

ADVANCED DIPLOMA IN MACHINE MAINTENANCE AND AUTOMATION (ADMMA)

QUALIFICATION FILE

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

NSQF QUALIFICATION FILE

Version 6: Draft of 08 March 2016

NSDA Reference

CONTACT DETAILS OF THE AWARDING BODY FOR THE QUALIFICATION

Name and Address of Awarding Body:

MSME Technology Centre,
B-36, Chandaka Industrial Area
Bhubaneswar-751024
Odisha

Name and Contact Details of Individual dealing with submission:

L.Raja Sekhar
Dy. General Manager
Contact No. +91 9437491950
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List of documents submitted in support of the Qualification File:

1. Detailed Curriculum (Ref: Annexure-I)

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SUMMARY

Qualification Title:

ADVANCED DIPLOMA IN MACHINE MAINTENANCE AND AUTOMATION

Nature and Purpose of the Qualification: Advanced diploma Course

Code: MSME / ADMMA / 44

Purpose:

Learners who attain this qualification can

- Perform maintenance activities of different workshop machines and equipment.
- Measure and control process equipment
- Calibrate in accordance with approved procedures.

Body/bodies which will award the Qualification:

Ministry of Micro, Small and Medium Enterprises, New Delhi
(Certificate awarded by MSME Technology Centre, Bhubaneswar)

Body which will accredit providers to offer courses leading to the qualification:

Ministry of Micro, Small and Medium Enterprises, New Delhi

Body/bodies which will be responsible for assessment:

Examination Cell of Central Tool Room and Training Centre, Bhubaneswar

Occupation(s) to which the Qualification gives access:

Entrepreneur/ Maintenance Engineer / Automation Engineer.

Proposed level of the Qualification in the NSQF:

Level-6

Anticipated volume of training /learning required to complete the Qualification:

6 month (780 Hours)

Entry requirements/recommendations:

Preferably Diploma in Electrical/Instrumentation or equivalent Engineering pass.

Progression from the qualification:

After completion of course and after 3 years of field experience the trainee can work as a Service engineer and after that 5 years of experience, the person can work as Maintenance Engineer/Maintenance Supervisor.

Planned arrangements for the Recognition of Prior Learning (RPL)

Yes

International comparability where known:

US: - ATS Applied Tech Systems LLC. Conduct a modular skill development programme whose title is 'Maintenance of Automation System' for 8 days duration. However, the course is focused on Maintenance of Automation System only. It does not speak about maintenance of Machineries used in manufacturing sector.

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Formal Structure of the Qualification:

Title of component	Mandatory/ optional	Estimated size (learning hours)	Level
Machine Operation	M	60	Level-6
Electrical Hardware Logic Control	M	60	Level-6
Electrical Machines	M	60	Level-6
Pneumatics & Hydraulics	M	90	Level-6
Machine Maintenance	M	90	Level-6
Programmable Logic Controller	M	90	Level-6
SCADA & HMI	M	60	Level-6
TIA- Portal	M	60	Level-6
Communication Skill	M	30	Level-6
AUTOCAD Electrical	M	90	Level-6
Basic Electronics	M	90	Level-6
Total		780	

Please attach any document giving further detail about the structure of the qualification – e.g. a Curriculum Document or a Qualification Pack.

Give the titles and other relevant details of the document(s) here. Include page references showing where to find the relevant information.

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SECTION 1

ASSESSMENT

Body/Bodies which will carry out Assessment:

Examination Cell of Central Tool Room and Training Centre, Bhubaneswar

Will the Assessment Body be responsible for RPL Assessment?

Yes

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

Learners who have met the requirements of any Unit Standard that forms part of this qualification may apply for recognition of prior learning to the relevant Education body. The applicant must be assessed against the specific outcomes and with the assessment criteria for the relevant Unit Standards.

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 outcome, will be assigned marks proportionately to its importance.
- The assessment for the theory & practical part is based on knowledge bank of questions created by trainers and approved by Examination cell (CTTC, Bhubaneswar)
- For each Individual batch, Examination cell will create unique question papers for theory part as well as practical for each examination.
- To pass the Qualification, every trainee should score a minimum of 70% cumulatively (Theory and Practical)
- Assessment comprises the following components:
 - Job carried out in labs/workshop
 - Record book/ daily diary
 - Answer sheet of assessment
 - Viva –voce
 - Progress chart
 - Attendance and punctuality

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2. ASSESSORS:

CTTC, Bhubaneswar faculty looking after the course “**ADVANCED DIPLOMA IN MACHINE MAINTENANCE AND AUTOMATION**”, also assesses the students as per guidelines set by Examination cell of CTTC, Bhubaneswar. Faculties have been trained from time to time to upgrade their skills on various aspects such as conduct of assessments, teaching methodology etc. These training are usually conducted at Xavier Institute of Management (XIMB), Bhubaneswar, Xavier Labor Relations Institute (XLRI), Jamshedpur and other renowned Institutions/Establishments of the country.

