

NSDA Code 2020/POW/DGT/03735

CONTACT DETAILS OF THE BODY SUBMITTING THE QUALIFICATION FILE

Directorate General of Training (DGT)
Government of India, Ministry of Skill Development and Entrepreneurship,
1st and 2nd Floor, CIRTES Building
Next to Pusa ITI, Pusa Campus
New Delhi – 110012.

Name and address of submitting body:

Directorate General of Training (DGT)
Government of India, Ministry of Skill Development and Entrepreneurship,
1st and 2nd Floor, CIRTES Building
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Name and contact details of individual dealing with the submission

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List of documents submitted in support of the Qualifications File

1. Competency-based curriculum with following details:

Model Curriculum to be added which will include the following:

- a) Indicative list of tools/equipment to conduct the training: Enclosed with curriculum
- b) Trainers qualification: Indicated in the curriculum
- c) Lesson Plan: All DGT curricula are designed indicating specific practical to be carried out during training along with details of trade theory. Based on this the

concerned instructor prepares the Lesson Plan and demonstration plan with support of IMPs developed by NIMI,DGT.

- d) Distribution of training duration into theory/practical/OJT component: Indicated in the curriculum.
2. Curriculum for Core Skills (Workshop Calculation & Science, Engineering Drawing and Employability Skills).

NSQC Approved

• **SUMMARY**

1	Qualification Title	'WIREMAN'
2	Qualification Code, if any	DGT/1009
3	NCO code and occupation	7411.0301 – Wireman, Light and Power
4	Nature and purpose of the qualification (Please specify whether qualification is short term or long term)	Prepare skilled Technician to undertake the job roles of Wireman and will enable the trainee to plan, install and repair electrical wiring such as cleat, conduit, casing, concealed etc in factories, workshops, business and residential premises etc. It is long term qualification.
5	Body/bodies which will award the qualification	Directorate General of Training (DGT).
6	Body which will accredit providers to offer courses leading to the qualification	Directorate General of Training (DGT) accredits the Training providers (ITIs/ NSTIs/ MSTIs/ BTCs/ BTPs / Industries / Establishments).
7	Whether accreditation/affiliation norms are already in place or not , if applicable (if yes, attach a copy)	Yes. The accreditation/ affiliation norms and any amendments made from time to time are available on DGT web portal.
8	Occupation(s) to which the qualification gives access	<ul style="list-style-type: none"> • 7411.0301 – Wireman, Light and Power
9	Job description of the occupation	Wireman will be able to plan, install and repair electrical wiring, erect switch boards and fix switch box casings cleats, conduits, meters etc. in factories, workshops, business and residential premises etc. and the technician generally fixes fuses, covers as per diagram and eliminates chances of short circuit and earthing.
10	Licensing requirements	NOT REQUIRED
11	Statutory and Regulatory requirement of the relevant sector (documentary evidence to be provided)	NOT APPLICABLE
12	Level of the qualification in the NSQF	Level 4

13	Anticipated volume of training/learning required to complete the qualification	Sl. No.	Course Element	
			Notional Training Hours	
		1	Professional Skill (Trade Practical)	2000
		2	Professional Knowledge (Trade Theory)	640
		3	Workshop Calculation & Science	160
		4	Engineering Drawing	160
		5	Employability Skills	240
	Total	3200		
14	Indicative list of training tools required to deliver this qualification	As per Annexure-I of curriculum.		
15	Entry requirements and/or recommendations and minimum age	Passed 8th Class. Minimum age 14 years as on first day of academic session.		
16	Progression from the qualification (Please show Professional and academic progression)	An Individual can proceed for:		
		Professional	Technical / Academic	
		<ul style="list-style-type: none"> • Technician • Senior Technician • Supervisor • Manager • Entrepreneur 		
17	Arrangements for the Recognition of Prior learning (RPL)	<ul style="list-style-type: none"> • Yes (For more details refer "Guidelines for Private candidate" in DGT website MIS portal). 		
18	International comparability where known (research evidence to be provided)	-----		
19	Date of planned review of the	5 Yrs from the Date of Approval		

	qualification.			
20	Formal structure of the qualification			
	Mandatory components			
	Title of component and identification code/NOSs/ Learning Outcomes	Estimated size (learning hours)		Level
		Skills	Knowledge	
TRADE SPECIFIC				
(i)	Make good quality electrical wire joints for single and multi strand conductors suitable for applications with soldering following safety precautions.	125	35	3
(ii)	Draw and set up DC and AC circuits including R-L-C circuits with accurate measurement of voltage, current, resistance, power, power factor and energy using ammeter, voltmeter, ohm-meter, watt-meter, energy meter, power factor meter and phase sequence tester with proper care and safety.	150	42	4
(iii)	Plan, draw, estimate material, wire up and test different type of domestic wiring circuits as per Indian Electricity rules and taking care of quality. Construction and working of MCB & ELCB. Test a domestic wiring installation using Megger.	175	49	5
(iv)	Identify the type of batteries, construction, working and application of Ni-cadmium, lithium cell, lead acid cell etc. Demonstrate their charging and discharging, choosing appropriate method and carryout the installation and routine maintenance with due care and safety.	75	21	4
(v)	Make choices to carry out basic jobs of marking out the components for filing, drilling, and riveting, fitting and assembled	100	28	4

