*Please refer* ***Guidelines for STT/LTT/Apprenticeship/OEM Qualification File***

**QUALIFICATION FILE**

# ELECTRICIAN

**☐ Short Term Training (STT) ☒ Long Term Training (LTT) ☐ Apprenticeship**

**☐ Upskilling ☐ Dual/Flexi Qualification ☐ For ToT ☐ For ToA**

**☒ General ☐ Multi-skill (MS) ☐ Cross Sectoral (CS) ☐ Future Skills ☐ OEM**

**NCrF/NSQF Level: 5**

**Submitted By:**

**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.**

## Table of Contents

## Section 1: Basic Details

<table>
<tr><td>1.</td><td>Qualification Name</td><td colspan="2">ELECTRICIAN</td></tr>
<tr><td>2.</td><td>Sector/s</td><td colspan="2">POWER</td></tr>
<tr><td>3.</td><td>Type of Qualification: ☐ New ☒ Revised ☐ Has Electives/Options<br>☐ OEM</td><td>NQR Code & version of existing/previous qualification: 2018/POW/DGT/02230</td><td>Qualification Name of existing/previous version: ELECTRICIAN (CITS)</td></tr>
<tr><td>4.</td><td>a. OEM Name<br>b. Qualification Name<br>(Wherever applicable)</td><td colspan="2">NA</td></tr>
<tr><td>5.</td><td>National Qualification Register (NQR) Code & Version<br>(Will be issued after NSQC approval)</td><td>QG-4.5-IT-03174-2024-V2-DGT</td><td>6. NCrF/NSQF Level: 4.5</td></tr>
<tr><td>7.</td><td>Award (Certificate/Diploma/Advance Diploma/Any Other(Wherever applicable specify multiple entry/exits also & provide details in annexure)</td><td colspan="2">National Craft Instructor Certificate (NCIC)</td></tr>
<tr><td>8.</td><td>Brief Description of the Qualification</td><td colspan="2">The individual will be able to impart theoretical instructions, demonstrate practical skills, evaluate and grade trainees of Electrician and related trades in ITIs/ Vocational Training Institutes, industrial workshops, etc</td></tr>
<tr><td>9.</td><td>Eligibility Criteria for Entry for Student/Trainee/Learner/Employee</td><td colspan="2">a. Entry Qualification &Relevant Experience:
<table>
<tr><th>S. No.</th><th>Academic/Skill Qualification (with Specialization - if applicable)</th><th>Required Experience (with Specialization - if applicable)</th></tr>
<tr><td>1.</td><td>Degree in Electrical/ Electrical and Electronics Engineering from AICTE/ UGC recognized Engineering College / University.<br>OR<br>03 years Diploma in Electrical/ Electrical and Electronics Engineering after class 10th from AICTE/ recognized board of technical education.<br>OR<br>Ex-serviceman from Indian Armed forces with 15 years of service in related field as per equivalency</td><td></td></tr>
</table></td></tr>
</table>

| | | |
|---|---|---|
| | | through DGR.<br>OR<br>10th Class with 02 years NTC/NAC passed in the trade of "Electrician". |

**b. Age:** Minimum age 16 years as on first day of academic session.

| | | | |
|---|---|---|---|
| **10.** | **Credits Assigned to this Qualification, Subject to Assessment** *(as per National Credit Framework (NCrF))* | 45 | **11. Common Cost Norm Category (I/II/III)** *(wherever applicable)*: **N/A** |
| **12.** | **Any Licensing requirements for Undertaking Training on This Qualification** *(wherever applicable)* | NA | |
| **13.** | **Training Duration by Modes of Training Delivery** *(Specify **Total Duration** as per selected training delivery modes and as per requirement of the qualification)* | **☒ Offline ☐Online ☐Blended** | |
| **14.** | **Aligned to NCO/ISCO Code/s***(if no code is available mention the same)* | 2356.0100, 7411.0100, 7412.0200, 7411.0301, 3122.6000, 3123.0400 | |
| **15.** | **Progression path after attaining the qualification** *(Please show Professional and Academic progression)* | **Professional**<br>• Technical Instructor in a vocational training Institute/ technical Institution<br>• Supervisor in Industries | **Academic**<br>• Diploma<br>• Advance Diploma (Vocational)<br>• Degree<br>• PG |
| **16.** | **Other Indian languages in which the Qualification & Model Curriculum are being submitted** | **Hindi** | |
| **17.** | **Is similar Qualification(s) available on NQR-if yes, justification for this qualification** | **☐ Yes ☒ No URLs of similar Qualifications:** | |
| **18.** | **Is the Job Role Amenable to Persons with Disability** | **☒ Yes ☐ No**<br>**If "Yes", specify applicable type of Disability:** LD, LC, DW, AA, DEAF, HH | |
| **19.** | **How Participation of Women will be Encouraged** | The courses will empower women by creating self-employment opportunities and enabling them to get jobs as this course offers specialized skilling. | |
| **20.** | **Are Greening/ Environment Sustainability Aspects Covered** *(Specify the NOS/Module which covers it)* | **☐ Yes ☒ No** | |

| Training Delivery Modes | Theory (Hours) | Practical (Hours) | OJT Mandatory (Hours) | Total (Hours) |
|---|---|---|---|---|
| **Classroom (offline)** | 450 | 750 | 150 | 1350 |
| **Online** | | | | |

*(Refer Blended Learning Annexure for details)*

| | | | |
|---|---|---|---|
| **21.** | **Is Qualification Suitable to be Offered in Schools/Colleges** | **Schools ☐ Yes ☒ No Colleges ☐ Yes ☒ No** | |
| **22.** | **Name and Contact Details of Submitting / Awarding Body SPOC**<br>*(In case of CS or MS, provide details of both Lead AB & Supporting ABs)* | **Name: Shri Ishwar Singh, Deputy Director General**<br>**Email: ishwar.singh25@gov.in**<br>**Contact No.: 011-25802140**<br>**Website: https://dgt.gov.in/** | |
| **23.** | **Final Approval Date by NSQC: 22th Oct, 2024** | **24. Validity Duration: 3 Yrs. from the Date of Approval** | **25. Next Review Date: 21 Oct. 2027** |

## Section 2: Module Summary

### NOS/s of Qualifications
*(In exceptional cases these could be described as components)*

### Mandatory NOS/s:

Specify the training duration and assessment criteria at NOS/ Module level. For further details refer curriculum document.

***Th**.-Theory **Pr.**-Practical **OJT**-On the Job **Man.**-Mandatory Training **Rec.**-Recommended **Proj.**-Project*

| S. No | NOS/Module Name | NOS/Module Code & Version *(if applicable)* | Core/ Non-Core | NCrF/NSQF Level | Credits as per NCrF | Training Duration (Hours) | | | | | Assessment Marks | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Th. | Pr. | OJT-Man. | OJT-Rec. | Total | Th. | Pr. | Proj. / Int. AM. Th. | Viva / Int. AM. Pr. | Total | Weightage (%) *(if applicable)* |
| **TRADE TECHNOLOGY** | | | | | | | | | | | | | | | | |
| 1. | Ensure implementation of safe working practices, environment regulation and housekeeping | PSS/9415 | Core | 4.5 | 1 | 10 | 20 | | | 30 | 2 | 6 | 1 | 2 | 11 | NA |
| 2. | Explain verification & measurement of different characteristics of electrical circuits. | PSS/9416 | Core | 4.5 | 1 | 10 | 20 | | | 30 | 2 | 6 | 1 | 2 | 11 | NA |
| 3. | Demonstrate installations, testing and maintenance of batteries & solar cells | PSS/9417 | Core | 4.5 | 1 | 10 | 20 | | | 30 | 4 | 11 | 1 | 3 | 19 | NA |
| 4. | Train to estimate, assemble, install and test various wiring systems, winding and Insulating materials. | PSS/9418 | Core | 4.5 | 1 | 10 | 20 | | | 30 | 4 | 11 | 1 | 3 | 19 | NA |
| 5. | Explain verification & | PSS/9416 | Core | 4.5 | 3.5 | 25 | 80 | | | 105 | 11 | 29 | 4 | 9 | 53 | NA |

| S. No | NOS/Module Name | NOS/Module Code & Version *(if applicable)* | Core/ Non-Core | NCrF/NSQF Level | Credits as per NCrF | Training Duration (Hours) | | | | | Assessment Marks | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Th. | Pr. | OJT-Man. | OJT-Rec. | Total | Th. | Pr. | Proj. / Int. AM. Th. | Viva / Int. AM. Pr. | Total | Weightage (%) *(if applicable)* |
| | measurement of different characteristics of Magnetic effect of electric current, parts of DC Generator, DC motor and Power factors. | | | | | | | | | | | | | | | |
| 6. | Evaluate testing, performance and maintenance of transformer | PSS/9419 | Core | 4.5 | 1 | 10 | 20 | | | 30 | 4 | 11 | 2 | 3 | 20 | NA |
| 7. | Monitor testing, check connections, verify errors, calibrate various instruments and electrical Illumination systems | PSS/9420 | Core | 4.5 | 2.5 | 25 | 50 | | | 75 | 9 | 20 | 3 | 6 | 38 | NA |
| 8. | Assess construction of simple electronic circuits and test for functioning | PSS/9421 | Core | 4.5 | 1 | 10 | 20 | | | 30 | 4 | 11 | 1 | 3 | 19 | NA |
| 9. | Demonstrate planning, execution, commissioning and performance of various AC motors & Alternator/ MG set | PSS/9422 | Core | 4.5 | 3.5 | 25 | 80 | | | 105 | 11 | 29 | 4 | 9 | 53 | NA |
| 10. | Analyse detection of faults and troubleshooting of inverter, stabilizer, UPS etc | PSS/9423 | Core | 4.5 | 0.5 | 5 | 10 | | | 15 | 2 | 6 | 1 | 2 | 11 | NA |