3. ELIGIBILITY TO APPEAR IN THE EXAM:

Minimum 80% attendance is compulsory for the students to appear for the assessments.

4. MARKING SCHEME:

Sr.No.	Method of Assessments	Weightage (Max. marks)	Evaluator
1	Written Test	20	Trainer + Course coordinator + Examiner nominated by Examination Cell of CTTC, Bhubaneswar
2	Practical Test	40	
3	Viva-voce	10	
4	Class/Workshop/Lab performance	10	
5	Project	20	
TOTAL		100	

5. PASSING MARKS:

Passing criteria is based on marks obtained in attendance record, term works, assignments, practical performance, viva or oral exam, module test, practical exam and final exam.

Minimum Marks to pass practical exam – 60%

Minimum Marks to pass theory exam – 40%

6. RESULTS AND CERTIFICATION:

The assessment results are backed by evidences collected by assessors. Successful trainees are awarded the certificates by CTTC, Bhubaneswar.

ASSESSMENT EVIDENCE:

Assessment evidence comprises the following components document in the form of records:

- 1) Job carried out in labs/workshop
- 2) Record book/ daily diary
- 3) Answer sheet of assessment
- 4) Viva –voce
- 5) Progress chart
- 6) Attendance and punctuality

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Title of Component: Machine Operation

Outcome to be assessed	Assessment criteria for the outcome
Understand safety precautions. Demonstrate machines.	Use PPE while working in the workshop.
Demonstrate on measuring instruments Lathe machine operation- Working, mechanism, R.P.M. calculation	Use Vernier- caliper, micrometer, height gauge and other measuring instrument.
Demonstrate the parts of lathe machine and their function.	Identify all the parts and mechanism used in lathe.
Demonstrate standard operating procedure (SOP) for lathe.	Use SOP for the manufacturing of parts.
Demonstrate operation on milling machine.	Identify the parts and its function of milling machine and follow the SOP for manufacturing.
Demonstrate operation on grinding machine.	Identify the parts and its function of grinding machine and follow the SOP for operation.
Demonstrate the de-burring process and its importance.	De-burr the work-piece after machining.
Means of assessment-1	
Assessing the daily work schedule sheet.	
Conducting written test after completion of this component	
Means of assessment-2	
Assessing the daily work schedule sheet.	
Conducting skill test after completion of this component.	
Pass/Fail	
Scoring more than 40% in written test and more than 60% in practical test will be declared as competent.	
Otherwise, he/she will be declared as not yet competent.	

Title of Component: Electrical Hardware Logic Control

Outcome to be assessed	Assessment criteria for the outcome
Demonstrate fundamental of electricity.	Identify, dismantle, sketch & assemble different electrical accessories.
Demonstrate measuring instrument for electrical parameters.	Use multi-meters for measurements of voltage, current & continuity.
Demonstrate symbols of the electrical components like M.C.B., Starter, Fuse, and Bell etc.	Use Series and parallel circuit and Prepare small circuit.

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Demonstrate types of domestic and industrial wiring & JIC symbol, IEC symbol.	Identify types of wiring, draw one line diagram using standard symbols and do the wiring.
Demonstrate about types of electrical control switches.	Identify the types of switches and design control circuits for AC & DC loads.
Demonstrate different electro-mechanical switching components as: relay, contactor and timer.	Use relay, contactor & timer in various control logic. Do the connection of relay and contactors for motor control logic as: start stop, forward reverse.
Demonstrate about different sensors as: proximity inductive, proximity capacitive, proximity optical.	Identify and test the connecting terminals for input & output signal of the sensors.
Means of assessment-1 Assessing the daily work schedule sheet. Conducting written test after completion of this component.	
Means of assessment-2 Assessing the daily work schedule sheet. Conducting practical test after completion of study of all switches.	
Pass/Fail Scoring more than 40% in written test and more than 60% in practical (Model) test will be declared as competent. Otherwise, he/she will be declared as not yet competent.	

Title of Component: Electrical Machines

Outcome to be assessed	Assessment criteria for the outcome
Demonstrate Magnetism and classification of magnets, care and maintenance, methods of magnetizing & magnetic materials.	Install, test and run of an electric DC motors.
Demonstrate electromagnetism, cork screw rule, right hand rules. Faradays laws, Lenz's law and Principle and Application of D.C. motor and generators.	Install & test a DC Generator and M.G. set.
Demonstrate Principle of Single phase and three phase motor and its application.	Install and test an electric single phase AC motors and An electric 3 phase motor by a D.O.L. starter.
Demonstrate Principle of three phase motor and its application.	Install and test an electric 3 phase motor by a Star and Delta starter.

