloves).		
Tools, equipment and materials	• Insulator, pole, HV (High Voltage) metering unit; • LV (Low voltage) metering unit, transformer, circuit breakers (GOS); • VCB panel, crimping tool (Hydraulic), cable lugs, spanner; • Hammer, multi-meter, heat sink, lighting arrester, earthing; • Automatic power factor connection (APFC) panel, chain pulley; • Rope, ladder, C-channel, nut bolts and megger.		

Task number:	59.		
Task statement:	Monitor electrical works		
Level of task:	Significance	Ease	Occurrence
	3	2	2
Terminal performance standard	**Given Condition** • Complete installation package of electrical fixers and appliances; • Layout diagram, check list (monitor) and location (working site). **Task:** Monitor electrical works. **Time:** 2 hours /monitoring. **Standard/Criteria:** • Electrical circuits are free from short circuits; • Additional Insulation in wires are done as required or detected naked wire; • The monitoring of electrical works is done based on given check list.		
Related technical knowledge	• Meaning of electrical works'; • Importance of monitoring electrical installation; • Monitoring criteria and check list.		
Safety/precaution	• Apply PPE.		
Tools, equipment and materials	• Check list, layout diagram and measuring tape.		

Task number:	60.		
Task statement:	Perform continuity test		
Level of task:	Significance	Ease	Occurrence
	3	3	3
Terminal performance standard	**Given Condition** • Complete installation package of electrical fixers and appliances; • Layout diagram, continuity tester and conductor ready for continuity test. **Task:** Perform continuity test. **Time:** 30 minutes /test. **Standard/Criteria:** • The supply of electricity in the wire is checked. • The continuity of electricity in the wire is confirmed with the use of multi-metre and/or continuity tester.		
Related technical knowledge	• Meaning and importance of continuity test; • Operation of multi-meter; • Explain conductor & insulator.		
Safety/precaution	• Apply PPE.		
Tools, equipment and materials	• Continuity tester, multi-meter and conductor.		

Task number:	61.		
Task statement:	Perform insulation resistance testing		
Level of task:	Significance	Ease	Occurrence
	3	3	2
Terminal performance standard	**Given Condition** • Layout diagram, megger and conductor ready for insulation test; • List of reference value. **Task:** Perform insulation testing. **Time:** 30 minutes /test. **Standard/Criteria:** • The resistance of the conductor is confirmed within the range of given respective reference value; • Tested conductor is marked after conduction of insulation test.		
Related technical knowledge	• Introduction of megger and its uses; • Insulation in conductor and importance of insulation resistance test; • An overview of reference value for insulation resistance test.		

Safety/precaution	• Apply PPE and handle megger carefully.
Tools, equipment and materials	• Megger, extension probe, conductor and list of reference value.

Task number:	**62.**		
Task statement:	**Test cable terminals (for leakage and tightness)**		
Level of task:	Significance	Ease	Occurrence
	3	3	3
Terminal performance standard	**Given Condition** • Installed circuit system of electrical fixtures and appliances; • Working sites or location; • Connecting terminals. **Task:** Test cable terminals (for leakage and tightness). **Time:** 30 minutes /test. **Standard/Criteria:** • All connection at terminals are tightened; • Gap between insulation and terminals are maintained.		
Related technical knowledge	• Meaning of testing cable terminals and its importance.		
Safety/precaution	• Apply PPE; • Handle tools carefully; • Make sure the power supply is cut off before testing terminals.		
• Tools, equipment and materials	• Plier; • Screw driver set; • Cutter (wire).		