| S. No | NOS/Module Name | NOS/Module Code & Version *(if applicable)* | Core/ Non-Core | NCrF/NSQF Level | Credits as per NCrF | Training Duration (Hours) | | | | | Assessment Marks | | | | | Weightage (%) *(if applicable)* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Th. | Pr. | OJT-Man. | OJT-Rec. | Total | Th. | Pr. | Proj. / Int. AM. Th. | Viva / Int. AM. Pr. | Total | |
| 11. | Demonstrate estimation, testing, servicing & troubleshooting components of various domestic/industrial programmable systems & their control circuits | PSS/N9414 | Core | 4.5 | 3 | 30 | 60 | | | 90 | 11 | 27 | 4 | 8 | 50 | NA |
| 12. | Evaluate planning, execution, commissioning & evaluate performance of various conventional/non-conventional power generation, transmission & distribution components | PSS/9424 | Core | 4.5 | 3 | 30 | 60 | | | 90 | 10 | 25 | 4 | 8 | 47 | NA |
| 13. | Demonstrate installation and troubleshooting of Electric Vehicle charging stations | PSS/9425 | Core | 4.5 | 1 | 10 | 20 | | | 30 | 2 | 8 | 1 | 2 | 13 | NA |
| 14. | Read and apply engineering drawing for different application in the field of work | PSS/N9411 | Non-Core | 4.5 | 1 | 30 | - | | | 30 | 12 | | 6 | | 18 | NA |
| 15. | Demonstrate basic mathematical concept | PSS/N9412 | Non-Core | 4.5 | 1 | 30 | - | | | 30 | 12 | | 6 | | 18 | NA |

| S. No | NOS/Module Name | NOS/Module Code & Version *(if applicable)* | Core/ Non-Core | NCrF/NSQF Level | Credits as per NCrF | Training Duration (Hours) | | | | | Assessment Marks | | | | | Weightage (%) *(if applicable)* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Th. | Pr. | OJT-Man. | OJT-Rec. | Total | Th. | Pr. | Proj. / Int. AM. Th. | Viva / Int. AM. Pr. | Total | |
| | and principles to perform practical operations. Understand and explain basic science in the field of study | | | | | | | | | | | | | | | |
| 16. | On the Job Training | | | 4.5 | 5 | | | 150 | | 150 | | | | | | |
| **Duration (in Hours) / Total Marks** | | | | | **30** | **270** | **480** | **150** | | **900** | **100** | **200** | **40** | **60** | **400** | |
| **TRAINING METHODOLOGY** | | | | | | | | | | | | | | | | |
| 17. | Plan & prepare the learners for the class using basics of educational psychology & motivational techniques. | MEP/N9401 V1.0 | Core | 4.5 | 1.5 | 12 | 33 | | | 45 | 7 | 24 | 2 | 4 | 37 | |
| 18. | Analyze the syllabus of the Course. | MEP/N9405 V1.0 | Core | 4.5 | 1 | 10 | 20 | | | 30 | 6 | 15 | 1 | 2 | 24 | |
| 19. | Plan & prepare the training session using various methods viz. 4 step method, question & questioning technique etc. | MEP/N9406 V1.0 | Core | 4.5 | 1 | 12 | 18 | | | 30 | 7 | 13 | 1 | 2 | 23 | |
| 20. | Communicate effectively with the trainees both verbally and nonverbally. | MEP/N9407 V1.0 | Core | 4.5 | 1 | 12 | 18 | | | 30 | 7 | 13 | 1 | 2 | 23 | |
| 21. | Use Instructional Technology & facilitate the training program. | MEP/N9408 V1.0 | Core | 4.5 | 1 | 12 | 18 | | | 30 | 7 | 13 | 1 | 2 | 23 | |
| 22. | Design written instructional materials and implement for imparting training. | MEP/N9409 V1.0 | Core | 4.5 | 1 | 12 | 18 | | | 30 | 7 | 13 | 1 | 2 | 23 | |

| S. No | NOS/Module Name | NOS/Module Code & Version *(if applicable)* | Core/ Non-Core | NCrF/NSQF Level | Credits as per NCrF | Training Duration (Hours) | | | | | Assessment Marks | | | | | Weightage (%) *(if applicable)* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Th. | Pr. | OJT-Man. | OJT-Rec. | Total | Th. | Pr. | Proj. / Int. AM. Th. | Viva / Int. AM. Pr. | Total | |
| 23. | Assess, evaluate and certify the tests. | MEP/N9410 V1.0 | Core | 4.5 | 1 | 12 | 18 | | | 30 | 7 | 13 | 1 | 2 | 23 | |
| 24. | Organize workshop and classroom learning observing instructional methods. | MEP/N9426 V1.0 | Core | 4.5 | 1 | 12 | 18 | | | 30 | 7 | 13 | 1 | 2 | 23 | |
| 25. | Counsel & mentor the trainees by identifying their Strength & Weaknesses. | MEP/N9428 V1.0 | Core | 4.5 | 1 | 10 | 20 | | | 30 | 5 | 15 | 1 | 2 | 23 | |
| 26. | Develop Entrepreneurship skills. | MEP/N9438 V1.0 | Core | 4.5 | 1 | 12 | 18 | | | 30 | 7 | 13 | 1 | 2 | 23 | |
| 27. | Apply ICT & Internet in training (computer-based training) and various types of Distance learning programmes. | MEP/N9439 V1.0 | Core | 4.5 | 1 | 10 | 20 | | | 30 | 5 | 15 | 1 | 2 | 23 | |
| 28. | Plan and conduct sessions to impart competency based skills and knowledge. | MEP/N9440 V1.0 | Core | 4.5 | 1 | 10 | 20 | | | 30 | 6 | 15 | 1 | 2 | 24 | |
| 29. | Apply Adult Learning Principles. | MEP/N9441 V1.0 | Core | 4.5 | 0.5 | 7 | 8 | | | 15 | 3 | 7 | 1 | 1 | 12 | |
| 30. | Develop and implement continuous professional development plan. | MEP/N9442 V1.0 | Core | 4.5 | 0.5 | 7 | 8 | | | 15 | 3 | 7 | 1 | 1 | 12 | |
| 31. | Develop employability skills for the industrial needs. | MEP/N9475 V1.0 | Core | 4.5 | 1 | 15 | 15 | | | 30 | 8 | 11 | 3 | 2 | 24 | |
| 32. | Develop future skills in Emerging Technology. | MEP/N9476 V1.0 | Core | 4.5 | 0.5 | 15 | 0 | | | 15 | 8 | | 2 | | 10 | |
| **Duration (in Hours) / Total Marks** | | | | | **15** | **180** | **270** | | | **450** | **100** | **200** | **20** | **30** | **350** | |
| **Grand Total** | | | | | **45** | **450** | **750** | **150** | | **1350** | **200** | **400** | **60** | **90** | **750** | |

Elective NOS/s:

| S. No | NOS/Module Name | NOS/Module Code & Version *(if applicable)* | Core/ Non-Core | NCrF/NSQF Level | Credits as per NCrF | Training Duration (Hours) | | | | | Assessment Marks | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Th. | Pr. | OJT-Man. | OJT-Rec. | Total | Th. | Pr. | Proj. | Viva | Total | Weightage (%) *(if applicable)* |
| 1. | | | | | | | | | | | | | | | | |
| 2. | | | | | | | | | | | | | | | | |
| **Duration (in Hours) / Total Marks** | | | | | | | | | | | | | | | | |

Optional NOS/s:

| S. No | NOS/Module Name | NOS/Module Code & Version *(if applicable)* | Core/ Non-Core | NCrF/NSQF Level | Credits as per NCrF | Training Duration (Hours) | | | | | Assessment Marks | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Th. | Pr. | OJT-Man. | OJT-Rec. | Total | Th. | Pr. | Proj. | Viva | Total | Weightage (%) *(if applicable)* |
| 1. | | | | | | | | | | | | | | | | |
| 2. | | | | | | | | | | | | | | | | |
| **Duration (in Hours) / Total Marks** | | | | | | | | | | | | | | | | |

**Note:** Distribution of marks shown above are indicative only

Assessment - Minimum Qualifying Percentage

*Please specify **any one** of the following:*

**Minimum Pass Percentage – Aggregate at qualification level: The minimum pass percent for Trade Practical, TM practical and Formative assessment is 60% & for all other subjects (Theory) is 40%. There will be no Grace marks.** *(Every Trainee should score specified minimum aggregate passing percentage at qualification level to successfully clear the assessment.)*

**Minimum Pass Percentage –NOS/Module-wise: %** *(Every Trainee should score specified minimum passing percentage in each mandatory and selected elective NOS/Module to successfully clear the assessment.)*

Section 3: Training Related

| | | |
|---|---|---|
| 1. | **Trainer's Qualification and experience in the relevant sector (in years)** *(as per NCVET guidelines)* | B.Voc/Degree in Electrical / Electrical & Electronics Engineering from AICTE/UGC recognized University with two years experience in relevant field.<br>OR<br>03 years Diploma in Electrical/ Electrical & Electronics Engineering from AICTE/recognized University/ board with five years experience in relevant field.<br>OR<br>Ex-serviceman from Indian Armed forces with 15 years of service in related field as per equivalency through DGR. Candidate should have undergone methods of instruction course or minimum 02 years of experience in technical training institute of Indian Armed forces.<br>OR<br>NTC/ NAC passed in Electrician trade with seven years experience in relevant field.<br><br>**Essential Qualification:**<br>National Craft Instructor Certificate (NCIC) in Electrician trade, in any of the variants under DGT. |
| 2. | **Master Trainer's Qualification and experience in the relevant sector (in years)** *(as per NCVET guidelines)* | **N/A** |
| 3. | **Tools and Equipment Required for Training** | ☒ Yes ☐ No (*If "Yes", details to be provided in Annexure)* |
| 4. | **In Case of Revised Qualification, Details of Any Up skilling Required for Trainer** | NA |

Section 4: Assessment Related

| | | |
|---|---|---|
| 1. | **Assessor's Qualification and experience in relevant sector (in years)** *(as per NCVET guidelines)* | **Same as point 1 of Section 3 (Trainer's qualification and experience)** |
| 2. | **Proctor's Qualification and experience in relevant sector (in years)** *(as per NCVET guidelines)* | **N/A** |
| 3. | **Lead Assessor's/Proctor's Qualification and experience in relevant sector (in years)** *(as per NCVET guidelines)* | **N/A** |
| 4. | **Assessment Mode** *(Specify the assessment mode)* | **Summative Assessment and Formative Assessment** |
| 5. | **Tools and Equipment Required for Assessment** | ☒ Same as for training ☐ Yes ☐ No *(details to be provided in Annexure-if it is different for Assessment)* |

