

NSQF QUALIFICATION FILE**Approved in 24th NSQC Dated 27th Feb, 2020****NSDA Code****2020/CCM/DGT/03665****CONTACT DETAILS OF THE BODY SUBMITTING THE QUALIFICATION FILE**

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

Name and address of submitting body:

Directorate General of Training (DGT)
Government of India, Ministry of Skill Development and Entrepreneurship,
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Next to Pusa ITI, Pusa Campus
New Delhi – 110012.

Name and contact details of individual dealing with the submission

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List of documents submitted in support of the Qualifications File**1. Competency-based curriculum with following details:**

Model Curriculum to be added which will include the following:

- a. Indicative list of tools/equipment to conduct the training: Enclosed with curriculum
 - b. Trainers qualification: Indicated in the curriculum
 - c. Lesson Plan: All DGT curricula are designed indicating specific practical to be carried out during training along with details of trade theory. Based on this the concerned instructor prepares the Lesson Plan and demonstration plan with support of IMPs developed by NIMI,DGT.
 - d. Distribution of training duration into theory/practical/OJT component: Indicated in the curriculum.
- 2. Curriculum for Core Skills (Workshop Calculation & Science, Engineering Drawing and Employability Skills).**

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e. SUMMARY

1	Qualification Title	'TURNER'
2	Qualification Code, if any	DGT/1013
3	NCO code and occupation	7223.0601- Turner
4	Nature and purpose of the qualification (Please specify whether qualification is short term or long term)	Prepare skilled Technician to undertake the job roles of Turner and will enable the trainee to make metal articles to required specifications using lathe and cutting tools; study drawings and other specifications of parts to be made etc. It is long term qualification.
5	Body/bodies which will award the qualification	Directorate General of Training (DGT).
6	Body which will accredit providers to offer courses leading to the qualification	Directorate General of Training (DGT) accredits the Training providers (ITIs/ NSTIs/MSTIs/BTCs/BTPs / Industries / Establishments).
7	Whether accreditation/affiliation norms are already in place or not , if applicable (if yes, attach a copy)	Yes. The accreditation/ affiliation norms and any amendments made from time to time are available on DGT web portal.
8	Occupation(s) to which the qualification gives access	<ul style="list-style-type: none"> 7223.0601- Turner
9	Job description of the occupation	The individual will be able to select metal, hold it in chuck, fixture on lathe as required, centre it by manipulating chuck jaws or otherwise using dial indicator or marking block and securely tightens it in position. He/she selects correct cutting tool, grinds it if necessary and holds it tight in tool post at correct height; sets feed and speed and starts machine. Manipulates hand wheels or starts automatic controls to guide cutting tool into or along metal etc.
10	Licensing requirements	NOT REQUIRED
11	Statutory and Regulatory requirement of the relevant	NOT APPLICABLE

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	sector (documentary evidence to be provided)		
12	Level of the qualification in the NSQF	Level 5	
13	Anticipated volume of training/learning required to complete the qualification	Sl. No.	Course Element
		1	Professional Skill (Trade Practical)
		2	Professional Knowledge (Trade Theory)
		3	Workshop Calculation & Science
		4	Engineering Drawing
		5	Employability Skills
			Total
14	Indicative list of training tools required to deliver this qualification	As per Annexure I of curriculum.	
15	Entry requirements and/or recommendations and minimum age	Passed 10th Class with Science and Mathematics.	
		Minimum age 14years as on first day of academic session.	
16	Progression from the qualification (Please show Professional and academic progression)	An Individual can proceed for:	
		Professional <ul style="list-style-type: none"> • Technician • Senior Technician • Supervisor • Manager • Entrepreneur 	Technical / Academic <div style="border: 1px solid black; width: 100px; height: 100px; margin: 10px auto;"></div> ATS CITS Diploma/ Advance Diploma (Vocational)
17	Arrangements for the Recognition of Prior learning (RPL)	<ul style="list-style-type: none"> • Yes (For more details refer "Guidelines for Private candidate" in DGT website MIS portal). 	
18	International comparability where known (research evidence to be provided)	-	