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	using different components independently.			
(vi)	Plan and install Pipe & Plate earthing. Measure earth resistance by earth tester.	25	7	4
(vii)	Select and perform electrical/ electronic measurements with appropriate instrument.	75	21	4
(viii)	Plan and execute electrical illumination system viz. FL tube, HPMV lamp, HPSV lamp, Halogen & metal halide lamp, CFL, LED lamp etc.	25	7	4
(ix)	Plan, draw, estimate material, wire up and test different type of industrial wiring circuits as per Indian Electricity rules and taking care of quality.	125	35	5
(x)	Plan, draw, estimate material, wire up and test different type of commercial and computer networking wiring circuits as per Indian Electricity rules and taking care of quality.	125	35	5
(xi)	Construct and test Half-wave, full-wave, and bridge rectifiers with filter & without filter. Troubleshoot and service of DC regulated power supply.	100	36	4
(xii)	Interpret the constructional features, working principles of DC machine. Starting with suitable starter, running, forward and reverse operation and speed control of DC motors. Conduct the load performance test of DC machine with due care and safety. Maintain and troubleshoot of DC machines.	150	54	4
(xiii)	Interpret the constructional features, working principles of single phase and 3 phase AC motors. Starting with suitable starter, running, forward and reverse operation and speed control of AC motors with due care and safety.	225	81	4
(xiv)	Interpret the constructional features, working principles of Alternator set. Test, Wire-up and run alternator. Synchronization of Alternator with due care and safety.	75	27	4

(xv)	Interpret the types, constructional features, working principles of transformer (single & three phase) Connect and test Transformer.	75	27	4
(xvi)	Prepare single line diagram and layout plan of electrical transmission & distribution systems and power plants with knowledge of principle applied. Make and test power connection to substation equipments with care and safety.	225	81	4
(xvii)	Select, assemble, test and wire-up control panel.	75	27	5
(xviii)	Plan, estimate and costing of different types of wiring system as per Indian Electricity rule.	75	27	5
CORE SKILL				
EMPLOYABILITY SKILLS				
(i)	Apply safe working practices.	-	30	4
(ii)	Comply with environment regulation and housekeeping.	-	30	4
(iii)	Interpret & use formal and technical communication.	-	30	4
(iv)	Apply the concept in productivity & quality management in day to day work to improve productivity & quality.	-	30	4
(v)	List and interpret various acts of labour welfare legislation.	-	30	4
(vi)	Explain energy conservation, global warming and pollution and contribute in day to day work by optimally using available resources.	-	30	4
(vii)	Explain personnel finance, entrepreneurship and manage/organize related task in day to day work for personal & societal growth.	-	30	4
(viii)	Utilize basic computer applications and internet to take benefit of IT developments in the industry.	-	30	4
WORKSHOP CALCULATION & SC				

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(i)	Demonstrate basic mathematical concept and principles to perform practical operations.	-	80	4
(ii)	Explain basic science in the field of study including simple machine.	-	80	4
ENGINEERING DRAWING				
(i)	Read and apply engineering drawing for different application in the field of work.	-	160	4
	Total		3200	-

SECTION 1
ASSESSMENT

21	<p>Body/Bodies which will carry out assessment: Controller of Examinations, DGT</p>
22	<p>How will RPL assessment be managed and who will carry it out? DGT will carry out the RPL assessment following the below mentioned eligibility criteria for Trainee: Applicants aspiring to appear as Private Candidates in the AITT under CTS for award of NTC, have been categorized based on their educational background and experience. Subsequently 'Private Candidates' may be admitted under one of the following categories. Category wise 'eligibility criteria' for appearing as 'Private Candidate' in AITT under CTS has been listed below: Category I: Ex-trainees (successful pass-outs) of ITI A. Ex-trainees of ITI who already possess NTC in one of the trades under CTS, are eligible for applying as Private candidate for an allied trade, provided he/ she fulfils all the conditions regarding educational qualification etc. prescribed for that allied trade. B. In addition, the applicant should possess minimum of 1 year experience (as on date of submission of application) post the date of AITT result declaration in the desired allied trade in establishments implementing Apprenticeship Training Scheme (ATS)/ establishments registered under the Apprenticeship portal or registered MSMEs or Entities registered with any government/local authorities / shops covered under Factories Act 1948 and Shops and Establishments Act applicable for the concerned State. Category II: 'Ex-trainees (successful pass-outs) and current trainees under CoE scheme A. The applicant should have the minimum prescribed entry qualification and should fulfil eligibility criteria for the desired trade under CTS, in which he/she intends to appear for AITT as Private Candidate. CoE candidates must register as 'Private Candidate' under CTS in the relevant/mapped CTS trade only. B. There should be a minimum gap of 1 year between successful completions of CoE training i.e. from the date of result declaration to the date of submission of application for 'Private Candidate' certification. C. During this gap of 1 year, the candidate must have undergone Industry training or gained experience in desired trade in establishments implementing Apprenticeship Training Scheme (ATS)/ establishments registered under the Apprenticeship portal or registered MSMEs or Entities registered with any government/local authorities / shops covered under</p>