## Section 5: Evidence of the need for the Qualification

*Provide Annexure/Supporting documents name.*

| | |
|---|---|
| 1. | **Latest Skill Gap Study (not older than 2 years) (Yes/No): N/A** |
| 2. | **Latest Market Research Reports or any other source (not older than 2 years) (Yes/No): N/A** |
| 3. | **Government /Industry initiatives/ requirement (Yes/No): YES** |
| 4. | **Number of Industry validation provided: NA** |
| 5. | **Estimated nos. of persons to be trained and employed: 150 per year** |
| 6. | **Evidence of Concurrence/Consultation with Line Ministry/State Departments: YES**<br>If "No", why: |

## Section 6: Annexure & Supporting Documents Check List

*Specify Annexure Name / Supporting document file name*

| | | |
|---|---|---|
| 1. | **Annexure:** NCrF/NSQF level justification based on NCrF level/NSQF descriptors *(Mandatory)* | Annexure: Evidence of Level |
| 2. | **Annexure:** List of tools and equipment relevant for qualification *(Mandatory, except in case of online course)* | Annexure: Tools and Equipment (Lab Set-Up) |
| 3. | **Annexure:** Detailed Assessment Criteria *(Mandatory)* | Annexure: Detailed Assessment Criteria |
| 4. | **Annexure:** Assessment Strategy *(Mandatory)* | Annexure: Assessment Strategy |
| 5. | **Annexure:** Blended Learning *(Mandatory, in case selected Mode of delivery is "Blended Learning")* | *N/A* |
| 6. | **Annexure:** Multiple Entry-Exit Details *(Mandatory, in case qualification has multiple Entry-Exit)* | Yes |
| 7. | **Annexure:** Acronym and Glossary *(Optional)* | Yes |
| 8. | **Supporting Document:** Model Curriculum *(Mandatory – Public view)* | Yes |
| 9. | **Supporting Document:** Career Progression *(Mandatory - Public view)* | Yes |
| 10. | **Supporting Document:** Occupational Map *(Mandatory)* | *N/A* |
| 11. | **Supporting Document:** Assessment SOP *(Mandatory)* | *https://dgt.gov.in/sites/default/files/Modified%20CITS-Prospectus%202022.pdf* |
| 12. | **Any other document you wish to submit:** | |

Annexure: Evidence of Level

| NCrF/NSQF Level Descriptors | Key requirements of the job role/ outcome of the qualification | How the job role/ outcomes relate to the NCrF/NSQF level descriptor | NCrF/NSQF Level |
|---|---|---|---|
| **Professional Theoretical Knowledge/Process** | **Demands Wide Range of Specialized Technical Skill, Clarity of Knowledge and Practice in Broad Range of Activity.**<br><br>• Demonstrate installations, testing and maintenance of batteries & solar cells.<br>• Train to estimate, assemble, install and test various wiring systems, winding and Insulating materials.<br>• Explain verification & measurement of different characteristics of Magnetic effect of electric current, parts of DC Generator, DC motor and Power factors.<br>• Evaluate testing, performance and maintenance of transformer.<br>• Monitor testing, check connections, verify errors, calibrate various instruments and electrical Illumination systems.<br>• Analyse detection of faults and troubleshooting of inverter, stabilizer, UPS etc. | The learner demonstrates wide range of specialized technical skills, clarity of knowledge as indicated in the learning outcomes like "Train to estimate, assemble, install and test various wiring systems, winding and Insulating materials" etc. to achieve the tolerance levels and accuracy demanded as per the job.<br><br>The learner explains broad range of activities as indicated in the learning outcomes like "Explain verification & measurement of different characteristics of Magnetic effect of electric current, parts of DC Generator, DC motor and Power factors" and "Evaluate testing, performance and maintenance of transformer" etc. The learner has to apply ones knowledge and decide what needs to be done to identify a fault/deficiency and decide how to rectify it or plan as per requirements of industrial standards.<br>Hence NSQF Level is 4.5 for this descriptor. | 4.5 |
| **Professional and Technical Skills/ Expertise/ Professional Knowledge** | **Factual and theoretical knowledge in broad contexts within the field of work or study.**<br><br>• Construction & Principle. Types-Series, Shunt & Compound Generator.<br>• Principle, Construction. Classification of Transformers, EMF equation, rating Loading, Losses & Efficiency Regulation.<br>• Laws of Illumination. Terminology used in Illumination.<br>• Construction, Working Principle, Starting Method. Effect of change of excitation on load. | The learner requires to demonstrate factual and theoretical knowledge in broad contexts within this field of work or study which is related to Electrician / Wireman trade which involves Principle, Construction and Classification of Transformers, EMF equation, rating Loading, Losses & Efficiency Regulation etc. The learner is expected to possess knowledge about the Laws of Illumination and Terminology used in Illumination. The learner applies factual and theoretical knowledge in broad contexts within the field of work or study. | 4.5 |

| | | | |
|---|---|---|---|
| | | Hence NSQF Level is 4.5 for this descriptor. | |
| **Employment Readiness & Entrepreneurship Skills & Mind-set/Professional Skill** | • Monitor testing, check connections, verify errors, calibrate various instruments and electrical Illumination systems.<br>• Assess Construction of simple electronic circuits and test for functioning.<br>• Ensure implementation of safe working practices, environment regulation and housekeeping.<br>• Explain verification & measurement of different characteristics of electrical circuits.<br>• Demonstrate planning, execution, commissioning and performance of various AC motors& Alternator/ MG set.<br>• Demonstrate estimation, testing, servicing &troubleshooting components of various domestic/industrial programmable systems & their control circuits. | The learning out comes like "Monitor testing, check connections, verify errors, calibrate various instruments and electrical Illumination systems" etc. require a range of cognitive and practical skills to generate solutions to specific problems in this field of study; then as per requirements decide which operations/procedures/tools will achieve desired result. In the learning outcomes for example "Explain verification & measurement of different characteristics of electrical circuits" etc., the learner is expected to plan the sequence of operations to maximum effectiveness; constantly checking and reviewing plan, etc., all of which involve problem solving and decision making.<br>Hence NSQF Level is 4.5 for this descriptor. | 4.5 |
| **Broad Learning Outcomes/Core Skill** | **Reasonably good in mathematical calculation and understanding of social/political**<br>• Demonstrate mathematical concept and principles to perform practical operations.<br>• Explain science in the field of study including simple machines.<br>**Reasonably good in data collecting organizing information and logical communication**<br>• Communicate effectively with the trainees both verbally and non-verbally.<br>• Plan & prepare the training session using various methods viz. 4 step method, question & questioning technique etc. | The learning outcomes for example "Demonstrate mathematical concept and principles to perform practical operations" and "Communicate effectively with the trainees both verbally and non-verbally" display the need where the learner is required to be reasonably good in mathematical calculation, needs to possess sound understanding of associated social & political issues, data collecting, organising information and logical communication in order to analyze and solve problems.<br><br>Hence NSQF Level is 4.5 for this descriptor. | 4.5 |
| **Responsibility** | • Demonstrate Planning, execution, commissioning and performance of various AC motors & Alternator/ MG set.<br>• Analyse detection of faults and troubleshooting of inverter, stabilizer, UPS etc.<br>• Demonstrate estimation, testing, servicing & | The role of Electrician is independently responsible for planning, execution and commissioning etc. for arranging, operating & maintaining various electrician equipments and ensuring prescribed tolerance limits/standards followed by analysis of what needs to be done | 4.5 |

| | | | |
|---|---|---|---|
| | troubleshooting components of various domestic/industrial programmable systems & their control circuits.<br>• Evaluate planning, execution, commissioning & evaluate performance of various conventional/non-conventional power generation, transmission & distribution components.<br>• Evaluate testing, performance and maintenance of transformer.<br>• Monitor testing, check connections, verify errors, calibrate various instruments and electrical Illumination systems.<br>• Demonstrate installations, testing and maintenance of batteries & solar cells.<br>• Ensure implementation of safe working practices, environment regulation and housekeeping. | based on their understanding of various industrial processes/equipments, selection of best parameters and working practices to achieve the desired standards/accuracy/precision level of industrial processes.<br><br>While learning outcomes like "Demonstrate estimation, testing, servicing & troubleshooting components of various domestic/industrial programmable systems & their control circuits" etc. shows responsibility for own work and learning as well as full responsibility for other's works and learning.<br><br>Hence NSQF Level is 4.5 for this descriptor. | |

## Annexure: Tools and Equipment (Lab Set-Up)

List of Tools and Equipment

**Batch Size: 25**

| S No. | Name of the Tool & Equipment | Specification | Quantity |
|---|---|---|---|
| **A. TRAINEES TOOL KIT** | | | |
| 1. | Steel Tape | 10 mtr length | 25+1 nos. |
| 2. | Plier Insulated | 150 mm | 25+1 nos. |
| 3. | Plier Side Cutting | 150 mm | 25+1 nos. |
| 4. | Screw Driver | 100 mm | 25+1 nos. |
| 5. | Screw Driver | 150 mm | 25+1 nos. |
| 6. | Electrician Connector, screw driver insulated handle thin stem | 100 mm | 25+1 nos. |
| 7. | Heavy Duty Screw Driver | 200 mm | 25+1 nos. |
| 8. | Electrician Screw Driver thin stem insulated handle | 250 mm | 25+1 nos. |
| 9. | Punch Centre | 150 mm X 9 mm | 25+1 nos. |
| 10. | Knife Double Bladed Electrician | standard | 25+1 nos. |
| 11. | Neon Tester | standard | 25+1 nos. |
| 12. | Steel Rule | 300 mm | 25+1 nos. |
| 13. | Hammer, cross peen with handle | standard | 25+1 nos. |
| 14. | Hammer, ball peen With handle | standard | 25+1 nos. |
| 15. | Gimlet | 6 mm. | 25+1 nos. |
| 16. | Bradawl | standard | 25+1 nos. |
| 17. | Scriber (Knurled centreposition ) | standard | 25+1 nos. |
| 18. | Pincer | 150 mm | 25+1 nos. |
| 19. | Wire Stripper | standard | 25+1 nos. |
| 20. | Tennon Saw | 250 mm | 25+1 nos. |
| 21. | Firmer chisel wood | 12mm | 25+1 nos. |
| **B. INSTRUMENT AND GENERAL SHOP OUTFIT** | | | |
| 22. | C- Clamp | 200 mm, 150 mm and 100 mm | 2 Nos each |
| 23. | Spanner Adjustable | 150 mm, 15 degree | 2 Nos |
| 24. | Blow lamp | 0.5 ltr | 2Nos |
| 25. | Melting Pot | standard | 1No |
| 26. | Ladel | standard | 2Nos |
| 27. | Chisel Cold firmer | 25 mm X 200 mm | 2 Nos |
| 28. | Chisel | 25 mm & 6 mm | 4 Nos each |