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Demonstrate about Transformer, use and application.

Do Short and open circuit test of 1 phase transformer.

Demonstrate about star and delta conversion of transformer.

Check transformer terminals &do Star and Delta conversion of a 3 phase transformer.

Demonstrate Power measurement methods for Resistive load, Inductive load.

Do the Power measurement by two wattmeter method of three phase resistive load & inductive load.

Demonstrate and describe the procedure to install the electrical equipment.

Install & do maintenance of electrical equipment.

Means of assessment-1

Assessing the daily work schedule sheet.

Conducting written test after completion of this component.

Means of assessment-2

Assessing the daily work schedule sheet.

Conducting practical test for all machines mentioned above.

Pass/Fail

Scoring more than 40% in written test and more than 60% in practical test will be declared as competent.

Otherwise, he/she will be declared as not yet competent.

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Title of Component: Hydraulic and pneumatics

Outcome to be assessed	Assessment criteria for the outcome
Demonstrate Pneumatics, Basic controlling equipment and its use.	Make different control circuits by using Pneumatic Control Valves and Components.
Demonstrate Pneumatics, Basic controlling equipment and its use.	Practice and prepare diagram to operate Double Acting Cylinder using 4/2 Direction Control Valve in Pneumatics.
Demonstrate types of Pump , Compressor and its related equipment.	Draw different symbols of different valves and pneumatics components as: Compressor and its related equipment.
Demonstration of Cylinder, valve and its type	Do Actuation of single acting cylinder by 3/2 D.C. valve. Electro Pneumatics.
Demonstrate Electro-Pneumatics, Basic controlling equipment and its use.	Prepare electro-pneumatic control circuit Using solenoid actuated 5/2 DC valves.
Demonstration on Hydraulics, Purpose of fluids and Basic controlling equipment used in hydraulics.	Use Hydraulic Control Valves and various Components and Draw the Circuit diagram to operate Double Acting Cylinder using 4/2 Direction Control Valve in Hydraulics
Demonstrate and mark internal parts of a Power pack and its related equipment.	Do a Sequential Circuit with limited Clamping Pressure. Do a Hydraulic circuit for Rapid traverse and Feed circuit.
Demonstrate about Cylinder, valve and its type.	
Demonstrate Quality requirements of oil.	Do Counter Balance circuit to operate load such that even if the pump is switched off load should not get actuated.
Demonstrate Properties of fluid, Pump and its type.	Do a Hydraulic circuit for Clamping and Drilling operation by Sequence circuit.
Means of assessment-1	
Assessing the daily work schedule sheet.	
Conducting written test after completion of this component.	
Means of assessment-2	
Assessing the daily work schedule sheet.	
Conducting practical test to connect physical field by the means of software.	
Pass/Fail	
Scoring more than 40% in written test and more than 60% in practical test will be declared as competent.	
Otherwise, he/she will be declared as not yet competent.	

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Title of Component: Machine Maintenance

Outcome To Be Assessed	Assessment criteria for the outcome
Demonstrate types and activities of plant maintenance and Documentary report.	Do weekly, quarterly, monthly preventive and breakdown maintenance of lathe, milling and Grinding machine.
Demonstrate about Planning System, spare part Inventory, quality requirement and awareness.	Do Preventive and breakdown maintenance of other conventional Machine.
Demonstrate about maintaining records and documents.	Do Preventive and breakdown maintenance of Compressor and Diesel Generator.
Demonstrate to find Source, part inventory repairing, purchasing and cause and factor analysis for all machines.	Do Preventive and breakdown maintenance of other workshop related machinery equipment
Demonstrate Maintenance of different machine as: turning, milling, and grinding, drilling, radial grinding of different manufacture company.	Do the Procedure for finding Source, part inventory repairing, purchasing and cause and factor analysis for all machines. Do the Maintenance of different machine.
Demonstration on machine codes, panel board and axis homing.	Demonstration on machine codes, panel board and axis homing.
Demonstrate on Objective of CNC machine, machine codes, panel board and axis homing.	Demonstrate on Objective of CNC machine, machine codes, panel board and axis homing.
Demonstrate about different cycle and their use.	Demonstrate about different cycle and their use.
Means of assessment-1 Assessing the daily work schedule sheet. Conducting written test after completion of this component.	
Means of assessment-2 Assessing the daily work schedule sheet. Conducting practical test to operate any machine maintenance.	
Pass/Fail Scoring more than 40% in written test and more than 60% in Practical test will be declared as competent. Otherwise, he/she will be declared as not yet competent.	