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19	Date of planned review of the qualification.	5 Yrs. from the Date of Approval		
20	Formal structure of the qualification			
	Mandatory components			
	Title of component and identification code/NOSs/ Learning Outcomes	Estimated size (learning hours)		Level
		Skills	Knowledge	
TRADE SPECIFIC				
(i)	Plan and organize the work to make job as per specification applying different types of basic fitting operations & check for dimensional accuracy. [Basic Fitting Operation – Marking, Hack sawing, filing, drilling, taping etc.]	175	49	4
(ii)	Set different shaped jobs on different chuck and demonstrate conventional lathe machine operation observing standard operation practice. [Different chucks: - 3 jaws & 4 jaws, different shaped jobs: - round, hexagonal, square].	50	14	4
(iii)	Prepare different cutting tool to produce jobs to appropriate accuracy by performing different turning operations. [Different cutting tool – V tool, side cutting, parting, thread cutting (both LH & RH), Appropriate accuracy: - $\pm 0.06\text{mm}$, Different turning operation – Plain, facing, drilling, boring (counter & stepped), grooving, Parallel Turning, Step Turning, parting, chamfering, U -cut, Reaming, internal recess, knurling.	250	70	4
(iv)	Test the alignment of lathe by checking different parameters and adjust the tool post. [Different parameters – Axial slip of	25	7	5

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	main spindle, true running of head stock, parallelism of main spindle, alignment of both the centres.]			
(v)	Set different components of machine & parameters to produce taper/ angular components and ensure proper assembly of the components. [Different component of machine: - Form tool, Compound slide, tail stock offset, taper turning attachment. Different machine parameters- Feed, speed, depth of cut.]	75	21	5
(vi)	Set the different machining parameter & tools to prepare job by performing different boring operations. [Different machine parameter- Feed, speed & depth of cut; Different boring operation – Plain, stepped & eccentric]	75	21	5
(vii)	Set the different machining parameters to produce different threaded components applying method/ technique and test for proper assembly of the components. [Different thread: - BSW, Metric, Square, ACME, Buttress.]	250	70	5
(viii)	Set the different machining parameter & lathe accessories to produce components applying techniques and rules and check the accuracy. [Different machining parameters: - Speed, feed & depth of cut; Different lathe accessories: - Driving Plate, Steady rest, dog carrier and different centres.]	50	14	5
(ix)	Plan and perform basic maintenance of lathe & grinding machine and examine their functionality.	50	14	5
(x)	Plan & set the machine parameter to produce precision engineering component to appropriate accuracy by performing different turning operation. [Appropriate accuracy - $\pm 0.02\text{mm}$ / (MT - 3) (proof	125	45	5

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	turning); Different turning operation – Plain turning, taper turning, boring threading, knurling, grooving, chamfering etc.]			
(xi)	Set & Produce components on irregular shaped job using different lathe accessories. [Different Lathe accessories: - Face plate, angle plate].	50	18	5
(xii)	Plan and set the machine using lathe attachment to produce different utility component/ item as per drawing. [Different utility component/ item – Crank shaft (single throw), stub arbour with accessories etc.]	125	45	5
(xiii)	Set the machining parameters and produce & assemble components by performing different boring operations with an appropriate accuracy. [Different boring operation – eccentric boring, stepped boring; appropriate accuracy - $\pm 0.05\text{mm}$]	100	36	5
(xiv)	Calculate to set machine setting to produce different complex threaded component and check for functionality. [Different complex threaded component- Half nut, multi start threads (BSW, Metric & Square)]	125	45	5
(xv)	Set (both job and tool) CNC turn centre and produce components as per drawing by preparing part programme.	250	90	5
(xvi)	Manufacture and assemble components to produce utility items by performing different operations & observing principle of interchangeability and check functionality. [Utility item: - screw jack/ vice spindle/ Box nut, Marking block, drill chuck, collet chuck etc.; different operations: - threading (Square, BSW, ACME, Metric), Thread on taper, different boring (Plain, stepped)]	100	36	5

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(xvii)	Make a process plan to produce components by performing special operations on lathe and check for accuracy. [Accuracy - ± 0.02 mm or proof machining & ± 0.05 mm bore; Special operation – Worm shaft cutting (shaft) boring, threading etc.]	125	45	5
CORE SKILL				
EMPLOYABILITY SKILLS				
(i)	Apply safe working practices.	-	30	5
(ii)	Comply with environment regulation and housekeeping.		30	5
(iii)	Interpret & use formal and technical communication.		30	5
(iv)	Apply the concept in productivity & quality management in day to day work to improve productivity & quality.		30	5
(v)	List and interpret various acts of labour welfare legislation.		30	5
(vi)	Explain energy conservation, global warming and pollution and contribute in day to day work by optimally using available resources.		30	5
(vii)	Explain personnel finance, entrepreneurship and manage/organize related task in day to day work for personal & societal growth.		30	5
(viii)	Utilize computer applications and internet to take benefit of IT developments in the industry.		30	5
WORKSHOP CALCULATION & SCIENCE				
(i)	Demonstrate mathematical concept and principles to perform practical operations.	-	80	5
(ii)	Explain science in the field of study including simple machine.		80	5
ENGINEERING DRAWING				
(i)	Read and apply engineering drawing for different application in the field of work.	-	160	5
	Total		3200	