	<p>Factories Act 1948 and Shops and Establishments Act applicable for the concerned State.</p> <p>Category III: SCVT Candidates (admitted till August 2018 session) A. No special provisions have been made for SCVT Trainees to enrol as 'Private Candidate'. Going forward, SCVT trainees have been granted equivalence vide G.S.R 186(E) dated 2nd March 2017 for undergoing apprenticeship training under the Apprentices Act 1961 to obtain 'NAC'. B. Only for SCVT trainees admitted till August 2018 batch, provision has been made for obtaining NTC by appearing in AITT under 'Private Candidate'. Such trainees will continue to be governed by old guidelines for 'Private Candidate'.</p> <p>Category IV: Other Candidates (candidate not falling in any of the above 3 categories, including SCVT trainees enrolled from admission session 2019 onwards) A. The applicant should have the minimum prescribed entry qualification and should fulfil eligibility criteria for the relevant trade under CTS, in which he/she desires to appear for AITT as Private Candidate. B. Applicant should be minimum 21 years of age on the date of submission of application. There is no upper age limit. C. The applicant should possess minimum of 3 years' experience (on the date of submission of application) in the relevant trade in establishments implementing Apprenticeship Training Scheme (ATS)/ establishments registered under the Apprenticeship portal or registered MSMEs or Entities registered with any government/local authorities / shops covered under Factories Act 1948 and Shops and Establishments Act applicable for the concerned State. (For detail and updated information please refer to DGT web portal.)</p>
<p>23</p>	<p>Describe the overall assessment strategy and specific arrangements which have been put in place to ensure that assessment is always valid, reliable and fair and show that these are in line with the requirements of the NSQF.</p> <p>(1) Assessment process: The assessment for the qualification is carried out by conducting formative assessments, and end of year examinations (Summative). The formative assessments in respect of each Learning Outcome for practical and related theory are conducted by the concerned instructors for evaluating the knowledge and skill acquired by trainees and the behavioural transformation of the trainees. This formative assessment is primarily</p>

carried out by collecting evidence of competence gained by the trainees by evaluating them at work based on assessment criteria, asking questions and initiating formative discussions to assess understanding and by evaluating records and reports. Summative assessment is carried out by All India Trade Test on Trade Theory, Trade practical, Workshop Calculation & Science, Engineering Drawing and Employability Skills. The question papers for the theory Examinations contain objective type questions.

The marking pattern and distribution of marks for the qualification are as under:

Marking Pattern				
Sl. No.	Type of assessment	Subject for the trade test	Marks for the 1st Year	Marks for the 2nd Year
1	Summative Assessment	Practical	250	250
2		Trade Theory	100	100
3		Employability Skills	50	50
4		Workshop Calculation and Science.	50	50
5		Engineering Drawing	50	50
6	Formative assessment based on Learning Outcomes		200	200
TOTAL:			700	700

(2) Minimum pass marks:

The minimum pass percent for Trade Practical and Formative assessment is 60% & for all other subjects is 33%. There will be no Grace marks.

Testing and certifications for the course:

Controller of examinations, DGT carries out the assessment and issues National Trade Certificate (NTC) following the norms and guidelines issued

by the Directorate from time to time.

Overall assessment strategy:

Assessment of the qualification evaluates trainees to show that they can integrate knowledge, skills and values for carrying out relevant tasks as per the defined learning outcomes and assessment criteria. The trainees may choose the preferred language for assessment. The underlying principle of assessment is fairness and transparency. While assessing the trainee, assessor is directed to assess as per the defined assessment criteria against the learning outcomes. The evidence of the competence acquired by the trainees can be obtained by conducting theory and practical examinations, observing the trainees at work, asking questions and initiating discussions to assess, understand and evaluate records and reports. The ultimate objective of the assessment is to assess the candidates as per the defined assessment criteria for the learning outcomes.

Specific Arrangements for assessment:

- Assessment is outcome-based.
- There are formative and summative assessments in Theory and Practical.
- Assessment is carried out in Trade theory, Trade Practical, Workshop Calculation and Science, Engineering Drawing and Employability Skills.
- While Trade Theory and Trade Practical are used for assessing Trade-related jobs, Workshop Calculation and Science is used to test trainee's numerical and logical skills, Drawing is used to test the ability of the trainee to draw and read sketches and Employability skills is used to test the communication, professional language, leadership, entrepreneurship and team-work abilities of the trainee.
- In addition to demonstration of theory and practical knowledge, trainees get a chance to present total personality.

Quality assurance activities:

Question papers are set by external paper setters/ software generated. Evaluation of Theory Examinations in Trade, Workshop Calculation & Science, Engineering Drawing and Employability Skill is done by third-party agency. Trade Practical is examined by External Examiner.

24. Assessment evidences

Title of Component: Formative Assessment Breakup
 (on half yearly average of the learning assessment covered)

Means of assessment

Assessment will be evidence based comprising the following for each Learning Outcome:

Serial No.	Terminal Competency	Maximum Weightage (%)
1	Safety consciousness	15
2	Workplace hygiene	5
3	Attendance/ Punctuality	10
4	Ability to follow Manuals/ Written instructions	5
5	Application of Knowledge	10
6	Skills to handle tools / equipment/ Instruments/ Devices	10
7	Economical use of materials	5
8	Working Strategy	10
9	Quality in workmanship/ Performance	15
10	VIVA	15
	Total Maximum Weightage (%)	100

Pass/Fail

The minimum pass percentage is 60% marks for formative assessment.