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Title of Component: Programmable logic controller

Outcome to be assessed	Assessment criteria for the outcome
Demonstration on industrial Automation, different PLC controllers & their application area.	Identify of PLC Hardware and do Practice to Communicate PLC with system.
Demonstration on LAD, FBD, STL programming language Logic Gates, AND, OR, NAND, NOR, XOR.	Do practice on Installation of PLC software. Do Design and test LAD program using bit & block, Operand.
Demonstration on TIMER, COUNTER, and COMPARATOR blocks, in software.	Do Practice of PLC logic by using timer, counter, comparator, move etc. in the lad/logic.
Demonstration analog and digital signal I/O of PLC.	Do program and test outputs with different signal modules.
Demonstration connection of I/O field devices in signal i/o of plc.	Do the connection of different sensors & actuators with signal modules.
Demonstration connection of remote I/O PLC with server PLC using profibus cable.	Do the connection of different remote I/O with PLC & check the network faults.
Demonstration connection of Ethernet PLC using Profinet system.	Practice to Communicate PLC with Profinet system. Create program for multi-user.
Demonstration of fault monitoring In on line & offline mode of PLC.	Check the indications & LAD for monitoring the faults.
Means of assessment-1 Assessing the daily work schedule sheet. Conducting written test after completion of this component.	
Means of assessment-2 Assessing the daily work schedule sheet. Conducting practical test for PLC communication and Interfacing.	
Pass/Fail Scoring more than 40% in written test and more than 60% in practical test will be declared as competent. Otherwise, he/she will be declared as not yet competent.	

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Title of Component: SCADA & HMI

Outcome to be assessed	Assessment criteria for the outcome
Demonstration on supervisory control and data acquisition system.	Do the installation of SCADA software and driver tools.
Demonstrate about different types of SCADA systems.	Design different Types of SCADA projects.
Demonstrate about graphic designer, tag management, and communication to PLC.	Practice the steps to creating new projects, copy of project, activation & deactivation of project.
Use of Object Properties of Object Palette & Library.	Editing Of Static Properties Style, Flashing, and Display. Use of Standard Color Palette.
Demonstrate about Use of Object Properties of Object Palette & Library.	Practice on mimic logic boards with logics. Create its process picture & simulate using mimic logic boards.
Demonstrate about Integrate & Configure Controls In Process Pictures?	Create process picture of a traffic control, bottle filling, water level control conveyor control & Simulate using simulator.
Demonstrate about Creating an Alarm Logging screen of a process. Archiving Messages. Display Message In Run Time.	Alarm Logging, Principles of Message System, Archiving Messages. Display Message in Run Time, Creating an Online Trend.
Demonstrate about Design PC-Based HMI.	Design PC-Based HMI Interface different field devices with SCADA system & monitoring process values. Configuration of HMI.
Means of assessment-1 Assessing the daily work schedule sheet Conducting written test after completion of this component	
Means of assessment-2 Assessing the daily work schedule sheet. Conducting practical test to communicate PLC and Graphics and PLC Interfacing.	
Pass/Fail Scoring more than 40% in written test and more than 60% in practical test will be declared as competent. Otherwise, he/she will be declared as not yet competent.	

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Title of Component: TIA- Portal

Outcome to be assessed	Assessment criteria for the outcome
Demonstrate about Totally Integrated Automation.	Do the installation of TIA-PORTAL software and driver tools.
Demonstrate types of project create with TIA PORTAL.	Do single user & multiuser project with TIA-Portal.
Demonstrate on hardware of TIA-portal as s7-1200 PLC's.	Identify the hardware module of TIA-Portal and install to mounting rack.
Demonstrate of connection between hard ware module & I/O field devices.	Do the connection of S7-1200 PLC with I/O field devices.
Demonstrate Connection of profibus dp with remote plc.	Do the Connection of profibus dp with remote PLC & HMI.
Demonstrate the Connection of multiple users with multiple PLC using Ethernet communication network (LAN).	Do the Connection of multiple users with multiple PLC using Ethernet communication network (LAN).
Means of assessment-1 Assessing the daily work schedule sheet. Conducting written test after completion of this component.	
Means of assessment-2 Assessing the daily work schedule sheet. Conducting practical test by using modern software.	
Pass/Fail Scoring more than 40% in written test and more than 60% in practical test will be declared as competent. Otherwise, he/she will be declared as not yet competent.	