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

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

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

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

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

(2) Minimum pass marks:

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

Testing and certifications for the course:

Controller of examinations, DGT carries out the assessment and issues National Trade Certificate (NTC) following the norms and guidelines issued by the Directorate from time to time.

Overall assessment strategy:

Assessment of the qualification evaluates trainees to show that they can

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

Specific Arrangements for assessment:

- Assessment is outcome-based.
- There are formative and summative assessments in Theory and Practical.
- Assessment is carried out in Trade theory, Trade Practical, Workshop

Calculation and Science, Engineering Drawing and Employability Skills.

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

Quality assurance activities:

Question papers are set by external paper setters/ software generated.

Evaluation of Theory Examinations in Trade, Workshop Calculation & Science, Engineering Drawing and Employability Skill is done by third-party agency.

Trade Practical is examined by External Examiner.

24. Assessment evidences**Title of Component: Formative Assessment Breakup**

(on half yearly average of the learning assessment covered)

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

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

Pass/Fail

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

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ASSESSMENT CRITERIA:

LEARNING OUTCOME (TRADE SPECIFIC)	
LEARNING OUTCOME	ASSESSMENT CRITERIA
FIRST YEAR	
1. Plan and organize the work to make job as per specification applying different types of basic fitting operations & check for dimensional accuracy following safety precautions. <i>[Basic Fitting Operation – Marking, Hack sawing, filing, drilling, tapping etc.]</i>	Plan & Identify tools, instruments and equipments for marking and make this available for use in a timely manner.
	Select raw material and visual inspect for defects.
	Mark as per specification applying desired mathematical calculation and observing standard procedure.
	Measure all dimensions in accordance with standard specifications and tolerances.
	Identify Hand Tools for different fitting operations and make these available for use in a timely manner.
	Prepare the job for Hacksawing, chiselling, filing, drilling, tapping, grinding.
	Perform basic fitting operations viz., Hacksawing, filing, drilling, tapping and grinding to close tolerance as per specification to make the job.
	Observe safety procedure during above operation as per standard norms and company guidelines.
	Check for dimensional accuracy as per standard procedure.
Avoid waste, ascertain unused materials and components for disposal, store these in an environmentally appropriate manner and prepare for disposal.	
2. Set different shaped jobs on different chuck and demonstrate conventional lathe machine operation observing standard operation practice. <i>[Different chucks: - 3 jaws & 4 jaws, different shaped jobs: - round, hexagonal, square]</i>	Identify and acquaint with lathe machine operation with its components.
	Identify different work holding devices and acquaint with functional application of each device.
	Mount the appropriate work holding device and check for its functional usage to perform turning operations.
	Set the job on chuck as per shape.
	Set the lathe on appropriate speed & feed.
	Operate the lathe to demonstrate lathe operation, observing standard operating practice.
Observe safety procedure during above operation as per standard norms and company guidelines.	
3. Prepare different cutting	Identify cutting tool materials used on lathe machine as per

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<p>tool to produce jobs to appropriate accuracy by performing different turning operations. [Different cutting tool – V tool, side cutting, parting, thread cutting (both LH & RH), Appropriate accuracy: - $\pm 0.06\text{mm}$, Different turning operation – Plain, facing, drilling, boring (counter & stepped), grooving, Parallel Turning, Step Turning, parting, chamfering, U -cut, Reaming, internal recess, knurling.]</p>	the specification and their application.
	Plan and Grind cutting tools
	Measure the tool angles with gauge and Bevel protractor as per tool signature.
	Mount the job and set machine parameter.
	Perform turning operations viz., facing, Parallel Turning, Step Turning, chamfering, grooving, U -cut, parting, drilling, boring (counter & stepped), Reaming, internal recess and knurling to make component as per specification.
	Check accuracy/ correctness of job using appropriate gauge and measuring instruments for their functional requirement.
<p>4. Test the alignment of lathe by checking different parameters and adjust the tool post. [Different parameters – Axial slip of main spindle, true running of head stock, parallelism of main spindle, alignment of both the centres.]</p>	Avoid waste, ascertain unused materials and components for disposal, store these in an environmentally appropriate manner and prepare for disposal.
	Plan for testing alignment of lathe
	Select appropriate items and tools for testing the alignment.
	Demonstrate possible solutions and agree tasks within the team.
	Perform testing of alignment and adjust the tool post as per instruction of machine manual/ standard testing procedure.
	Check for desired functionality.
<p>5. Set different components of machine & parameters to produce taper/ angular components and ensure proper assembly of the components. [Different component of machine: - Form tool, Compound slide, tail stock offset, taperturning attachment. Different machine</p>	Record the different parameters in a standard format.
	Plan and select appropriate method to produce taper/ angular components.
	Evaluate angles to set up the tool and machine component for machining.
	Demonstrate possible solutions and agree tasks within the team.
	Produce taper/ angular components as per standard operating procedure.
	Check accuracy/ correctness of job using appropriate gauge