LEARNING OUTCOME WITH ASSESSMENT CRITERIA:

LEARNING OUTCOMES	ASSESSMENT CRITERIA
FIRST YEAR	
1. Make good quality electrical wire joints for single and multi strand conductors suitable for applications with soldering following electrical safety precautions.	Observe safety/ precaution during joints & soldering.
	Make simple straight twist and rat-tail joints in single strand conductors.
	Make married and 'T' (Tee) joint in stranded conductors.
	Prepare a Britannia straight and 'T' (Tee) joint in bare conductors.
	Prepare western union joint in bare conductor.
	Solder the finished copper conductor joints with precaution.
	Prepare termination of cable lugs by using crimping tool.

2. Draw and set up DC and AC circuits including R-L-C circuits with accurate measurement of voltage, current, resistance, power, power factor and energy using ammeter, voltmeter, ohm-meter, watt-meter, energy meter, power factor meter and phase sequence tester with proper care and safety.	Identify types of wires, cables and verify their specifications.
	Verify the characteristics of series, parallel and its combination circuit.
	Analyze the effect of the short and open in series and parallel circuits.
	Verify the relation of voltage components of R.L.C. series circuit in AC.
	Determine the power factor by direct and indirect methods in an AC single phase R, L, C parallel circuit.
	Identify the phase sequence of a 3 ϕ supply using a phase-sequence meter.
	Prepare / connect a lamp load in star and delta and determine relationship between line and phase values with precaution.
	Connect balanced and unbalanced loads in 3 phase star system and measure the power of 3 phase loads with safety/precaution.
3. Plan, draw, estimate material, wire up, test different type of domestic wiring circuits as per Indian Electricity rules and taking care of quality. Construction and working of MCB & ELCB. Test a domestic wiring installation using Megger.	Comply with safety & IE rules when performing the domestic wiring.
	Identify the parts of MCB & ELCB and test its operation.
	Identify the types of fuses their ratings and applications.
	Prepare and mount the energy meter board with due care.
	Draw and wire up the consumers main board with ICDP switch and distribution fuse box.
	Draw and wire-up to control lamp controlled from 2 places (stair case wiring) on batten wiring as per IE rule.
	Draw and wire-up single phase domestic pump set in PVC conduit wiring as per IE rule.
	Draw and wire-up in casing capping one lamp controlled from 3 different places using intermediate switch as per IE rule.
	Wire –up in PVC conduit wiring for calling bell/buzzer & test them.
	Estimate the material for wiring in PVC casing & capping for two lamps, one fan and one 6A socket outlet & wire-up.
Test a domestic wiring installation by using Megger.	
4. Identify the type of batteries, construction, working and application of Ni-cadmium, lithium cell, lead acid cell etc.	Assemble a DC source 6V/500 mA using 1.5V cells.
	Determine the Formative resistance of cell and make grouping of cells.
	Identify the parts of a battery charger and test for its operation.
	Demonstrate charging of battery and test for its condition with

Demonstrate their charging and discharging, choosing appropriate method and carryout the installation and routine maintenance with due care and safety.	safety/ precaution.
	Installation and maintenance of batteries.
	Maintain, service and troubleshoot a battery charger.
5. Make choices to carry out basic jobs of marking out the components for filing, drilling, and riveting, fitting and assembled using different components independently.	Identify the trade hand tools; Demonstrate their uses with safety, care & maintenance.
	Prepare a simple half lap joint using firmer chisel with safety.
	Prepare tray using sheet metal with the safety
	Demonstrate fixing surface mounting type of accessories.
	Perform connection of electrical accessories.
	Make and wire up of a test board and test it.
6. Plan and install Pipe & Plate earthing. Measure earth resistance by earth tester.	Measure soil conductivity
	Install the pipe earthing and test it.
	Install the plate earthing and test it.
	Measure the earth electrode resistance using earth tester.
	Carry out earth resistance improvement.
7. Select and perform electrical/ electronic measurements with appropriate instrument.	Identify the type of electrical instruments.
	Determine the measurement errors while measuring resistance by voltage drop method.
	Extend the range of MC voltmeter and ammeter.
	Measure the power and energy in a single & three phase circuit using wattmeter and energy meter with CT and PT.
	Test single phase energy meter for its errors.
	Measure the value of resistance, voltage and current using digital multimeter.
	Measure the power factor in poly-phase circuit and verify the same with voltmeter, ammeter, wattmeter readings.
	Calibrate analog instruments.
	Measure frequency by frequency meter.
	Use meggar for insulation testing
8. Plan and execute	Install light fitting with reflectors for direct and indirect lighting.