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Title of Component: AUTO-CAD Electrical

Outcome To Be Assessed	Assessment criteria for the outcome
Demonstration of AUTOCAD & co-ordinate system. Discuss Attribute, scoot and move, Multiple wire bus & edit component	Install AUTOCAD electrical for e-cad design.
Discussion about different types of commands and function keys.	Do practice of 2-d & 3-d drawing in cad software. Modify menu bar & draw menu bar, layer, text & dimensions.
Demonstrate of auto desk electrical workspace awareness, tool bars, tool pallets & insert component working with project manager.	Do the Reverse, flip, dash link components alignment like options in various projects.
Demonstrate of different types of Wire & ladders, trim, parent- child component discussion.	Identify Wire types, wire numbering, source & destination signal & mention it in the cad-design of panels.
Demonstrate of Schematic report & insert plc module.	Create Schematic report & insert plc module
Means of assessment-1 Assessing the daily work schedule sheet Conducting written test after completion of this component.	
Pass/Fail Scoring more than 40% in written test will be declared as competent. Otherwise, he/she will be declared as not yet competent.	

Title of Component: Basic Electronics

Outcome To Be Assessed	Assessment criteria for the outcome
Demonstrate fundamental of electricity, electron theory, atom, molecule, symbol of electronic components.	Identify, sketch & assemble different electronic components, accessories.
Demonstrate diode and its application.	Identify different diodes and draw its output characteristic. Use rectifier to make circuit.
Demonstrate transistor and its biasing	Use transistor to make electronic circuits according to its biasing.

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Demonstrate op-amp and its application	Use op-amp to design various electronic circuits, identify the pins of op-amp IC.
Demonstrate about Soldering technique, active, Passive electronic components, measuring instruments	Identify electronic components by visual appearance, code number and data reference.
Demonstrate the number system, logic gates and K-Map	Know the number system conversion and simplify expressions using K-Map.
Means of assessment-1 Assessing the daily work schedule sheet Conducting written test after completion of this component	
Pass/Fail Scoring more than 40% in written test and more than 60% in practical test will be declared as competent. Otherwise, he/she will be declared as not yet competent.	

Title of Component: Communication Skill

Outcome to be assessed	Assessment criteria for the outcome
Demonstrate Communication Skills, use language as a tool of communication	Understand the Basics of Communication, Soft Skills, non-verbal communication – body language
Demonstrate and improve the participant's English language skills.	Read The Sounds of English – Vowels & Consonant. Word Accent – Accent, Tone, Pitch
Demonstrate Personality Development	Learn Presentation Skills, Newspaper reading, Body Language – positive gestures, handshakes, eye contact, smiles, styles of walking, hand movements, etc. Role Plays and Situation Handling, Personal and Career Development (Career Counseling)
Demonstrate Full Dress Rehearsal	Learn to Present an effective cover letter, resume/curriculum vitae, Group Discussion, Personal Interview, Corporate Interface
Means of assessment-1 Assessing the daily work schedule sheet. Conducting written test after completion of this component.	
Pass/Fail Scoring more than 40% in written test will be declared as competent. Otherwise, he/she will be declared as not yet competent.	

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SECTION 2

Evidence of Level

Title/Name of the qualification/Component: Advanced Diploma in Machine Maintenance & Automation			
			Level-6
NSQF Domain	Outcomes of the Qualification/Component	How the job role relates to the NSQF level descriptors	NSQF Level
Process	Advanced Diploma in Machine Maintenance and Automation qualification identifies and exhibits wide range of well-developed skill set with clear knowledge required to study circuit diagram of Electrical Equipment along with the analyzing the fault of the devices according to standard and non-standard requirements. Also the trainee is expected to be well conversant with the circuit design & implementation automation of the industry.	Job holder is expected to execute the study and analysis process required for various Electrical Equipment, their working principles in various type of load conditions which requires well developed knowledge in study and analysis under different conditions. The trainees also can monitor the condition of electrical devices from a remote location and solve the fault found if any which requires high depth of skill in through this qualification. Hence the qualification is kept at level 6 as per the process is concerned.	6
Professional Knowledge	The curriculum of the qualification Advanced Diploma in Machine Maintenance and Automation covers wide range thorough understanding and knowledge of different type of Electrical Equipment used in Industrial sectors, their working principles, study of various components and sections behaviour in different load conditions and electrical supply input and output etc. along with inclusion of detailed study of Circuit diagram Advanced Diploma in Machine Maintenance and Automation qualification has thorough knowledge of operations of	Job holders needs to have in depth knowledge and understanding circuit design, properties of individual elements/components, site survey, Estimation and costing, Indian Electricity Rules and regulations etc. They also gain adequate knowledge about the automation process of industries through the theoretical input. Therefore this is pegged at level 6.	6