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<i>parameters- Feed, speed, depth of cut.]</i>	and measuring instruments for their functional requirement.
	Assemble the components to ascertain functionality.
6. Set the different machining parameter & tools to prepare job by performing different boring operations. <i>[Different machine parameter- Feed, speed & depth of cut; Different boring operation – Plain, stepped & eccentric]</i>	Plan for different boring (Plain, stepped & eccentric), Select appropriate tools and counter balance while holding the work piece as per requirement.
	Set the different machining parameters as per requirement.
	Demonstrate possible solutions within the team.
	Set job and produce component following the standard operating procedure.
	Measure with instruments/gauges as per drawing.
	Comply with safety rules when performing the above operations.
	Avoid wastage, ascertain unused materials and components for disposal, store these in an environmentally appropriate manner and prepare for disposal.
7. Set the different machining parameters to produce different threaded components applying method/ technique and test for proper assembly of the components. <i>[Different thread: - BSW, Metric, Square, ACME, Buttress.]</i>	Plan and select appropriate method to produce threaded components.
	Plan and prepare thread cutting tool in compliance to standard thread parameters.
	Produce components as per drawing.
	Check accuracy/ correctness of job using appropriate gauge and measuring instruments for their functional requirement and suit to male /female part.
	Test the proper assembly of the threaded components.
8. Set the different machining parameter & lathe accessories to	Identify different lathe accessories of lathe machine as per functional application.
	Mount appropriate lathe accessories to set up a job for

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produce components applying techniques and rules and check the accuracy. <i>[Different machining parameters: - Speed, feed & depth of cut; Different lathe accessories: - Driving Plate, Steady rest, dog carrier and different centres.]</i>	machining.
	Observe safety/ precaution during mounting the accessories.
	Check for the alignment of accessories to machine as per standard procedure.
	Set the machining parameter and produce the component applying technique/ machine.
	Check the accuracy of the component using instruments.
SECOND YEAR	
9. Plan and perform basic maintenance of lathe & grinding machine and examine their functionality.	Plan for periodic and preventive maintenance of lathe/ grinding machine.
	Select appropriate items and tools for maintenance.
	Demonstrate possible solutions and agree tasks within the team.
	Perform maintenance as per schedule of machine manual.
	Check for desired functionality.
SECOND YEAR	
10. Plan & set the machine parameter to produce precision engineering component to appropriate accuracy by performing different turning operation. <i>[Appropriate accuracy - $\pm 0.02\text{mm}$/ (MT - 3) (proof turning); Different turning operation – Plain turning, taper turning, boring threading, knurling, grooving, chamfering etc.]</i>	Plan and select appropriate method to produce components.
	Grind form cutting tool.
	Set the machine parameters.
	Produce components by performing different turning operations as per standard operating procedure and as per drawing.
	Check accuracy/ correctness of job using appropriate gauge and measuring instruments.
SECOND YEAR	
11. Set & Produce	Plan and select appropriate method to produce irregular

