



ANALOG & DIGITAL INSTRUMENTATION TECHNICIAN



QUALIFICATION FILE

**Ministry of Micro, Small and Medium
Enterprises, New Delhi
(MSME-Technology Centre)**

NSQF QUALIFICATION FILE

Version 6: Draft of 08 March 2016

CONTACT DETAILS OF THE BODY SUBMITTING THE QUALIFICATION FILE

Name and address of submitting body:

O/o DC (MSME),
Ministry of Micro, Small and Medium Enterprises
Nirman Bhawan,
Maulana Azad Road,
New Delhi - 110108

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. Curriculum Document

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SUMMARY

Qualification Title	Analog and Digital Instrumentation Technician
Qualification Code	MSME/ADIT/56
Nature and purpose of the qualification	Nature: Certificate course Purpose: The successful trainees will be qualified to carry out the task of installation of electronics equipments. The trained candidates are qualified to efficiently carry out work as an operator in automation and process control industries. They can also work as electronic mechanic.
Body/bodies which will award the qualification	MSME-Technology Centre, Ministry of Micro, Small & Medium Enterprises, New Delhi
Body which will accredit providers to offer courses leading to the qualification	MSME-Technology Centre, Ministry of Micro, Small & Medium Enterprises, New Delhi
Body/bodies which will carry out assessment of learners	Examination Cell of MSME Technology Centre
Occupation(s) to which the qualification gives access	Instrumentation Technician(Operator), Installation and Service Engineer (in Automation & Process Control Industries), Entrepreneur
Licensing requirements	Nil
Level of the qualification in the NSQF	4
Anticipated volume of training/learning required to complete the qualification	1560 hours
Entry requirements and/or recommendations	12th passed in 10+2 scheme with Science/ITI in Electronics/Electrical/Wireman
Progression from the qualification	As the qualification is carrier oriented the qualifying trainee will be eligible to be: 1. Absorbed by the industry as Instrumentation Technician. After completion of 1 year they will be eligible to work as Senior Instrumentation Technician. After completion of 2-3 years they will be eligible to work as Instrumentation Engineer.
Planned arrangements for the Recognition of Prior learning (RPL)	Yes. Mentioned in detail in Section 1.
International comparability where known	Not known
Date of planned review of the qualification.	May 2018
Formal structure of the qualification	

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Title of the component and identification code	Mandatory/Optional	Estimated size (learning hours)	Level
Basic Electrical	Mandatory	250	4
Computer Awareness	Mandatory	119	4
Electronics Devices & Circuits	Mandatory	297	4
Digital Electronics & Microprocessor	Mandatory	298	4
Industrial Instrumentation	Mandatory	298	4
Repair, Maintenance Skills & Production Techniques	Mandatory	298	4

Please refer curriculum document for details.

SECTION 1 ASSESSMENT

Body/Bodies which will carry out assessment:

Examination Cell of MSME Technology Centre

How will RPL assessment be managed and who will carry it out?

Learners who claim to have prior experience will be assessed and if found to have knowledge and skills meeting the outcomes of any or more components will be recognized and dealt accordingly. However there can be prior learning of varying levels and each person cannot be grouped in the same category. So a full assessment will be carried out to find out the level of the claimant.

The assessment will be carried out by examination cell of MSME-Technology Centre, Ministry of Micro, Small & Medium Enterprises, New Delhi.

Describe the overall assessment strategy and specific arrangements which have been put in place to ensure that assessment is always valid, consistent and fair and show that these are in line with the requirements of the NSQF:

1. ASSESSMENT GUIDELINE:

- Criteria for assessment based on each learning outcomes, will be assigned marks proportional to its importance.
- The assessment for the theory & practical part is based on knowledge bank of questions created by Examination cell of MSME Technology Centre
- For each individual batch, Examination cell will create unique question papers for theory part as well as practical.

- Assessment comprises the following components:

>Job carried out in labs/workshop

>Record book/daily diary

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>Answer sheet of assessment

>Viva-voce

- Apart from above assessment we also observe the trainee on the following components:

>Assignments

>Attendance and punctuality

2. ASSESSORS:

Faculty of MSME-Technology Centre, Ministry of Micro, Small & Medium Enterprises, New Delhi assesses the students as per guidelines set by Examination cell of MSME Technology Centre. Faculties are been trained from time to time to upgrade their skills on various aspects such as teaching methodology, conduction of assessments etc. These training are usually conducted at various places prominent among them are NITTTR, Chandigarh and other tool rooms in the country.

3. ELIGIBILITY TO APPEAR IN THE EXAM:

To be eligible to appear in the examination a student must have minimum 75% attendance. This however does not apply to candidates appearing in the examination based on their prior learning.

4. MARKING SCHEME:

Sr. No.	Method of Assessments	Weightage (Max. marks)	Evaluator
1	Written test	40	As nominated by the Examination cell
2	Practical test	60	
Total		100	

5. PASSING MARKS:

Passing criteria is based on marks obtained in written, practical test and viva-voce.

Minimum marks to pass: Written test- 40%

Practical test- 60%

6. RESULTS AND CERTIFICATION:

The result is based on the marks obtain in the evaluation. Evidences are recorded in the form of marks obtained in answer sheet, practical and viva-voce. Certificates are awarded to successful candidates.