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	<p>various modern measuring and checking equipment and hand tools to support the all these activities.</p>		
Professional Skill	<p>Advanced Diploma in Machine Maintenance and Automation qualification have the ability to apply practical knowledge and understanding in interpreting the circuit diagram of the equipment.</p> <p>Advanced Diploma in Machine Maintenance and Automation also have the ability to perform various operations required for analyzing and organizing the maintenance works systematically. They should have the capability to operate machines to check the functionality of the same after maintenance work</p> <p>Advanced Diploma in Machine Maintenance and Automation imparts detail in depth skill to use different types of instruments to maintain the desired quality and durability.</p>	<p>Job holder is engaged in tasks such as studying, analyzing and interpreting Circuit Drawing, Planning and executing the maintenance work, using appropriate instruments within the quality framework and norms. These activities are variable in nature due to the electricity supply conditions of the locality. They will be accustomed to wide range of machine maintenance for any kind of fault like mechanical, electrical, Electronics etc. These skills are at certain range of cognitive in Hence this is pegged at level 6.</p>	6
Core Skill	<p>Advanced Diploma in Machine Maintenance and Automation curriculum is designed to have reasonable good numerical abilities, mathematical calculations required for analyzing the diagram, communication skills to receive, provide, and transmit information logically to the appropriate person or the group involved in the activities.</p>	<p>The job holder needs to have Generic Skills of writing, Oral and Communication Skills. Job holder prepares Documents for maintenance history and schedule requirements. Understand the maintenance requirements/client requirement which requires reasonably good clarity in oral and the written skills and while working on the content he needs to be aware of the social, political and natural</p>	6

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	<p>Use of appropriate measuring techniques, units and number systems to express degree of accuracy. Should be able to communicate to the appropriate person in regards to health, safety, first aid etc.</p>	<p>environment. Also the job holder is competent enough to prepare the estimation and costing sheet by gathering analytical and logical data for the successful maintenance execution. Therefore it is pegged at level 6.</p>	
Responsibility	<p>Check-up procedures to ensure that maintenance objectives are finished within specified time frames are developed.</p> <p>Checkup procedures to ensure that agreed ethical and legal requirements are met are drawn.</p> <p>Advanced Diploma in Machine Maintenance and Automation is responsible for own work and learning along with full responsibility for other works and learning. The Job holder is expected to have openness to learning, ability to plan and organize own work and identify and solve problems in the course of working with in the team. Understanding the need to take initiative and manage him/herself and others and work to improve efficiency and effectiveness.</p>	<p>Job holder is required to carry out functions such as circuit drawing reading, operating electrical measurement and checking instruments, analyse the problem and find the solution to it within specified requirement. In these activities job holder is doing the tasks independently and guiding others as and when required. He/she is responsible for his/her own learning and others learning during the execution of the task. Therefore it is pegged at level 6</p>	6

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SECTION 3

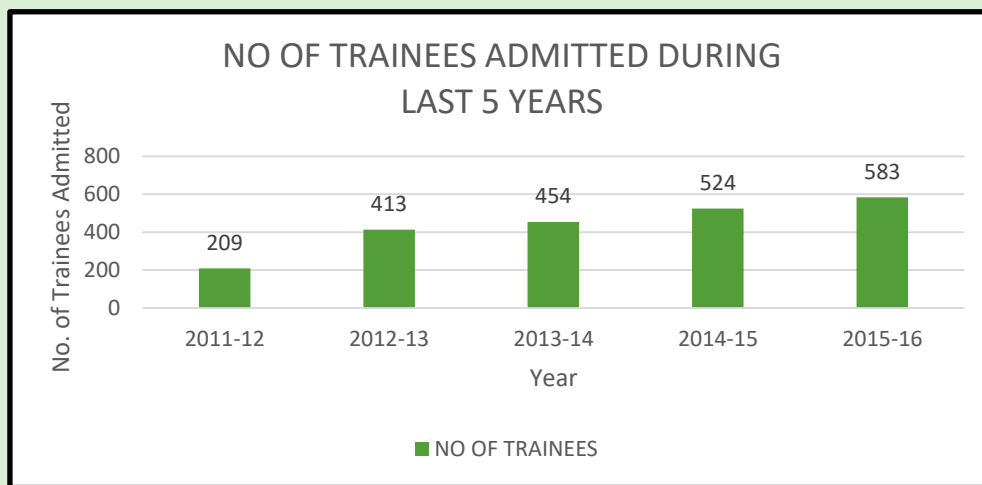
Evidence of Need

What Evidence is there that the Qualification is needed:

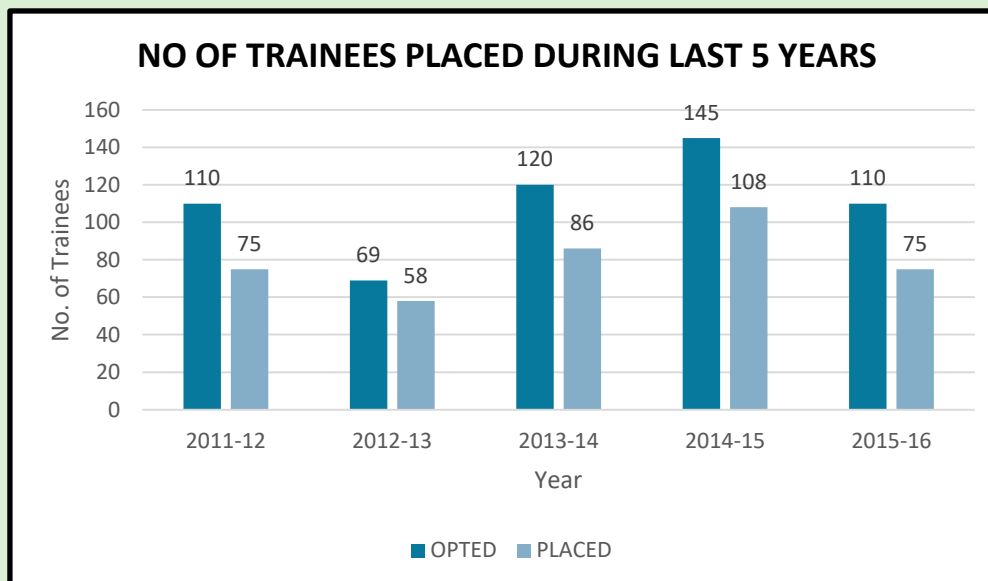
- Decision of the management review meeting.
- Industry Requirements

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

- The estimated uptake of this qualification in the year of **2016-17 is 80.**
- The basis of this estimation is the requirements of the industries and placement of this qualification of last two years.



Trainees Trained/Trainees Opted for Placement/ Trainees placed in last five years.



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

The qualification is originally designed by curriculum committee comprising the training head, industrial expert, academic professional experts.

The work group under the guidance of curriculum development committee already conducted desk search as well as refers the qualification packs for as a supporting document for the mapping of curriculum.

As per the search it is found that, the advanced diploma course is not available for the skill development of the candidates in Advanced Diploma in Machine Maintenance and Automation Course of 6 month duration under the Capital Goods and Automotive Sector Skill Council.

What arrangements are in the 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 curriculum committee meeting for review will be in the month of Jan 2018 which comprising industrial expert, Training Head, Representative from existing employers.
- The data used for revision or update will be impact analysis (student and industries) and new subject area opportunities, multiple entry and exits incorporated or RPL strategy implementations.
- The curriculum review and updates, in consultation with industries and expert of respective domain, NOS approved by NSDA will also be referred to from time to time.

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?

While designing this qualification proper care is taken to linkup with the skill development in the field of Electrical Engineering and other areas.

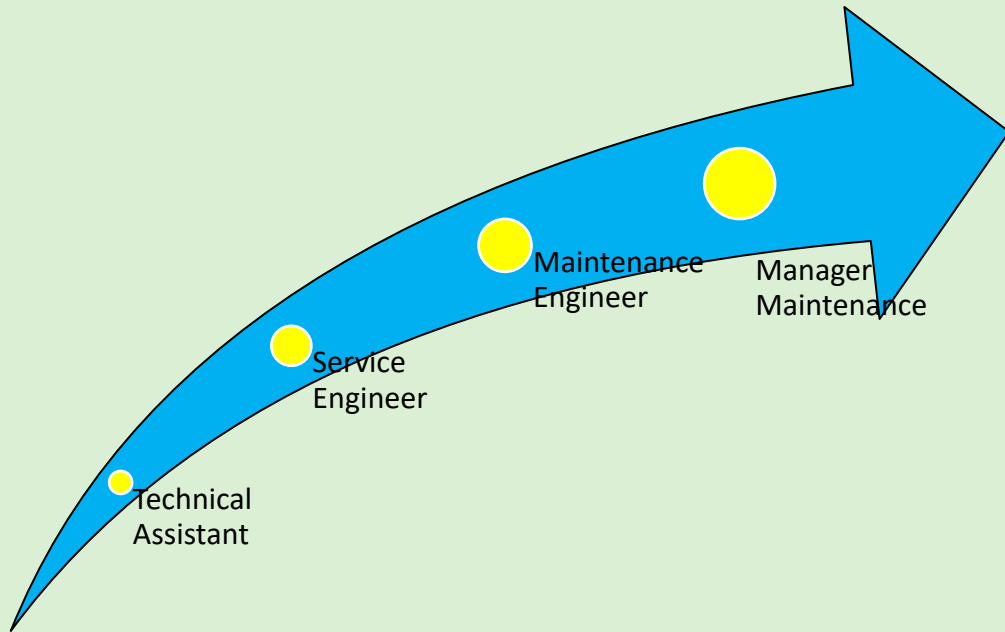
Qualifying trainee will obtain a CTTC, Bhubaneswar Certificate in 'Advanced Diploma in Machine Maintenance And Automation. After 2 year of experience give the opportunities to the trainees to work as Maintenance Engineer as a career progression with this position and experience of 3 years gives career scope of Service Engineer and 5 years' experience leads to Maintenance Supervisor. Also he/she can become an entrepreneur/consultant in this sector after getting 3 year of experience. The below mention diagrams represent the vertical mobility