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components on irregular shaped job using different lathe accessories. <i>[Different Lathe accessories: - Face plate, angle plate]</i>	shaped components with internal taper turning.
	Work out different parameters to set up the tool for machining.
	Set the lathe accessories and mount the job.
	Produce components as per standard operating procedure by using appropriate tools.
	Check accuracy/ correctness of job using appropriate gauge and measuring instruments.
12. Plan and set the machine using lathe attachment to produce different utility component/ item as per drawing. <i>[Different utility component/ item – Crank shaft (single throw), stub arbour with accessories etc.]</i>	Select appropriate tools and plan for turning and counter balance while holding the work piece as per requirement.
	Comply with safety rules when performing the above operations.
	Demonstrate possible solutions within the team.
	Set the lathe attachment as per requirement and produce component observing standard operating procedure.
	Measure with instruments/gauges as per drawing.
13. Set the machining parameters and produce & assemble components by performing different boring operations with an appropriate accuracy. <i>[Different boring operation – eccentric boring, stepped boring; appropriate accuracy - $\pm 0.05\text{mm}$]</i>	Plan for different boring (Plain, stepped & eccentric) and counterbalance while holding the work piece as per requirement and select appropriate tools.
	Set the different machining parameters as per requirement.
	Demonstrate possible solutions within the team.
	Set job and produce component following the standard operating procedure.
	Measure with instruments/gauges as per drawing.
	Comply with safety rules when performing the above operations.
	Avoid wastage, ascertain unused materials and components for disposal, store these in an environmentally appropriate

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	manner and prepare for disposal.
14. Calculate to set machine setting to produce different complex threaded component and check for functionality. [Different complex threaded component- Half nut, multi start threads (BSW, Metric & Square)]	Plan and select appropriate method to produce components with multi start threading.
	Prepare appropriate tool for generating required thread form.
	Calculate and set machine
	Mount the job and turn multi start thread (male and female).
	Check accuracy/ correctness of job using appropriate gauge and measuring instruments.
	Match the male & female component for checking for functionality
15. Set (both job and tool) CNC turn centre and produce components as per drawing by preparing part programme.	Plan and prepare part programme as per drawing, simulate for its correctness with appropriate software.
	Prepare tooling layout and select tools as required
	Demonstrate possible solution within the team.
	Set selected tools on to the machine
	Test/Dry run the part programme on the machine
	Set up the job and machine the component as per standard operating procedure involving parallel, step, taper, drilling, boring, radius, grooving and threading operations, etc.
	Check accuracy/ correctness of job using appropriate gauge and measuring instruments.
	Observe safety/ precaution during machining.
	Avoid wastage, ascertain unused materials and components for disposal, store these in an environmentally appropriate manner and prepare for disposal.
16. Manufacture and assemble components to	Plan and select tools and materials for the part components and make this available for use in a timely manner.

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produce utility items by performing different operations & observing principle of interchangeability and check functionality. <i>[Utility item: - screw jack/ vice spindle/ Box nut, Marking block, drill chuck, collet chuck etc.; different operations: - threading (Square, BSW, ACME, Metric), Thread on taper, different boring (Plain, stepped)]</i>	Produce part components as per drawing
	Check for accuracy of all the part components and suitability to the higher assembly.
	Assemble all the part components as per the guide lines given in the drawing.
	Check for functionality of the screw jack, vice spindle/ Box nut, marking block, drill chuck, collet chuck etc., as per standard operating procedure.
	Avoid waste, ascertain unused materials and components for disposal, store these in an environmentally appropriate manner and prepare for disposal.
17. Make a process plan to produce components by performing special operations on lathe and check for accuracy. <i>[Accuracy - $\pm 0.02\text{mm}$ or proof machining & $\pm 0.05\text{mm}$ bore; Special operation – Worm shaft cutting (shaft) boring, threading etc.]</i>	Plan and select appropriate method to produce components with worm gear cutting.
	Prepare appropriate tool for producing required worm shaft.
	Set the job and turn worm shaft, match for accurate fitting with female gauge.
	Check accuracy/ correctness of job using appropriate gauge and measuring instruments.

LEARNING OUTCOME (CORE SKILL)	
LEARNING OUTCOME	ASSESSMENT CRITERIA
EMPLOYABILITY SKILLS	
1. Apply safe working practices	Follow and maintain procedures to achieve a safe working environment in line with occupational health

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	and safety regulations and requirements and according to site policy.
	Recognize and report all unsafe situations according to site policy.
	Identify and take necessary precautions on fire and safety hazards and report according to site policy and procedures.
	Identify, handle and store / dispose of dangerous goods and substances according to site policy and procedures following safety regulations and requirements.
	Identify and observe site policies and procedures in regard to illness or accident.
	Identify safety alarms accurately.
	Report supervisor/ Competent of authority in the event of accident or sickness of any staff and record accident details correctly according to site accident/injury procedures.
	Identify and observe site evacuation procedures according to site policy.
	Identify Personal Protective Equipment (PPE) and use the same as per related working environment.
	Identify basic first aid and use them under different circumstances.
	Identify different fire extinguisher and use the same as per requirement.
2. Comply with environment regulation and housekeeping	Identify environmental pollution & contribute to the avoidance of instances of environmental pollution.
	Deploy environmental protection legislation & regulations
	Take opportunities to use energy and materials in an environmentally friendly manner.
	Avoid waste and dispose waste as per procedure
	Recognize different components of 5S and apply the same in the working environment.
3. Interpret & use formal and technical communication.	Obtain sources of information and recognize information.
	Use and draw up technical drawings and documents.
	Use documents and technical regulations and occupationally related provisions.
	Conduct appropriate and target oriented discussions