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| 29. | Hand Drill Machine | 0 to 6 mm capacity | 1No |
| 30. | Portable Electric Drill Machine | 6 mm capacity | 1No |
| 31. | Pillar Electric Drill Machine | 12 mm capacity | 1No |
| 32. | Allen Key | standard | 1 set |
| 33. | Oil Can | 0.12 ltr | 2 Nos |
| 34. | Grease Gun | standard | 1 No |
| 35. | Out Side Micrometer | 0 to 25 mm | 1No |
| 36. | Motorized Bench Grinder | standard | 1No |
| 37. | Rawl plug tool & bit | standard | 2 sets |
| 38. | Pulley Puller | 3 legs 250 mm adjustable | 2Nos |
| 39. | Bearing Puller le | 3 legs 120 mm flexi | 2Nos |
| 40. | Hydrometer | standard | 2 sets |
| 41. | Thermometer | 0 to 100 deg Centigrade | 1 No |
| 42. | Scissors blade | 150 mm | 4 Nos |
| 43. | Crimping Tool | standard | 1 set |
| 44. | Crimping Tools Heavy duty | standard | 2 Nos |
| 45. | Chisel Cold flat | 12 mm | 2 Nos |
| 46. | Mallet hard wood | 0.50 kg | 4 Nos |
| 47. | Hammer Exeter type | 0.40 kg | 8 Nos |
| 48. | Hacksaw frame | 200 mm 300 mm adjustable | 4 Nos |
| 49. | Try Square | 150 mm blade | 4 Nos |
| 50. | Outside & Inside Divider Caliper | standard | 2 Nos. each |
| 51. | Pliers flat nose | 100 mm | 4 Nos. |
| 52. | Pliers round nose | 100 mm | 4 Nos. |
| 53. | Plier longnose | 150 mm | 4 Nos. |
| 54. | Tweezers | 100 mm | 4 Nos |
| 55. | Snip Straight & Bent | 150 mm | 2 Nos. each |
| 56. | Spanner D.E. metric standard | standard | 4 Nos. |
| 57. | Drill hand brace | 0 to 100 mm | 4 Nos. |
| 58. | Drill S.S. Twist block | 2 mm, 5 mm 6 mm set of 3 | 4 sets |
| 59. | Plane, smoothing cutters | 50 mm | 4 Nos. |
| 60. | Gauge, wire imperial(SWG) | standard | 4 Nos. |
| 61. | File flat | 200 mm 2nd cut | 8 Nos. |
| 62. | File half round | 200mm2nd cut | 4 Nos. |
| 63. | File round | 200 mm 2nd cut | 4 Nos. |
| 64. | File flat | 150 mm rough | 4 Nos. |
| 65. | File flat | 250 mm bastard | 4 Nos. |

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| 66. | File flat | 250 mm smooth | 4 Nos. |
| 67. | File Rasp, half round | 200 mm bastard | 4 Nos. |
| 68. | Soldering Iron | 25 watt, 65 watt, 125 watt | 4 Nos. each |
| 69. | Copper bit soldering iron | 0.25 kg. | 4 Nos. |
| 70. | De soldering Gun | standard | 4 Nos. |
| 71. | Hand Vice | 50 mm jaw | 4 Nos. |
| 72. | Table Vice | 100 mm jaw | 8 Nos. |
| 73. | Pipe Cutter to cut pipes | up to 5 cm. dia | 2 Nos. |
| 74. | Pipe Cutter to cut pipes | above 5 cm dia | 1 No |
| 75. | Stock and Die set for | 20 mm to 50 mm G.I. pipe | 1 No |
| 76. | Ohm Meter; Series Type & Shunt Type | standard | 1 No each |
| 77. | Stock and Dies conduit | standard | 4 Nos. |
| 78. | Multi Meter (analog) | 0 to 1000 M Ohms, 2.5 to 500 V | 1 No |
| 79. | Digital Multi Meter | 3 ½ digit | 8 Nos. |
| 80. | A.C. Voltmeter | M.I. 0 –500V A.C | 1 No |
| 81. | Milli Voltmeter | standard | 6 Nos. |
| 82. | D.C. Milliammeter | 0 -500m A (Digital+ Analog) | 1 No |
| 83. | Ammeter | MC 0-1A, 0-5 A, 0- 25 A | 1 No |
| 84. | A.C. Ammeter | standard | 2 Nos. each |
| 85. | A.C. Ammeter | M.I 0-10 -20 A, 0-15-25 A | 2 Nos. each |
| 86. | Kilo Wattmeter | 0-5 kw (CC-0-5-10 A,PC-0-250-500V) | 2 Nos. |
| 87. | A.C. Energy Meter, | Single phase 5 amp. Three Phase 15 amp | 2 Nos. |
| 88. | Power Factor Meter | single phse-230 volt (Analog+ Digital) | 1 No each |
| 89. | Frequency Meter (Analog & Digital) | Analog & Digital | 1 No each |
| 90. | Tachometer with stop watch | Analog & Digital | 1 No each |
| 91. | Current Transformer Primary- | 0-10-20 A, Sec- 5 A) | 2 Nos |
| 92. | Potential Transformer | 0-230-400V/110V | 2 Nos |
| 93. | Growler Internal+ External | standard | 1 No each |
| 94. | Tong Tester / Clamp Meter | 0 – 100 amp. AC Analog+ Digital) | 1No |
| 95. | Megger | 500 volts | 1No |
| 96. | Wheat Stone Bridge with galvanometer & battery | standard | 1No |
| 97. | Earth Tester | 0-30 Ohm | 2 Nos |
| 98. | Contactor & auxiliary contacts | 3 phase, 440 volt, 32 amp. | 1 No each |
| 99. | Load Bank5 KW (Lamp / heater Type) | standard | 1No |
| 100. | Brake Test arrangement with two spring balance 0 to 25 kg rating | standard | 2 sets |
| 101. | DC Power Supply 0-440v , 15A | standard | 2 Nos |
| 102. | Inverter- Input- 12 volt DC, Output- 220 volt AC | 1 KVA with 12 V Battery | 1No |

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| 103. | Voltage Stabilizer Input:<br>AC Output: | 150 – 230 volt<br>220 volt AC, 1 KVA | 1 No |
| 104. | Rheostat | 0 -1 Ohm, 5 Amp<br>0 -10 Ohm, 5 Amp<br>0- 25 Ohm, 10Amp<br>0-300Ohm,3Amp | 2 Nos each |
| 105. | Flux meter | standard | 2 Nos |
| 106. | Laboratory Type Induction Coil | standard | 1 No |
| **C. MACHINERIES** | | | |
| 107. | Used DC Generators-series, shunt and compound type for overhauling practice | standard | 2 Nos |
| 108. | D.C. Shunt Generator with control panel, | 2.5 KW, 230 V | 1No |
| 109. | D.C. Compound Generator with control panel including fitted rheostat, voltmeter, ammeter and breaker | 2.5KW,230V | 1No |
| 110. | DC Series Motor coupled with mechanical load | 0.5 to 2 HP, 220 Volts | 1No |
| 111. | DC Shunt Motor | 2 to 3 HP, 220 volts | 1No |
| 112. | DC compound Motor with starter and switch | 2 to 3 HP, 220 volts | 1No |
| 113. | **Electrical Machine Trainer –**<br>Suitable for demonstrating the construction and functioning of different types of DC machines and AC machines (single phase and three phase). Should be fitted with friction brake arrangement, dynamometer, instrument panel and power supply unit. | standard | 1No |
| 114. | **Motor-Generator (AC to DC) consisting of**: Squirrel Cage Induction Motor with star-delta starter and directly coupled to DC shunt generator and switch board mounted with regulator, air breaker, ammeter, voltmeter, knife blade switches and fuses, set complete with case iron and plate, fixing bolts, foundation bolts and flexible coupling.<br>Induction Motor rating:<br>Shunt Generator rating: | 7 HP, 400V, 50 cycles, 3 phase<br>5 KW, 440V | 1No |
| 115. | **Motor Generator(DC to AC) set consisting of-**<br>Shunt Motor with starting compensator and switch directly coupled to AC generator with exciter and switch board mounted with regulator, breaker, ammeter, voltmeter frequency meter, knife blade switch and fuses etc. Set | 5 HP, 440V<br>3-Phase, 4 wire, 3.5 KVA, 400/230 Volts, 0.8 pf, | 2 Nos. |