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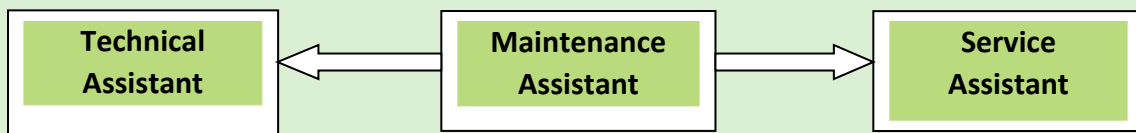
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for the job holder as a job progression in Automobile/Manufacturing Sector.

VERTICAL PROGRESSION



HORIZONTAL PROGRESSION



SOME OF THE RECRUITERS FOR THE ADMMA TRAINEES

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1	GreentIn Solutions Pvt. Ltd, Rajiv Gandhi Infotech Park, Hinjewadi, Pune – 411057
2	Apollo Tyres Ltd,B-25, Sipcot Indl: Growth Centre, Oragadam, Sriperumbudur, Tamil Nadu, India - 602105
3	Kohinoor Technical Institute. Sankar Cinema Road, Near ICICI Bank, Angul.
4	VE Commercial Vehicles Limited (A Volvo Group and Eicher Motors joint venture) 78-86, Industrial Area No. III A. B. Road Dewas - 455001 India
5	Centum Electronics Limited, #44, K.H.B Industrial Area, Yelahanka, Bangalore - 560 106.
6	Innodust Techsolution Pvt. Ltd., Plot No-A/65 , Saheed Nagar, Bhubaneswar, Odisha-751007
7	Planning Academy, Bhubaneswar,L3/122, Acharya Vihar, Bhubaneswar-13
8	Micromatic Machine Tools Pvt. Ltd., No. 240/241, 11th Main, 3rd Phase, Peenya Industrial Area, Bangalore - 560 058
9	Sona BLW Precision Forgings Ltd., T-46, MIDC, Bhosari. Pune - 411026, Maharashtra, INDIA
10	Parle Agro, I/4, Food Processing Park, Khurda Industrial Estate, Khurda. Odisha - 752055
11	ONergy Solar, Plot No-N4/6(Ground Floor), Swapneswar Temple road, IRC village, Nayapalli, Bhubaneswar-751014, (In front of centre of diabetes & endocrinology.)
12	Genius Consultants Ltd, Synthesis Business Park Tower,1C, 1st Floor, CBD/1,Action Area - II, New Town, Kolkata - 700157
13	Veezone Reach ,Plot No. 42, Anand Bhawan, 2nd Floor, Rasulgarh, Bhubaneswar - 751010
14	Fox Solutions , Mallick Commercial Complex,A-69 Kharavela Nagar Bhubaneswar-751001 , India
15	M/s Corrosion Protection Pvt. Ltd, Plot No.103 & 105, Andeisahi, Bhairpur, Jagatpur, Cuttack-754 021, Odisha, India.
16	Forth Right Services,118 Bharati Tower Forest Park, Bhubaneswar, Orissa
17	Corrtech Energy Limited, Hyderabad
18	Pirn Technologies I Level 2 I Oval Building I i-Labs Center I Plot No 18 I Madhapur I Hyderabad I 500 081 I
19	VDEAL SYSTEM, Plot no.754/2, Jaydev Vihar, Near Pabitra Guest House,

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	Bhubaneswar, -751013
20	Group of Engineers services Pvt. Ltd,#418 Manjeera Majestic KPHB Phase I Hyderabad-72