Task number:	**63.**		
Task statement:	**Perform earthing test**		
Level of task:	Significance	Ease	Occurrence
	3	3	1
Terminal performance standard	**Given Condition** • Working sits or location; • Earth pit; • List of reference value. **Task:** Perform earthing test. **Time:** 30 minutes /test. **Standard/Criteria:** • All circuit connection at terminals are tightened; • Gap between earth pit and terminals is maintained; • Reading value in earth ground resistance meter is matched with reference value.		
Related technical knowledge	• Importance of earthing test; • Importance and range of reference value; • Earth testing devices and their types.		
Safety/precaution	• Apply PPE; • Handle tools carefully.		
Tools, equipment and materials	• Earthing tester; • Connecting probes.		

Task number:	64.		
Task statement:	**Test transformer and equipment**		
Level of task:	Significance	Ease	Occurrence
	3	3	1
Terminal performance standard	**Given Condition** • Working sits or location; • Equipment testing standard; • Transformer and equipment; • List of reference value. **Task:** Test transformer and equipment. **Time:** 60 minutes /test. **Standard/Criteria:** • All connection at terminals are tighten; • Gap between test probes and other terminals are maintained; • Reading value is matched with reference value; • Insulator, lightening arrestor, fuse, transformers are tested and matched as per standard; • Connecting terminals are sealed.		
Related technical knowledge	• Meaning of transformer equipment testing; • Load and no load and its importance; • Reference value of transformer; • Equipment testing standard.		
Safety/precaution	• Apply PPE; • Handle equipment carefully.		
Tools, equipment and materials	• Megger; • Clamp on meter; • Extension cord; • Spanner, plier, and screw driver.		

Task number:	65.		
Task statement:	**Perform RPM test**		
Level of task:	Significance	Ease	Occurrence
	2	2	2
Terminal performance standard	**Given Condition** • Working site or location; • Electric motor-drive with company tag; • Electric motor (ready for RPM test). **Task:** Perform RPM test. **Time:** 10 minutes /test. **Standard/Criteria:** • RPM of motor is noted and cross checked with company tag. • Defective electric motor is recommended for repair and maintenance.		
Related technical knowledge	• Meaning and importance of RPM and importance of testing; • Describe load torque of electrical motor and its calculation.		
Safety/precaution	• Apply PPE; • Handle equipment carefully.		
Tools, equipment and materials	• Tacho-meter with accessories.		

Task number:	66.		
Task statement:	**Perform schedule maintenance**		
Level of task:	Significance	Ease	Occurrence
	2	2	2
Terminal performance standard	**Given Condition** • Work site or location; • Layout diagram/wiring; • Maintenance schedule. **Task:** Perform schedule maintenance. **Time:** 1 hour /routine work. **Standard/Criteria:** • Maintenance is done as per given schedule; • Condition of electrical equipment is noted and recorded; • Remarks given are addressed and materialised during the scheduled maintenance.		
Related technical knowledge	• Meaning and importance of preventive maintenance and its classification: • An overview of schedule maintenance; • Record keeping and its importance.		
Safety/precaution	• Apply PPE; • Shut down the system before maintaining device.		
Tools, equipment and materials	• Measuring and testing equipment; • Hand tools, Standards; • List of reference value; • Cleaning equipment, Ladder.		

Task number:	67.		
Task statement:	**Perform breakdown maintenance**		
Level of task:	Significance	Ease	Occurrence
	3	1	3
Terminal performance standard	**Given Condition** • Work station/site; • Installed and used electrical fixtures and appliances; • Electrical devices and equipment needed to be repaired. **Task:** Perform breakdown maintenance. **Time:** N/A **Standard/Criteria:** • Fault finding of the electrical device is carried out; • The faulty device is repaired; • The repaired device is tested for its function.		
Related technical knowledge	• Function of electrical accessories and devices; • An overview of electrical components (contractor, relay, MPCB, transistor, capacitor, NO (normally open)-NC (normally close), register, PLC); • Dismantling and assembling process of the accessories and devices.		
Safety/precaution	• Apply PPE; • Isolate circuit before dismantle of accessories/devices.		
Tools, equipment and materials	• Electrical accessories; • Hand tools, measuring and testing equipment.		

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