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| | complete with cast iron bed plate, fixing bolts, foundation bolts and flexible coupling.<br>Shunt Motor rating:<br>AC Generator rating: | 50cycles | |
| 116. | Thyristor /IGBT controlled D.C. motor drive with Tacho–generator feedback arrangement. | 2 HP | 1 No |
| 117. | Thyristor /IGBT controlled A.C. motor drive with VVVF control | 3 Phase, 2 HP | 1 No |
| 118. | Diesel Generator Set with change-over switch, over current breaker and water-cooled with armature, star-delta connections AC. | 3phase,5KVA,<br>230 volt | 1No |
| 119. | AC Squirrel Cage Motor with star delta starter and triple pole iron clad switch fuse. | 2 to 3 HP, 3-phase ,400 volts, 50 cycles | 2Nos |
| 120. | AC phase-wound slip ring Motor with starter and switch. | 5 HP, 400 volts, 3-phase, 50 cycles | 1No |
| 121. | A.C. Series type Motor with mechanical load. | ¼ HP, 230V, 50 cycles | 1No |
| 122. | Single Phase Capacitor Motor with starter switch. | 1 HP 230 volt 50 cycles | 1No |
| 123. | Universal Motor with starter/switch | 230 volt, 50 cycles ¼ HP | 1No |
| 124. | Stepper Motor with Digital Controller | standard | 1No |
| 125. | Shaded Pole Motor | standard | 1No |
| 126. | Servo Motor with Control | standard | 1 No |
| 127. | Cut model | 3 phase induction motor | 1 No |
| 128. | Cut model of watermill and hydro power | standard | 1 No each |
| **D. GENERAL INSTALLATIONS** | | | |
| 129. | Oscilloscope Dual Trace, | 30 MHZ | 1No |
| 130. | Function Generator | standard | 1No |
| 131. | Discrete Component Trainer | standard | 1No |
| 132. | 3- point D.C. Starter | standard | 2 Nos |
| 133. | 4- point D.C. Starter | standard | 2 Nos |
| 134. | Single phase Transformer, core type, air cooled | standard | 3 Nos |
| 135. | Three phase transformer, shell type oil cooled | standard | 1 No |
| 136. | Variable Auto Transformer | standard | 1 No |
| 137. | Linear I.C.Trainer | standard | 1No |
| 138. | Digital I.C.Trainer | standard | 1 No |
| 139. | Bath Impregnating | standard | 1 No |
| 140. | Oven Stove | standard | 1 No |
| 141. | Oil Testing Kit | standard | 1 No |
| 142. | Battery | 12 v | 1 No |

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| 143. | Battery Charger | standard | 1 No |
| 144. | Solar panel with Battery | 18watt | 1 set |
| 145. | Hygrometer | standard | 1 No |
| 146. | Domestic Appliances-<br>a. Electric Hot Plate<br>b. Electric Kettle,<br>c. Electric Iron<br>d. Immersion Heater<br>e. A.C. Fan<br>f. Geyser (Storage type)<br>g. Mixture &Grinder.<br>h. Microwave Oven<br>i. Washing Machine<br>j. Hair Drier<br>k. Induction Heater | 1500 watt,220v with temp. control<br>1750 watts,230v<br>1500 watts,230v with temp. Control<br>750/1000/1500 watt,230V<br>230v<br>25 ltrminimum,230V<br>20 Ltr convection<br>6.5 kg fully automatic | 2Nos<br><br>2Nos<br>2Nos<br><br>2Nos<br>1 No<br>2 Nos<br>2Nos<br>1 No<br>2 Nos |
| 147. | Relays-<br>a. Cutout<br>b. Reverse current<br>c. Overcurrent<br>d. Under voltage | standard | 1 no. each |
| 148. | Starters for -<br>a. Resistance type starter<br>b. Direct on-line Starter<br>c. Star Delta Starter-manual, semi-automatic and automatic<br>d. Auto Transformer type | 2 to 5 H.P. A.C Motors | 1 No each |
| 149. | Synchronous scope Meter | standard | 2 Nos |
| 150. | Phase Sequence Meter | standard | 2 Nos |
| 151. | Component of Typical small hydro power unit | standard | 1 set |
| 152. | Component of Typical water mill | standard | 1 set |
| 153. | EV Charger | 3 phase input | 1 No. |
| 154. | EV Charger (Home) | 1 Phase input | 1 No. |
| | | | |

Classroom Aids
The aids required to conduct sessions in the classroom are:

1.

## Annexure: Industry Validations Summary

*Provide the summary information of all the industry validations in table. This is not required for OEM qualifications.*

| S. No | Organization Name | Representative Name | Designation | Contact Address | Contact Phone No | E-mail ID | LinkedIn Profile *(if available)* |
|---|---|---|---|---|---|---|---|
| 1. | | | | | | | |
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| 3. | | | | | | | |
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| 10. | | | | | | | |

## Annexure: Training & Employment Details

**Training and Employment Projections: N/A**

| Year | Total Candidates | | Women | | People with Disability | |
|---|---|---|---|---|---|---|
| | Estimated Training # | Estimated Employment Opportunities | Estimated Training # | Estimated Employment Opportunities | Estimated Training # | Estimated Employment Opportunities |
| | | | | | | |
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*Data to be provided year-wise for next 3 years*

**Training, Assessment, Certification, and Placement Data for previous versions of qualifications: N/A**

| Qualification Version | Year | Total Candidates | | | | Women | | | | People with Disability | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Trained | Assessed | Certified | Placed | Trained | Assessed | Certified | Placed | Trained | Assessed | Certified | Placed |
| | | | | | | | | | | | | | |
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*Applicable for revised qualifications only, data to be provided year-wise for past 3 years.*

**List Schemes in which the previous version of Qualification was implemented: N/A**

1.
2.

**Content availability for previous versions of qualifications:**

☒ Participant Handbook ☒ Facilitator Guide ☒ Digital Content ☒ Qualification Handbook ☐ Any Other:

**Languages in which Content is available: English/ Hindi**

Annexure: Blended Learning

**Blended Learning Estimated Ratio & Recommended Tools: N/A**

***Refer NCVET "Guidelines for Blended Learning for Vocational Education, Training & Skilling" available on:***
*https://ncvet.gov.in/sites/default/files/Guidelines%20for%20Blended%20Learning%20for%20Vocational%20Education,%20Training%20&%20Skilling.pdf*

| S. No. | Select the Components of the Qualification | List Recommended Tools – for all Selected Components | Offline: Online Ratio |
|---|---|---|---|
| 1 | ☐Theory/ Lectures - Imparting theoretical and conceptual knowledge | | |
| 2 | ☐Imparting Soft Skills, Life Skills, and Employability Skills /Mentorship to Learners | | |
| 3 | ☐Showing Practical Demonstrations to the learners | | |
| 4 | ☐Imparting Practical Hands-on Skills/ Lab Work/ workshop/ shop floor training | | |
| 5 | ☐Tutorials/ Assignments/ Drill/ Practice | | |
| 6 | ☐Proctored Monitoring/ Assessment/ Evaluation/ Examinations | | |
| 7 | ☐ On the Job Training (OJT)/ Project Work Internship/ Apprenticeship Training | | |

## Annexure: Detailed Assessment Criteria

Detailed assessment criteria for each NOS/Module are as follows:

| NOS/Module Name | Assessment Criteria for Performance Criteria/Learning Outcomes | Theory Marks | Practical Marks | Project Marks/ Internal Assessment (Theory) | Viva Marks/ Internal Assessment (Practical) |
|---|---|---|---|---|---|
| **TRADE TECHNOLOGY** | | | | | |
| 1. Ensure implementation of safe working practices, environment regulation and housekeeping. (NOS: PSS/9415) | Explain procedures to achieve a safe working environment in line with occupational health and safety regulations and requirements and according to site policy. | 0.28 | 1 | 0.14 | 0.28 |
| | Check and report all unsafe situations according to site policy. | 0.28 | 0.5 | 0.14 | 0.28 |
| | Demonstrate necessary precautions on fire and safety hazards and report according to site policy and procedures. | 0.29 | 1 | 0.15 | 0.29 |
| | Classify, handle and store / dispose off dangerous goods and substances according to site policy and procedures following safety regulations and requirements. | 0.28 | 0.5 | 0.14 | 0.28 |
| | Evaluate and observe site policies and procedures in regard to illness or accident. | 0.29 | 1 | 0.14 | 0.29 |
| | Demonstrate basic first aid and use them under different circumstances. | 0.29 | 1 | 0.14 | 0.29 |
| | Explain different fire extinguisher and use the same as per requirement. | 0.29 | 1 | 0.15 | 0.29 |
| | **Total Marks** | **2** | **6** | **1** | **2** |
| 2. Explain verification & measurement of different characteristics of electrical circuits. (NOS: PSS/9416) | Explain verification of characteristics of series, parallel and its combination circuit using Ohm`s law and Kirchhoff's Laws. | 0.4 | 1.5 | 0.2 | 0.4 |
| | Analyze the effect of the short and open in series and parallel circuits. | 0.4 | 1 | 0.2 | 0.4 |
| | Explain verification of relation of voltage components of RLC series circuit in AC. | 0.4 | 1.5 | 0.2 | 0.4 |
| | Identify the phase sequence of a 3 ø supply using a phase-sequence meter. | 0.4 | 1 | 0.2 | 0.4 |
| | Group the given capacitors to get the required capacity and voltage rating. | 0.4 | 1 | 0.2 | 0.4 |

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| | **Total Marks** | **2** | **6** | **1** | **2** |
| 3. Demonstrate Installations, testing and maintenance of batteries & solar cells. (NOS: PSS/9417) | Demonstrate assembling a DC source 6V/500 mA using 1.5V cells. | 1 | 3.5 | 0.25 | 1.5 |
| | Determine the internal resistance of cell and make grouping of cells. | 1 | 2.5 | 0.25 | 0.5 |
| | Appraise installation and maintenance of batteries. | 1 | 2.5 | 0.25 | 0.5 |
| | Determine total number of cells required for a given power requirement. | 1 | 2.5 | 0.25 | 0.5 |
| | **Total Marks** | **4** | **11** | **1** | **3** |
| 4. Train to estimate, assemble, install and test various wiring systems, winding and Insulating materials. (NOS: PSS/9418) | Ensure Compliance with Safety Regulation 2010 when performing the wiring. | 0.36 | 1 | 0.09 | 0.27 |
| | Plan Preparation and mounting of the energy meter board. | 0.36 | 1 | 0.1 | 0.27 |
| | Evaluate drawing and wire up the consumers main board with ICDP switch and distribution fuse box. | 0.37 | 1 | 0.09 | 0.28 |
| | Assess the types of fuses their ratings and applications. | 0.36 | 1 | 0.09 | 0.27 |
| | Check the parts of a relay, MCB & ELCB and its operation. | 0.36 | 1 | 0.09 | 0.27 |
| | Estimate the cost of material for wiring in PVC channel for an office room having 2 lamps, 1 Fan, one 6A socket outlet and wire up. | 0.37 | 1 | 0.09 | 0.27 |
| | Estimate the requirement for conduit wiring (3 phase) and wire up. | 0.36 | 1 | 0.09 | 0.28 |
| | Estimate the materials and wire up the lighting circuit for a godown. | 0.37 | 1 | 0.09 | 0.27 |
| | Estimate the materials and wire up a lighting circuit for a corridor in conduit. | 0.37 | 1 | 0.09 | 0.28 |
| | Test, locate the fault and repair a domestic wiring installation. | 0.36 | 1 | 0.09 | 0.27 |
| | Check testing of burnt out DC machine for re- winding. | 0.36 | 1 | 0.09 | 0.27 |
| | **Total Marks** | **4** | **11** | **1** | **3** |
| 5. Explain verification & measurement of different characteristics of Magnetic effect of electric current, parts of DC Generator, DC motor and Power factors. (NOS: PSS/9416) | Explain measurement of the power and energy in a single & three phase circuit using wattmeter and energy meter with CT and PT. | 1 | 2.64 | 0.36 | 1 |
| | Determine the power factor by direct and indirect methods in an AC single phase RLC parallel circuit. | 1 | 2.63 | 0.36 | 0.5 |
| | Explain construction of solenoid and determine its polarity for the given direction of current. | 1 | 2.64 | 0.37 | 1 |
| | Monitor a connection of lamp load in star and delta and | 1 | 2.63 | 0.36 | 1 |