ASSESSMENT EVIDENCE

Title of Component: Analog and Digital Instrumentation Technician

Sr. No.	Outcomes to be assessed	Assessment criteria for the outcome
1	Install electronics equipments.	Ability to <ol style="list-style-type: none">1. Observe safety during work.2. Ensure proper step by step procedure of

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		<p>installation.</p> <ol style="list-style-type: none"> 3. Train end-user on product. 4. Handover product to customer.
2	Carry out the work as an operator in automation and process control industries.	<p>Ability to</p> <ol style="list-style-type: none"> 1. Understand the responsibility of the operator as assigned by the supervisor. 2. Carry out the operation in an accurate and synchronous manner with that of the process line. 3. Carry out documentation in inventory data control.
3	Work as electronic mechanic.	<p>Ability to</p> <ol style="list-style-type: none"> 1. Observe safety precautions while working with electricity. 2. Observe precautions while handling industrial process instruments. 3. Assess and diagnose the problem reported. 4. Read the product manual. 5. Observe the overall system. 6. Give estimate of the time required to accomplish the repair. 7. Repair faulty parts. 8. Test system for its proper functioning.
<p>Means of assessment 1 and 2</p> <p>Skill performance is assessed by conducting</p> <ol style="list-style-type: none"> i) Written test for each course ii) Final written test for all course iii) Practical exam for each practical component iv) Final practical test for all practical components v) Final viva-voce 		
<p>Pass/Fail</p> <p>Passing criteria is based on marks obtained in written, practical test and viva-voce. The minimum pass percentage for each means of assessment is given below-</p> <ol style="list-style-type: none"> i) Written test- 40% ii) Practical test-60% 		

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SECTION 2

EVIDENCE OF LEVEL

Option A

Title/Name of qualification/component: Analog and Digital Instrumentation Technician			Level: 4
NSQF Domain	Outcomes of the Qualification/Component	How the job role relates to the NSQF level descriptors	NSQF Level
Process	<ul style="list-style-type: none"> Work in process industries to operate different electronic systems. Operate in process line to produce product. Repair faulty instrument and parts. 	A technician works in three kinds of assignments- operation, assembly, servicing & maintenance. The environment in which he works is familiar to him and predictable. He is highly in demand in process industries. As such there are plenty of jobs available. For this he needs to have thorough knowledge of his domain and should execute the job to the satisfaction of the supervisor. In a process industry the job is monotonous and a similar routine is followed throughout the day. Hence it is pegged at level 4.	4
Professional knowledge	<ul style="list-style-type: none"> Knowledge of thyristors, transducers, sensors and relays, PLC and AC/DC drives. Knowledge of computer and data processing. 	A technician has to have an overall idea of the process line in which he is operating. Because any lagging in his operation will delay the further production of the line. In servicing & maintenance he has to have thorough knowledge of all the parts of the system. Knowledge of computer also helps him to process documents. Hence it is pegged at level 4.	4
Professional skill	<ul style="list-style-type: none"> Soldering, Repairing, Assembly, PLC programming. 	The range of applications in which a technician works is narrow and repetitive. A technician should demonstrate skills like accuracy, efficiency and swiftness. A technician should also be alert in case of any accidents and should handle the situation accordingly. He should be safety conscious.	4
Core skill	<ul style="list-style-type: none"> Do basic mathematical calculations. Identify, select and maintain various tools used by a technician. Handle tools and equipments appropriately. 	Technician should communicate with the supervisor to get the proper know-how of the operation and to know the responsibility. He should also communicate back to the supervisor to provide information and feedback. Similar communication is also required with co-operators. He should know the appropriate handling of tools and equipments.	4

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	<ul style="list-style-type: none">• Communicate with supervisor and co-operator.		
Responsibility	<ul style="list-style-type: none">• Responsible for his own work within specified timeline.	Since the operator is responsible for his own work assigned the job role is rightly placed at level 4. He should keep improving himself by observing his own work and others.	4

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SECTION 3

EVIDENCE OF NEED

What evidence is there that the qualification is needed?

Large numbers of industries are operating and a lot many industries are bound to come up in the future as consumption capacity increases. The goods produced in industries come up after a series of assembly operations. Here an operator is required in each stage of the production line. This points to the conclusion that the qualification of Electronics and Instrumentation Technician is required.

What is the estimated uptake of this qualification and what is the basis of this estimate?

There are a lot of process industries in every industrial area. These industries require skilled and trained manpower in the field of instrumentation. This suggests for a batch size of 50 - 60 students. Also from our past records almost 80% of the students are placed. This is directing us to estimate a batch of 50-60 students.

What steps were taken to ensure that the qualification(s) does/do not duplicate already existing or planned qualifications in the NSQF?

After an extensive study of the NOS and QPs of the various skill sectors we found that the qualification of Electronics and Instrumentation Technician is unique and there is no duplication with any other occupational standard.

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?

The process of taking feedback is periodically undertaken at our end. However it is not possible to update the qualification at that periodicity. The feedback is reviewed, brainstormed and accepted /rejected based on its merit. A review date has been fixed as mentioned in 'Date of planned review of the qualification'.

SECTION 4

EVIDENCE OF RECOGNITION AND PROGRESSION

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?

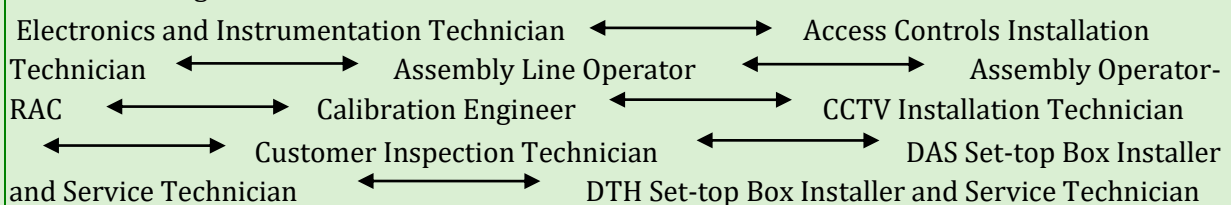
Vertical Progression

Assembly Supervisor, Electronic Mechanic, Installation and Service Engineer



Electronics and Instrumentation Technician

Horizontal Progression



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