electrical illumination system viz. FL tube, HPMV lamp, HPSV lamp, Halogen & metal halide lamp, CFL, LED lamp etc.	Assemble and connect a & single twin tube F.L.
	Connect, install and test the H.P.M.V, H.P.S.V, Halogen & metal halide lamp with accessories.
	Prepare and test a decorative serial lamp set for 190 V using 6V bulb and flasher.
	Connect the neon sign with the accessories and test it.
	Assemble and install solar photo voltaic light.
	Install light fitting for show case window lighting.
	Install & test CFL & LED lamps.
	Measure intensity of light using LUX Meter.
9. Plan, draw, estimate material, wire up, test different type of industrial wiring circuits as per Indian Electricity rules and taking care of quality.	Comply with safety & IE rules when performing the Industrial wiring.
	Wire-up PVC Conduit wiring for lighting circuit & 3 phase motor circuit with due care and safety.
	Estimate the material required for the given layout for metal conduit wiring for 3 phase 3 HP squirrel cage induction motor & wire-up as per IE rule.
	Make termination to the feeder cable in bus bar & to service cable through plug-in box with due care and safety.
	Erect a bus bar chamber on an angle iron board and wire-up for 3 phase induction motor with due care and safety.
	Determine the size of cable for main & distribution board of a workshop.
	Test an industrial wiring installation by using Megger.
10. Plan, draw, estimate material, wire up and test different type of commercial and computer networking wiring circuits as per Indian Electricity rules and taking care of quality.	Estimate the material for PVC channel wiring for telephone intercom having 5 instruments from main distribution frame (MDF) with due care.
	Estimate the material and wire-up PVC concealed conduit wiring of three phase installation of 3 stores office building having 4 lamps, 2 fans, one 5 A socket outlet and one buzzer in each room with ELCB protection as per IE rule.
	Draw and wire up a bank/hostel/hospital/commercial establishment in PVC conduit as per IE rule.
	Test a commercial wiring installation by using Megger.
	Wire up and test LAN wiring with due care.
	Install co axial cable from dish antenna to Television set.
	Prepare and connect batteries with UPS with due care and safety.
	Install and test UPS in the circuit with due care and safety.

SECOND YEAR	
11. Construct and test Half-wave, full-wave, and bridge rectifiers with filter & without filter. Trouble shoot and service of DC regulated power supply.	Demonstrate soldering of components.
	Identify passive /active components by visual appearance, Code number and test for their condition.
	Construct and test a half wave, full wave and bridge rectifiers with and without filter circuits.
	Identify the control and functional switches in CRO and measure the D.C. / A.C. voltage, frequency and time period.
	Identify the parts, trouble shoot & service a DC regulated power supply.
12. Interpret the constructional features, working principles of DC machine. Starting with suitable starter, running, forward and reverse operation and speed control of DC motors. Conduct the load performance test of DC machine with due care and safety. Maintain and troubleshoot of DC machines.	Plan work in compliance with standard safety norms related with DC machines.
	Identify the parts of DC machine and measure armature & field resistances and insulation resistance.
	Connect a DC generator, build up the voltage & load with proper safety.
	Disassemble, service and assemble a DC generator with due care.
	Connect the DC motor through 2/3/4 point starter, run, adjust the speed & change direction of rotation.
	Troubleshoot & maintain a DC machine.
13. Interpret the constructional features, working principles of single phase and 3 phase AC motors. Starting with suitable starter, running, forward and reverse operation and speed control of AC motors with due care and safety.	Plan work in compliance with standard safety norms related with AC motors.
	Connect start, run and reverse the DOR of different type of single phase motors.
	Identify the terminals of 3 phase squirrel cage induction motor, wire up, run using different types of starters and change the direction of rotation.
	Determine the efficiency of 3 phase squirrel cage induction motor by no load test/ blocked rotor test and brake test.
	Wire up, start, run and adjust the speed of a slip-ring induction motor.
	Construct DOL, Forward/Reverse starter circuits using push button switches, contactors, overload relays etc.
	Demonstrate power connections to motors.

14. Interpret the constructional features, working principles of Alternator set. Test, Wire-up and run alternator. Synchronization of Alternator with due care and safety.	Plan work in compliance with standard safety norms related with Alternator.
	Identify the parts of an Alternator, measure armature & field resistances and insulation resistance.
	Wire-up, start and run an alternator and build up the voltage.
	Load the Alternator & find out regulation at different loads.
	Synchronise the Alternators with mains.
15. Interpret the types, constructional features, working principles of transformer (single & three phase) Connect and test Transformer.	Plan work in compliance with standard safety norms related with transformer.
	Identify the types of transformers and their specifications.
	Measure winding resistance & Insulation resistance of single phase & 3 phase transformer.
	Identify the terminals; verify the transformation ratio of a single phase and 3 phase transformer.
	Connect and test a single phase auto- transformer.
	Determine the losses (iron loss and copper loss) efficiency and regulation of a single phase transformer at different loads.
	Connect transformers in parallel.
16. Prepare single line diagram and layout plan of electrical transmission & distribution systems and power plants with knowledge of principle applied. Make and test power connection to substation equipments with care and safety.	Plan work in compliance with standard safety norms related with substation & over head lines.
	Prepare layout plan, single line diagram of different type of power plant and project report of all equipments and machineries of the visited plant.
	Prepare single line diagram of the institute's electrical substation & distribution system.
	Demonstrate testing and use of line protecting devices as per IE rules.
	Make power connection to substation equipments.
	Identify the parts of substation equipments like circuit breakers and operate them.
	Perform crimping of lugs to underground cable and connect the cable to bus bars & equipments with due care.
	Start the generator, build up voltage and synchronise with mains by observing due care and safety.
17. Select, assemble, test	Draw the layout diagram of 3 phase AC motor control cabinet.

and wire-up control panel wiring.	Mount the control elements and wiring accessories on the control panel.
	Demonstrate wiring the control cabinet for local and remote control of induction motor.
	Draw and wire up the control panel for forward/ reverse operation of induction motor.
	Test the control panel for all the required logics.
18. Plan, estimate and costing of different types of wiring system as per Indian Electricity rule.	Prepare layout and wiring diagram of domestic, commercial and industrial installation using IER symbols.
	Record the various electrical wiring accessories available in market with price list and compare it.
	Plan, Estimate and Costing of Domestic wiring as per layout.
	Plan, Estimate and Costing of commercial wiring as per layout.
	Plan, Estimate and Costing of Industrial wiring as per layout.