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| | determine relationship between line and phase values with precaution. | | | | |
| | Explain connection of balanced and unbalanced loads in 3 phase star system and to measure the power of 3 phase loads. | 1 | 2.64 | 0.36 | 0.5 |
| | Evaluate measurement of electrical parameters using tong tester in three phase circuits. | 1 | 2.64 | 0.37 | 1 |
| | Determine the load performance of different types of DC generator on load. | 1 | 2.64 | 0.36 | 1 |
| | Explain to connect, start, run and reverse direction of rotation of different types of DC motors. | 1 | 2.64 | 0.37 | 1 |
| | Review the load performance tests on different type of DC motor. | 1 | 2.63 | 0.37 | 0.5 |
| | Explain controlling the speed of a DC motor by different method. | 1 | 2.64 | 0.36 | 1 |
| | Plan to maintain, service and trouble shoot the DC motor starter. | 1 | 2.63 | 0.36 | 0.5 |
| | **Total Marks** | **11** | **29** | **4** | **9** |
| 6. Evaluate testing, performance and maintenance of transformer. (NOS: PSS/9419). | Plan work in compliance with standard safety norms related with transformer. | 0.36 | 1 | 0.1 | 0.27 |
| | Explain the types of transformers and their specifications. | 0.36 | 1 | 0.2 | 0.27 |
| | Verify the transformation ratio of a single phase transformer. | 0.37 | 1 | 0.2 | 0.28 |
| | Evaluate connection and testing of a single phase auto-transformer. | 0.36 | 1 | 0.2 | 0.27 |
| | Determine the losses (iron loss and copper loss) and the regulation of a single phase transformer at different loads. | 0.36 | 1 | 0.2 | 0.27 |
| | Assess measurement of the current and voltage using CT and PT. | 0.37 | 1 | 0.2 | 0.27 |
| | Plan to carry out winding for small transformer of 1KVA rating. | 0.36 | 1 | 0.2 | 0.28 |
| | Test the transformer oil with oil testing kit. | 0.37 | 1 | 0.2 | 0.27 |
| | Check connection of 3 single phase transformers for 3 phase operation of - a) delta-delta b) delta-star c) star-star d) star-delta. | 0.37 | 1 | 0.2 | 0.28 |
| | Plan to connect the given two single phase transformers a) parallel b) series (secondary only) and measure voltage. | 0.36 | 1 | 0.1 | 0.27 |
| | Assess connection& testing of3 phase transformer in | 0.36 | 1 | 0.2 | 0.27 |

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| | parallel. (Parallel operation). | | | | |
| | **Total Marks** | **4** | **11** | **2** | **3** |
| 7. Monitor testing, check connections, verify errors, calibrate various instruments and electrical Illumination systems. (NOS: PSS/9420) | Monitor calibration of different meters viz. PMMC, MI etc. | 1.5 | 3 | 0.5 | 1 |
| | Plan connection & installation of all kinds of lamps. | 1.5 | 3.5 | 0.5 | 1 |
| | Assess connection of single & twin tube light fittings. | 1.5 | 3.5 | 0.5 | 1 |
| | Monitor connection, installation and testing the HPMV & HPSV lamp with accessories. | 1.5 | 3 | 0.5 | 1 |
| | Monitor testing of a decorative serial lamp set for 240 V using 6V bulb and flasher. | 1.5 | 3.5 | 0.5 | 1 |
| | Monitor installation of light fitting for show case window lighting. | 1.5 | 3.5 | 0.5 | 1 |
| | **Total Marks** | **9** | **20** | **3** | **6** |
| 8. Assess Construction of simple electronic circuits and test for functioning. (NOS: PSS/9421) | Monitor soldering on components, lug and board with safety. | 0.36 | 1 | 0.09 | 0.27 |
| | Identify the passive /active components by visual appearance, Code number and check testing for their condition. | 0.36 | 1 | 0.1 | 0.27 |
| | Identify the control and functional switches in CRO and assess measurement of the D.C. & A.C. voltage, frequency and time period. | 0.37 | 1 | 0.09 | 0.28 |
| | Assess construction and review testing of half &full wave rectifiers with and without filter circuits. | 0.36 | 1 | 0.09 | 0.27 |
| | Monitor construction of circuit by using transistor as a switch. | 0.36 | 1 | 0.09 | 0.27 |
| | Evaluate construction and testing of a UJT as relaxation oscillator & electronic timer. | 0.37 | 1 | 0.09 | 0.27 |
| | Assess construction of amplifier circuit using Transistor, FET and JFET and testing. | 0.36 | 1 | 0.09 | 0.28 |
| | Plan to Construct and test lamp dimmer using TRIAC/DIAC. | 0.37 | 1 | 0.09 | 0.27 |
| | Test IGBT and use in circuit for suitable operation. | 0.37 | 1 | 0.09 | 0.28 |
| | Plan to construct and test the universal motor speed controller using SCR with safety. | 0.36 | 1 | 0.09 | 0.27 |
| | Appraise construction and testing of logic gate circuits. | 0.36 | 1 | 0.09 | 0.27 |
| | **Total Marks** | **4** | **11** | **1** | **3** |
| 9. Demonstrate Planning, execution, commissioning and | Assess circuit diagram drawing and connection of forward & reverse 3 phase squirrel cage induction motor. | 0.61 | 1.61 | 0.22 | 0.5 |
| | Plan to start, run and reverse an AC 3 phase squirrel cage | 0.61 | 1.61 | 0.22 | 0.5 |

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| performance of various AC motors& Alternator/ MG set. (NOS: PSS/9422) | induction motor by different type of starters. | | | | |
| | Evaluate measurement of the slip of 3 phase squirrel cage induction motor by tachometer for different output. Check Drawing of slip/load characteristics of the motor. | 0.61 | 1.61 | 0.22 | 0.5 |
| | Determine the efficiency of 3 phase squirrel cage induction motor by no load test/ blocked rotor test and brake test. | 0.61 | 1.61 | 0.22 | 0.5 |
| | Plot the speed torque (Slip/Torque) characteristics of slip ring induction motor. | 0.61 | 1.61 | 0.22 | 0.5 |
| | Monitor speed control of 3 phase induction motor. | 0.61 | 1.61 | 0.22 | 0.5 |
| | Demonstrate planning to connect, start and run a 3 phase synchronous motor. | 0.61 | 1.61 | 0.22 | 0.5 |
| | Demonstrate planning to connect start, run, control speed and reverse the DOR of different type of single phase motors. | 0.61 | 1.61 | 0.22 | 0.5 |
| | Assess installation of a single phase AC motor. | 0.61 | 1.61 | 0.22 | 0.5 |
| | Test continuity and insulation of various AC motors. | 0.61 | 1.61 | 0.22 | 0.5 |
| | Assess maintenance, service and troubleshooting of the AC motor & starter. | 0.61 | 1.61 | 0.22 | 0.5 |
| | Ensure planned work in compliance with standard safety norms related with Alternator & MG set. | 0.61 | 1.61 | 0.22 | 0.5 |
| | Demonstrate planning to connect start and run an alternator and build up the voltage. | 0.62 | 1.62 | 0.23 | 0.5 |
| | Determine the load performance of a 3 phase alternator. | 0.62 | 1.62 | 0.23 | 0.5 |
| | Assess starting and loading of a MG set with 3 phase induction motor coupled to DC shunt generator and build up the voltage. | 0.61 | 1.61 | 0.22 | 0.5 |
| | Evaluate alignment of MG set. | 0.61 | 1.61 | 0.23 | 0.5 |
| | Appraise preventive and breakdown Maintenance of alternator / MG set. | 0.61 | 1.61 | 0.22 | 0.5 |
| | Explain the effect of excitation current in terms of V-curves of synchronous motor. | 0.61 | 1.61 | 0.23 | 0.5 |
| | **Total Marks** | **11** | **29** | **4** | **9** |
| 10. Analyse detection of faults and troubleshooting of inverter, stabilizer, UPS etc. (NOS: PSS/9423) | Analyse operation and maintenance of inverter. | 0.29 | 1 | 0.14 | 0.29 |
| | Evaluate planning to troubleshoot, service and maintain a voltage stabilizer. | 0.29 | 1 | 0.15 | 0.29 |
| | Assess the parts, trace the connection and test the DC regulated power supply with safety. | 0.28 | 1 | 0.14 | 0.28 |

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| | Evaluate troubleshooting and servicing a DC regulated power supply. | 0.29 | 1 | 0.15 | 0.29 |
| | Monitor battery charger for its operation. | 0.28 | 1 | 0.14 | 0.28 |
| | Evaluate preparation of an emergency light. | 0.29 | 0.5 | 0.14 | 0.29 |
| | Appraise maintenance of UPS. | 0.28 | 0.5 | 0.14 | 0.28 |
| | **Total Marks** | **2** | **6** | **1** | **2** |
| 11. Demonstrate estimation, testing, servicing & troubleshooting components of various domestic/industrial programmable systems & their control circuits. (NOS: PSS/N9414) | Evaluate the parts, trace the connection and test the control panels of the equipments. | 0.46 | 1.13 | 0.17 | 0.34 |
| | Assess assembling of the various parts of control panels. | 0.46 | 1.13 | 0.16 | 0.33 |
| | Explain the wiring as per the drawings including terminations. | 0.46 | 1.12 | 0.17 | 0.34 |
| | Assess troubleshooting and servicing of various controls in the panels. | 0.46 | 1.13 | 0.17 | 0.33 |
| | Explain battery connections and maintenance. | 0.46 | 1.13 | 0.16 | 0.34 |
| | Test battery charger for its operation. | 0.46 | 1.12 | 0.17 | 0.33 |
| | Evaluate planning of work in compliance with standard safety norms related with domestic appliances. | 0.46 | 1.13 | 0.16 | 0.34 |
| | Monitor service and Repair of calling bell/ buzzer/ Alarm. | 0.46 | 1.12 | 0.17 | 0.33 |
| | Explain service and repair an automatic iron. | 0.46 | 1.12 | 0.16 | 0.33 |
| | Assess repair and service of oven having multi-range heat control. | 0.46 | 1.13 | 0.17 | 0.34 |
| | Check replacing the heating element in a kettle and test. | 0.46 | 1.12 | 0.16 | 0.33 |
| | Appraise service and repair of an induction heater. | 0.46 | 1.12 | 0.17 | 0.34 |
| | Monitor service and repair of a geyser. | 0.46 | 1.13 | 0.16 | 0.33 |
| | Assess service and repair of a mixer. | 0.46 | 1.12 | 0.17 | 0.33 |
| | Evaluate service and repair of washing machine. | 0.46 | 1.13 | 0.17 | 0.34 |
| | Monitor service and repair of table fan. | 0.46 | 1.13 | 0.16 | 0.33 |
| | Demonstrate service, repair and installation of ceiling fan. | 0.46 | 1.12 | 0.17 | 0.33 |
| | Ensure Compliance with Safety Regulation 2010 when performing the Industrial wiring. | 0.46 | 1.13 | 0.17 | 0.33 |
| | Monitor wire-up PVC Conduit wiring for lighting circuit & 3 phase motor circuit with due care and safety. | 0.45 | 1.12 | 0.16 | 0.34 |
| | 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 Safety Regulation 2010. | 0.46 | 1.13 | 0.17 | 0.33 |
| | Ensure termination to the feeder cable in bus bar & to | 0.45 | 1.13 | 0.17 | 0.33 |

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| | service cable through plug-in box with due care and safety. | | | | |
| | Assess erection of a bus bar chamber on an angle iron board and wire-up for 3 phase induction motor with due care and safety. | 0.45 | 1.12 | 0.17 | 0.33 |
| | Determine the size of cable for main & distribution board of a workshop. | 0.45 | 1.12 | 0.17 | 0.33 |
| | Evaluate testing of an industrial wiring installation by using Megger. | 0.46 | 1.12 | 0.17 | 0.33 |
| | **Total Marks** | **11** | **27** | **4** | **8** |
| 12. Evaluate planning, execution, commissioning & performance of various conventional/non-conventional power generation, transmission & distribution components. (NOS: PSS/9424) | Assess preparation of single line diagram of thermal, hydel, solar and wind power plants. | 0.76 | 1.92 | 0.31 | 0.62 |
| | Monitor preparation of layout plan and single line diagram of transmission line. | 0.77 | 1.92 | 0.3 | 0.6 |
| | Evaluate drawing of overhead and domestic service line. | 0.77 | 1.93 | 0.31 | 0.62 |
| | Assess erection of an overhead service line pole for single phase 240v distribution system. | 0.77 | 1.92 | 0.3 | 0.62 |
| | Explain different types of insulators used in HT and LT line. | 0.77 | 1.93 | 0.31 | 0.62 |
| | Assess connection of feeder cable with domestic service line. | 0.77 | 1.92 | 0.3 | 0.62 |
| | Ensure plans to work in compliance with solar panel installation norms. | 0.77 | 1.92 | 0.31 | 0.6 |
| | Assess combination of solar cells for given power requirement. | 0.77 | 1.92 | 0.31 | 0.62 |
| | Explain assembling and installation of solar panel. | 0.77 | 1.92 | 0.31 | 0.62 |
| | Evaluate the functionality of solar panel. | 0.77 | 1.92 | 0.31 | 0.62 |
| | Demonstrate preparation of layout plan and single line diagram of Distribution substation. | 0.77 | 1.93 | 0.31 | 0.62 |
| | Illustrate application of relays in control circuits and examine its operation. | 0.77 | 1.93 | 0.31 | 0.62 |
| | Judge identification of parts of circuit breaker and check its operation. | 0.77 | 1.92 | 0.31 | 0.6 |
| | **Total Marks** | **10** | **25** | **4** | **8** |
| 13. Demonstrate installation and troubleshooting of Electric Vehicle charging stations. (NOS: PSS/9425) | Demonstrate installation of EV charging Station for Public places/ Home. | 1 | 4 | 0.5 | 1 |
| | Demonstrate troubleshooting of EV charging stations. | 1 | 4 | 0.5 | 1 |
| | **Total Marks** | **2** | **8** | **1** | **2** |
| 14. Read and apply | Read & interpret the information on drawings and apply in | 4 | | 2 | |

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| engineering drawing for different application in the field of work. (NOS: PSS/N9411) | executing practical work. | | | | |
| | Read &analyze the specification to ascertain the material requirement, tools and assembly/maintenance parameters. | 4 | | 2 | |
| | Encounter drawings with missing/unspecified key information and make own calculations to fill in missing dimension/parameters to carry out the work. | 4 | | 2 | |
| | **Total Marks** | **12** | | **6** | |
| 15. Demonstrate basic mathematical concept and principles to perform practical operations. Understand and explain basic science in the field of study. (NOS: PSS/N9412) | Solve different mathematical problems | 6 | | 3 | |
| | Explain concept of basic science related to the field of study | 6 | | 3 | |
| | **Total Marks** | **12** | | **6** | |
| **TRAINING METHODOLOGY** | | | | | |
| 1. Plan & prepare the learners for the class using basics of educational psychology &motivational techniques. (NOS: MEP/N9401) | Implement techniques based on psychological parameters like Personality, Aptitude, Skills, values and Potentials. | 1.4 | 4.8 | 0.4 | 0.8 |
| | Use different experiments on theories of learning by the different psychologists and their effect in learning situation and relation with Laws of learning. | 1.4 | 4.8 | 0.4 | 0.8 |
| | Demonstrate on Modality Learning (Auditory, Visual and Kinesthetic modality). | 1.4 | 4.8 | 0.4 | 0.8 |
| | Set Questionnaire on personality development for assessing the psychological attributes. | 1.4 | 4.8 | 0.4 | 0.8 |
| | Motivate trainees for the training session. | 1.4 | 4.8 | 0.4 | 0.8 |
| | **Total Marks** | **7** | **24** | **2** | **4** |
| 2. Analyze the syllabus of the Course. (NOS: MEP/N9405) | Select salient points on designing a training curriculum. | 1 | 2.5 | 0.2 | 0.3 |
| | Analyse a sample syllabus. | 1 | 2.5 | 0.1 | 0.3 |
| | Discuss Elements of skills, Outlines of a syllabus. | 1 | 2.5 | 0.2 | 0.4 |
| | Make project work on making break up of syllabus and list of topics - Video show/PPT of ADDIE Model. | 1 | 2.5 | 0.2 | 0.4 |
| | Design schedule of instructions. | 1 | 2.5 | 0.1 | 0.3 |
| | Construct a sample course using principles of teaching. | 1 | 2.5 | 0.2 | 0.3 |
| | **Total Marks** | **6** | **15** | **1** | **2** |
| 3. Plan & prepare the training session using various methods viz. 4 step method, question & questioning technique etc. (NOS: MEP/N9406) | Set questions on different levels of learning in psychomotor domain according to Bloom Taxonomy. | 1.75 | 3.25 | 0.25 | 0.5 |
| | Demonstrate the steps of imparting skills. | 1.75 | 3.25 | 0.25 | 0.5 |
| | Prepare lesson plan and demonstration plan using 4 Step methods. | 1.75 | 3.25 | 0.25 | 0.5 |
| | Use questioning techniques. | 1.75 | 3.25 | 0.25 | 0.5 |
| | **Total Marks** | **7** | **13** | **1** | **2** |