LEARNING OUTCOME (CORE SKILL)	
LEARNING OUTCOME	ASSESSMENT CRITERIA
EMPLOYABILITY SKILLS	
1. Apply safe working practices	Follow and maintain procedures to achieve a safe working environment in line with occupational health and safety regulations and requirements and according to site policy.
	Recognize and report all unsafe situations according to site policy.
	Identify and take necessary precautions on fire and safety hazards and report according to site policy and procedures.
	Identify, handle and store / dispose off dangerous goods and substances according to site policy and procedures following safety regulations and requirements.
	Identify and observe site policies and procedures in regard to illness or accident.
	Identify safety alarms accurately.
	Report supervisor/ Competent of authority in the event of accident or sickness of any staff and record accident details correctly according to site accident/injury procedures.
	Identify and observe site evacuation procedures according to site policy.
	Identify Personal Protective Equipment (PPE) and use the

	same as per related working environment.
	Identify basic first aid and use them under different circumstances.
	Identify different fire extinguisher and use the same as per requirement.
2. Comply with environment regulation and housekeeping	Identify environmental pollution & contribute to the avoidance of instances of environmental pollution.
	Deploy environmental protection legislation & regulations
	Take opportunities to use energy and materials in an environmentally friendly manner.
	Avoid waste and dispose waste as per procedure
	Recognize different components of 5S and apply the same in the working environment.
3. Interpret & use formal and technical communication.	Obtain sources of information and recognize information.
	Use and draw up technical drawings and documents.
	Use documents and technical regulations and occupationally related provisions.
	Conduct appropriate and target oriented discussions with higher authority and within the team.
	Present facts and circumstances, possible solutions & use English special terminology.
	Resolve disputes within the team.
	Conduct written communication.
4. Apply the concept in productivity & quality management in day to day work to improve productivity & quality.	Explain the concept of productivity and apply during execution of job.
	Explain the concept of quality tools and apply during execution of job.
5. List and interpret various acts of labour welfare legislation.	Explain basic concept of labour welfare legislation, adhere to responsibilities and remain sensitive towards such laws.
	Knows benefits guaranteed under various acts.
6. Explain energy conservation, global warming and pollution and contribute in day to day work by optimally using	Explain the concept of energy conservation, global warming, pollution and utilize the available resources optimally & remain sensitive to avoid environment pollution.
	Explain standard procedure for disposal of waste.

available resources.	
7. Explain personnel finance, entrepreneurship and manage/organize related task in day to day work for personal & societal growth.	<p>Explain personnel finance and entrepreneurship.</p> <p>Explain role of various schemes and institutes for self-employment i.e. DIC, SIDA, SISI, NSIC, SIDO, Idea for financing/ non-financing support agencies to familiarize with the policies/ programmes, procedure & the available scheme.</p> <p>Prepare a report to become an entrepreneur for submission to financial institutions.</p>
8. Utilize basic computer applications and internet to take benefit of IT developments in the industry.	<p>Explain the basic hardware of personal computer.</p> <p>Use common application software viz., word, excel, power point etc., in day to day work.</p> <p>Awareness about useful internet websites, search relevant information pertaining to the assigned tasks.</p>
WORKSHOP CALCULATION & SCIENCE	
1. Demonstrate basic mathematical concept and principles to perform practical operations.	<p>Solve different problems like phase angle, etc. with the help of a calculator.</p> <p>Demonstrate conversion of Fraction to Decimal and vice versa.</p> <p>Explain BCD code, conversion from decimal to binary and vice-versa, all other conversions.</p>
2. Explain basic science in the field of study including simple machine.	<p>Explain concept of basic science related to the field such as Material science, Mass, weight, density, speed, velocity, heat & temperature, force, motion, pressure, heat treatment, centre of gravity, friction.</p> <p>Explain levers and its types.</p> <p>Explain relationship between Efficiency, velocity ratio and Mechanical Advantage.</p> <p>Prepare list of appropriate materials by interpreting detail drawings and determine quantities of such materials.</p> <p>Solve simple problems on lifting tackles like crane-Solution of problems with the aid of vectors.</p>
ENGINEERING DRAWING	
1. Read and apply engineering drawing for different application in the field of work.	<p>Read & interpret the information on drawings and apply in executing practical work.</p> <p>Read & analyse the specification to ascertain the material requirement, tools and assembly/maintenance parameters.</p> <p>Encounter drawings with missing/unspecified key information and make own calculations to fill in missing</p>

	dimension/parameters to carry out the work.
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NSQC Approved