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| 4. Communicate effectively with the trainees both verbally and nonverbally. (NOS: MEP/N9407) | Identify the process of communication. | 2.5 | 4.5 | 0.3 | 0.7 |
| | Use verbal & non-verbal communication to convey messages, pre-listening activity and respond to them. | 2 | 4 | 0.4 | 0.6 |
| | Communicate effectively with the trainees in training session. | 2.5 | 4.5 | 0.3 | 0.7 |
| | **Total Marks** | **7** | **13** | **1** | **2** |
| 5. Use Instructional Technology & facilitate the training program. (NOS: MEP/N9408) | Use various instructional Technologies viz. OHP, Digital Camera, LCD projector, smart board etc. | 2.5 | 4.5 | 0.3 | 0.7 |
| | Plan and design charts, transparencies, slides, posters, mock-ups etc. | 2 | 4 | 0.4 | 0.6 |
| | Conduct micro teaching sessions. | 2.5 | 4.5 | 0.3 | 0.7 |
| | **Total Marks** | **7** | **13** | **1** | **2** |
| 6. Design written instructional materials and implement for imparting training. (NOS: MEP/N9409) | Plan & prepare different WIM viz. Operation sheet, Job sheet, Information Sheet, Assignment Sheet, Experiment Sheet, Experiment Sheet, Final Job Check Sheet etc. | 3.5 | 6.5 | 0.5 | 1 |
| | Maintain various records viz. Daily Dairy, Progress Chart, Theory &Practical records etc. | 3.5 | 6.5 | 0.5 | 1 |
| | **Total Marks** | **7** | **13** | **1** | **2** |
| 7. Assess, evaluate and certify the tests. (NOS: MEP/N9410) | Identify different types of test & its necessity. | 1 | 2 | 0.1 | 0.3 |
| | Set different types of question on different levels of learning in cognitive domain according to Bloom Taxonomy. | 1 | 2 | 0.2 | 0.3 |
| | Set an ideal question paper & evaluate. | 1.5 | 2.5 | 0.2 | 0.4 |
| | Apply various evaluation techniques & marking schemes. | 1.5 | 2.5 | 0.2 | 0.4 |
| | Undertake competence-based assessment as per standards. | 1 | 2 | 0.2 | 0.3 |
| | Conduct formative assessment and summative assessment. | 1 | 2 | 0.1 | 0.3 |
| | **Total Marks** | **7** | **13** | **1** | **2** |
| 8. Organize workshop and classroom learning observing instructional methods. (NOS: MEP/N9426) | Carry out management of Workshop &Class room. | 1.75 | 3.25 | 0.25 | 0.5 |
| | Demonstrate group teaching and learning. | 1.75 | 3.25 | 0.25 | 0.5 |
| | Explain housekeeping & safety rules in Instructional area. | 1.75 | 3.25 | 0.25 | 0.5 |
| | Conduct debate on quality Concept & 5'S. | 1.75 | 3.25 | 0.25 | 0.5 |
| | **Total Marks** | **7** | **13** | **1** | **2** |
| 9. Counsel & mentor the trainees by identifying their Strength & Weaknesses. (NOS: MEP/N9428) | Handle trainee's grievances. | 1 | 3 | 0.2 | 0.4 |
| | Boost Morale of trainees. | 1 | 3 | 0.2 | 0.4 |
| | Conduct SWOT analysis for identifying their Strength & Weaknesses. | 1 | 3 | 0.2 | 0.4 |
| | Plan and Prepare the parameters for skills required to become a good trainer. | 1 | 3 | 0.2 | 0.4 |
| | Write a good CV. | 1 | 3 | 0.2 | 0.4 |
| | **Total Marks** | **5** | **15** | **1** | **2** |
| 10. Develop Entrepreneurship | Use effective leadership Traits. | 1.4 | 2.6 | 0.2 | 0.4 |

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| skills. (NOS: MEP/N9438) | Apply Stress management techniques. | 1.4 | 2.6 | 0.2 | 0.4 |
| | Plan & Use Time management techniques. | 1.4 | 2.6 | 0.2 | 0.4 |
| | Interpret the sequence of operation for setting up a small business from the flow sequence diagram | 1.4 | 2.6 | 0.2 | 0.4 |
| | Analyze the impact of quality and list the importance of quality. | 1.4 | 2.6 | 0.2 | 0.4 |
| | **Total Marks** | **7** | **13** | **1** | **2** |
| 11. Apply ICT & Internet in training (computer-based training) and various types of Distance learning programmes. (NOS: MEP/N9439) | Use internet, Email application, Fax etc. | 1 | 3 | 0.2 | 0.4 |
| | Prepare transparency sheet with the help of computer. | 1 | 3 | 0.2 | 0.4 |
| | Prepare Slides by Power Point. | 1 | 3 | 0.2 | 0.4 |
| | Conduct Interactive Class on Video Conference. | 1 | 3 | 0.2 | 0.4 |
| | Install and commission equipments at Spokes level. | 1 | 3 | 0.2 | 0.4 |
| | **Total Marks** | **5** | **15** | **1** | **2** |
| 12. Plan and conduct sessions to impart competency based skills and knowledge. (NOS: MEP/N9440) | Interpret one LO, QP, NOS for NSQF alignment. | 1.5 | 3.75 | 0.25 | 0.5 |
| | Explain learning outcomes. | 1.5 | 3.75 | 0.25 | 0.5 |
| | Identify different roles of NSDA, NSDC and SSC. | 1.5 | 3.75 | 0.25 | 0.5 |
| | Apply techniques to create and maintain a positive learning environment. | 1.5 | 3.75 | 0.25 | 0.5 |
| | **Total Marks** | **6** | **15** | **1** | **2** |
| 13. Apply Adult Learning Principles. (NOS: MEP/N9441) | Apply adult learning in simulated environment. | 0.75 | 1.75 | 0.25 | 0.25 |
| | Identify various factors affecting adult learning | 0.75 | 1.75 | 0.25 | 0.25 |
| | Use role plays using the principles of adult learning. | 0.75 | 1.75 | 0.25 | 0.25 |
| | Apply techniques to create and maintain a positive learning environment. | 0.75 | 1.75 | 0.25 | 0.25 |
| | **Total Marks** | **3** | **7** | **1** | **1** |
| 14. Develop and implement continuous professional development plan. (NOS: MEP/N9442) | Develop a professional development plan to enhance professional capabilities. | 1.5 | 3.5 | 0.5 | 0.5 |
| | Implement CPD in instructor career. | 1.5 | 3.5 | 0.5 | 0.5 |
| | **Total Marks** | **3** | **7** | **1** | **1** |
| 15. Develop employability skills for the industrial needs. (NOS: MEP/N9475) | Implement sentences for different situations and rearrange words to create meaningful sentences. | 3 | 4 | 1 | 0.7 |
| | Exhibit communications skills to manage conflicts & handle criticism in work place. | 2 | 3 | 1 | 0.6 |
| | Demonstrate report to become a good entrepreneur. | 3 | 4 | 1 | 0.7 |
| | **Total Marks** | **8** | **11** | **3** | **2** |
| 16. Develop future skills in Emerging Technology. (NOS: MEP/N9475) | Explain common types of cyber-attacks | 0.7 | | 0.2 | |
| | Explain the applications of Data Analytics | 0.7 | | 0.2 | |
| | Explain Artificial Intelligence and its different types. | 0.6 | | 0.1 | |
| | Explain what AI can do and can't do | 0.7 | | 0.2 | |
| | Applications of AI in different fields. | 0.7 | | 0.2 | |
| | Explain Machine Learning steps | 0.6 | | 0.1 | |
| | Explain features/types/benefits of Robotic Process Automation software tools | 0.7 | | 0.2 | |

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| | Features, benefits and applications of IoT | 0.7 | | 0.2 | |
| | Explain types of block chain | 0.6 | | 0.1 | |
| | Basic concepts of Cloud Computing | 0.7 | | 0.2 | |
| | Types of 3D printing, advantages and disadvantages. | 0.7 | | 0.2 | |
| | Basic concepts of AR/VR/XR | 0.6 | | 0.1 | |
| | **Total Marks** | **8** | **0** | **2** | **0** |
| **Grand Total** | | **100** | **200** | **20** | **30** |

**Note:** Distribution of marks shown above are indicative only

Annexure: Assessment Strategy

**(1) Assessment process:**

Assessment and Certification of all the trainees will be carried out as per Directorate General of Training (DGT) norms for the trade theory including practical portion conducted in NSTI/IToT workshop. The assessment for the qualification is carried out by conducting formative assessments and summative assessment (end-of-year examination). The internal assessment for each learning outcome is carried out by the concerned trainer for evaluating the knowledge and skill acquired by trainees and the behavioural transformation of the trainees. This internal assessment is primarily 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, and internal assessment marks are awarded to them. Theory and practical examinations are conducted in Trade Technology, Engineering Technology and Training Methodology. The question papers for the theory Examinations contain objective type questions. The practical examination at the end of training is conducted at NSTI / IToTs and the marks are uploaded in the portal accordingly.

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

| Sl. No. | Subject | | Marks | Internal Assessment | Full Marks | Pass Marks | |
|---|---|---|---|---|---|---|---|
| | | | | | | Exam | Internal Assessment |
| 1. | Trade Technology | Trade Theory | 100 | 40 | 140 | 40 | 24 |
| | | Trade Practical | 200 | 60 | 260 | 120 | 36 |
| 2. | Training Methodology | TM Theory | 100 | 20 | 120 | 40 | 12 |
| | | TM Practical | 200 | 30 | 230 | 120 | 18 |
| Total Marks | | | **600** | **150** | **750** | **320** | **90** |

**(2) Minimum pass marks:**

The minimum pass percent for Trade Practical, TM practical Examinations and Formative assessment is 60% & for all other subjects is 40%.There will be no Grace marks.

**(3) Testing and certifications for the course:**

Controller of examinations, DGT carries out the assessment and issues National Craft Instructor Certificates (NCIC) 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 and impart 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 formative discussions to assess understanding and evaluating 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 Technology, Engineering Technology and Training Methodology.
- While Trade Theory and Trade Practical are used for assessing Trade-related jobs, Workshop Calculation and Science is used to test trainee's numerical skills, Drawing is used to test the ability of the trainee to draw and read sketches and Training Methodology is used to test teaching skills.
- In addition to demonstration of theory and practical knowledge, overall personality of the trainees is also assessed.

**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 Training Methodology is done by third-party agency.
- Trade Practical is examined by External Examiner.

Annexure: Acronym and Glossary

Acronym

| Acronym | Description |
|---|---|
| **AA** | Assessment Agency |
| **AB** | Awarding Body |
| **ISCO** | International Standard Classification of Occupations |
| **NCO** | National Classification of Occupations |
| **NCrF** | National Credit Framework |
| **NOS** | National Occupational Standard(s) |
| **NQR** | National Qualification Register |
| **NSQF** | National Skills Qualifications Framework |
| **OJT** | On the Job Training |

Glossary

| Term | Description |
|---|---|
| **National Occupational Standards (NOS)** | NOS define the measurable performance outcomes required from an individual engaged in a particular task. They list down what an individual performing that task should know and also do. |
| **Qualification** | A formal outcome of an assessment and validation process which is obtained when a competent body determines that an individual has achieved learning outcomes to given standards |
| **Qualification File** | A Qualification File is a template designed to capture necessary information of a Qualification from the perspective of NSQF compliance. The Qualification File will be normally submitted by the awarding body for the qualification. |
| **Sector** | A grouping of professional activities on the basis of their main economic function, product, service or technology. |
| **Long Term Training** | Long-term skilling means any vocational training program undertaken for a year and above. https://ncvet.gov.in/sites/default/files/NCVET.pdf |