SECTION 2

25. EVIDENCE OF LEVEL

OPTION A

Title/Name of qualification/component: WIREMAN			Level:
4			
NSQF Domain	Outcomes of the Qualification/Component	How the outcomes relates to the NSQF level descriptors	NSQF Level
Process	<p>Work in familiar, predictable, routine, situation of clear choice</p> <ul style="list-style-type: none"> • Make good quality electrical wire joints for single and multi strand conductors suitable for applications with soldering following safety precautions. • Plan, draw, estimate material, wire up and test different type of domestic wiring circuits as per Indian Electricity rules and taking care of quality. Construction and working of MCB & ELCB. Test a domestic wiring installation using Megger. • Make choices to carry out basic jobs of marking out the components for filing, drilling, and riveting, fitting and assembled using different components independently. 	<p>The learner requires to work in familiar and predictable work for example 'Plan, draw, estimate material, wire up and test different type of domestic wiring circuits as per Indian Electricity rules and taking care of quality. Construction and working of MCB & ELCB. Test a domestic wiring installation using Megger'. One needs to perform routine set of activities in a situation of clear choice.</p> <p>The learner requires to 'Make choices to carry out basic jobs of marking out the components for filing, drilling, and riveting, fitting and assembled using different components independently' and 'Plan and install Pipe & Plate earthing'. In all these learning outcomes the learner has to apply one's knowledge to meet the client's requirement</p>	4

Title/Name of qualification/component: WIREMAN 4			Level:
NSQF Domain	Outcomes of the Qualification/Component	How the outcomes relates to the NSQF level descriptors	NSQF Level
	<ul style="list-style-type: none"> Plan and install Pipe & Plate earthing. Measure earth resistance by earth tester. 	<p>in familiar, predictable and routine situation with clear choice of procedures.</p> <p>Hence NSQF Level is 4 for this descriptor.</p>	
Professional knowledge	<p>Factual knowledge of field of knowledge or study</p> <ul style="list-style-type: none"> Introduction and explanation of electrical wiring systems, cleat wiring, casing & Capping, CTS, Conduit and concealed etc. Branching of circuits with respect to loads such as lighting and power. Conduit pipe wiring materials and accessories, types and sizes of conduit. Construction, working & applications of – Incandescent lamp, Fluorescent tube, CFL, Neon sign, Halogen, Mercury vapour and types, sodium vapour etc. Wiring in commercial building- their special precautions as per I.E. rules. General idea of fixing meter boards & taking service connection. 	<p>The learner requires demonstrating factual knowledge of work or study. He applies the processes and general concepts, in the field of work or study related to Wireman Trade like Electrical wiring, branching of circuits, conduit pipe wiring materials etc.</p> <p>Hence NSQF Level is 4 for this descriptor.</p>	4

Title/Name of qualification/component: WIREMAN 4			Level:
NSQF Domain	Outcomes of the Qualification/Component	How the outcomes relates to the NSQF level descriptors	NSQF Level
Professional skill	<ul style="list-style-type: none"> Plan, draw, estimate material, wire up and test different type of industrial wiring circuits as per Indian Electricity rules and taking care of quality. Construct and test Half-wave, full-wave, and bridge rectifiers with filter & without filter. Troubleshoot and service of DC regulated power supply. Select and perform electrical/ electronic measurements with appropriate instrument. 	<p>As per the learning outcomes indicated in the adjacent cell the learner recalls and demonstrates practical skill such as 'Plan, draw, estimate material, wire up and test different type of industrial wiring circuits as per Indian Electricity rules and taking care of quality' and 'Select and perform electrical/ electronic measurements with appropriate instrument' applying basic methods, tools, materials and information.</p> <p>Hence NSQF Level is 4 for this descriptor.</p>	4
Core skill	<p>Basic Mathematical and Algebraic principles</p> <ul style="list-style-type: none"> Demonstrate basic mathematical concept and principles to perform practical operations. Understand and explain basic science in the field of study including simple machine. Read and apply engineering drawing for different application in the field of work. 	<p>The learning outcomes for example 'Demonstrate basic mathematical concept and principles to perform practical operations' and 'Understand and explain basic science in the field of study including simple machine ' display the learning outcomes where the learner needs to display basic mathematical and algebraic principles; understanding of social, political; and some skill of collecting and organising information, communication.</p>	4

Title/Name of qualification/component: WIREMAN 4			Level:
NSQF Domain	Outcomes of the Qualification/Component	How the outcomes relates to the NSQF level descriptors	NSQF Level
	<p>Basic understanding of social political and natural environment</p> <ul style="list-style-type: none"> • Explain energy conservation, global warming and pollution and contribute in day to day work by optimally using available resources. • Explain personnel finance, entrepreneurship and manage/organize related task in day to day work for personal & societal growth. <p>Language to communicate written or oral, with required clarity</p> <ul style="list-style-type: none"> • Interpret & use formal and technical communication. • List and interpret various acts of labour welfare legislation. 	Hence NSQF Level is 4 for this descriptor.	
Responsibility	<ul style="list-style-type: none"> • Interpret the types, constructional features, working principles of transformer (single & three phase) Connect and test Transformer. • Prepare single line diagram and layout 	The role of Wireman is independently responsible to perform the work as per specifications and their own analysis of what needs to be done based on their understanding of electrical processes, principles and standards.	4

Title/Name of qualification/component: WIREMAN 4			Level:
NSQF Domain	Outcomes of the Qualification/Component	How the outcomes relates to the NSQF level descriptors	NSQF Level
	<p>plan of electrical transmission & distribution systems and power plants with knowledge of principle applied. Make and test power connection to substation equipments with care and safety.</p> <ul style="list-style-type: none"> • Select, assemble, test and wire-up control panel. • Plan, estimate and costing of different types of wiring system as per Indian Electricity rule. 	<p>Learning outcomes like “Select, assemble, test and wire-up control panel”, “Plan, estimate and costing of different types of wiring system as per Indian Electricity rule” etc. reveal the same.</p> <p>Hence NSQF Level is 4 for this descriptor.</p>	

SECTION 3
EVIDENCE OF NEED

26	<p>What evidence is there that the qualification is needed? What is the estimated uptake of this qualification and what is the basis of this estimate?</p> <table border="1" data-bbox="339 551 1390 1697"> <thead> <tr> <th data-bbox="339 551 627 692">Basis</th> <th data-bbox="627 551 1390 692">In case of other Awarding Bodies (Institutes under Central Ministries and states departments)</th> </tr> </thead> <tbody> <tr> <td data-bbox="339 692 627 1072">Need of the qualification</td> <td data-bbox="627 692 1390 1072">Power Sector has a significant presence of organized as well as unorganized skilled manpower requirement. This sector is poised to grow exponentially in the years to come and is highly labour intensive and there are many emerging trends in this sector. Hence the qualification has been designed keeping in view to cater to the ever-increasing demand of skilled manpower in consultation with stakeholders.</td> </tr> <tr> <td data-bbox="339 1072 627 1498">Industry Relevance</td> <td data-bbox="627 1072 1390 1498">The job role defined for the qualification is as per the National Classification of Occupations 2015 which is developed by Employment Directorate under the ministry of Labour and Employment in collaboration with different industry partners and as per ILO guidelines. Moreover, the training is imparted in ITIs/NSTIs/MSTIs/BTC/ BTPs/ Industries / Establishments etc. where such requirement is available. This justifies the qualification is very much relevant for industry.</td> </tr> <tr> <td data-bbox="339 1498 627 1626">Usage of the qualification</td> <td data-bbox="627 1498 1390 1626">The Proposed qualification will create skilled Technician for various establishments in different Sectors.</td> </tr> <tr> <td data-bbox="339 1626 627 1697">Estimated uptake</td> <td data-bbox="627 1626 1390 1697">The present seating capacity is 62118.</td> </tr> </tbody> </table>	Basis	In case of other Awarding Bodies (Institutes under Central Ministries and states departments)	Need of the qualification	Power Sector has a significant presence of organized as well as unorganized skilled manpower requirement. This sector is poised to grow exponentially in the years to come and is highly labour intensive and there are many emerging trends in this sector. Hence the qualification has been designed keeping in view to cater to the ever-increasing demand of skilled manpower in consultation with stakeholders.	Industry Relevance	The job role defined for the qualification is as per the National Classification of Occupations 2015 which is developed by Employment Directorate under the ministry of Labour and Employment in collaboration with different industry partners and as per ILO guidelines. Moreover, the training is imparted in ITIs/NSTIs/MSTIs/BTC/ BTPs/ Industries / Establishments etc. where such requirement is available. This justifies the qualification is very much relevant for industry.	Usage of the qualification	The Proposed qualification will create skilled Technician for various establishments in different Sectors.	Estimated uptake	The present seating capacity is 62118.
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Estimated uptake	The present seating capacity is 62118.										
27	<p>Recommendation from the concerned Line Ministry of the Government/Regulatory Body. To be supported by documentary evidences.</p> <p>The qualification originally designed for Craftsman Training Scheme is in existence for many years and approved by DGT (Regulatory Body) under Ministry of Skill Development and Entrepreneurship, Govt. of India.</p>										

28	<p>What steps were taken to ensure that the qualification(s) does (do) not duplicate already existing or planned qualifications in the NSQF? Give justification for presenting a duplicate qualification</p> <p>The qualification is originally designed and approved by DGT for the Craftsman Training Scheme and is in existence for many years. No such duplicate qualification of same duration and competencies exists.</p>
29	<p>What arrangements are in place to monitor and review the qualification(s)? What data will be used and at what point will the qualification(s) be revised or updated? Specify the review process here</p> <ul style="list-style-type: none"> • The research wing of CSTARI & DGT reviews and updates the qualification, in consultation with industries and other stakeholders, on a regular basis by conducting trade committee meetings. • DGT will monitor any duplicity by comparing existing qualifications with upcoming ones in the National Qualifications Register (NQR) and relevant sectors.

SECTION 4
EVIDENCE OF PROGRESSION

30 **What steps have been taken in the design of this or other qualifications to ensure that there is a clear path to other qualifications in this sector? Show the career map here to reflect the clear progression**

On completion of the training the trainee will have an opportunity to move in vertical/horizontal pathways to promote to higher designations. The learner can further undergo other specialised courses to excel in the relevant field.

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    graph LR
      Technician[Technician] --> Senior[Senior Technician]
      Senior --> Supervisor[Supervisor]
      Supervisor --> Manager[Manager]
      Senior --> Entrepreneur[Entrepreneur]
  
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The diagram illustrates a career progression path. It starts with a box labeled 'Technician'. An arrow points to a box labeled 'Senior Technician'. From 'Senior Technician', an arrow points to a box labeled 'Supervisor', which in turn points to a box labeled 'Manager'. A separate arrow points downwards from the 'Senior Technician' box to a box labeled 'Entrepreneur'.