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	with higher authority and within the team.
	Present facts and circumstances, possible solutions & use English special terminology.
	Resolve disputes within the team.
	Conduct written communication.
4. Apply the concept in productivity & quality management in day to day work to improve productivity & quality.	Explain the concept of productivity and apply during execution of job.
	Explain the concept of quality tools and apply during execution of job.
5. List and interpret various acts of labour welfare legislation.	Explain basic concept of labour welfare legislation, adhere to responsibilities and remain sensitive towards such laws.
	Knows benefits guaranteed under various acts.
6. Explain energy conservation, global warming and pollution and contribute in day to day work by optimally using available resources.	Explain the concept of energy conservation, global warming, pollution and utilize the available resources optimally & remain sensitive to avoid environment pollution.
	Explain standard procedure for disposal of waste.
7. Explain personnel finance, entrepreneurship and manage/organize related task in day to day work for personal & societal growth.	Explain personnel finance and entrepreneurship.
	Explain role of various schemes and institutes for self-employment i.e. DIC, SIDA, SISI, NSIC, SIDO, Idea for financing/ non-financing support agencies to familiarize with the policies/ programmes, procedure & the available scheme.
	Prepare a report to become an entrepreneur for submission to financial institutions.
8. Utilize computer applications and internet to take benefit of IT developments in the industry.	Explain the basic hardware of personal computer.
	Use common application software viz., word, excel, power point etc., in day to day work.
	Awareness about useful internet websites, search relevant information pertaining to the assigned tasks.
WORKSHOP CALCULATION & SCIENCE	
1. Demonstrate	Solve different problems like phase angle, etc. with the

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mathematical concept and principles to perform practical operations.	help of a calculator.
	Demonstrate conversion of Fraction to Decimal and vice versa.
	Explain BCD code, conversion from decimal to binary and vice-versa, all other conversions.
2. Explain science in the field of study including simple machine.	
2. Explain science in the field of study including simple machine.	Explain concept of basic science related to the field such as Material science, Mass, weight, density, speed, velocity, heat & temperature, force, motion, pressure, heat treatment, centre of gravity, friction.
	Explain levers and its types.
	Explain relationship between Efficiency, velocity ratio and Mechanical Advantage.
	Prepare list of appropriate materials by interpreting detail drawings and determine quantities of such materials.
	Solve simple problems on lifting tackles like crane- Solution of problems with the aid of vectors.
ENGINEERING DRAWING	
1. Read and apply engineering drawing for different application in the field of work.	Read & interpret the information on drawings and apply in executing practical work.
	Read & analyse the specification to ascertain the material requirement, tools and assembly/maintenance parameters.
	Encounter drawings with missing/unspecified key information and make own calculations to fill in missing dimension/parameters to carry out the work.

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SECTION 2

25. EVIDENCE OF LEVEL

OPTION A

Title/Name of qualification/component: TURNER			Level: 5
NSQF Domain	Outcomes of the Qualification/Component	How the outcomes relate to the NSQF level descriptors	NSQF Level
Process	<p>Requires Well Developed Skill, with clear choice of procedures in familiar context</p> <ul style="list-style-type: none"> Plan and organize the work to make job as per specification applying different types of basic fitting operations & check for dimensional accuracy. <i>[Basic Fitting Operation – Marking, Hack sawing, filing, drilling, taping etc.]</i> Test the alignment of lathe by checking different parameters and adjust the tool post. <i>[Different parameters – Axial slip of main spindle, true running of head stock, parallelism of main spindle, alignment of both the centres.]</i> Set different components of machine & parameters to produce taper/ angular components and ensure proper assembly of the components. <i>[Different component</i> 	<p>The learner is expected to perform the work of Turner like “Set different components of machine & parameters to produce taper/ angular components and ensure proper assembly of the components. <i>[Different component of machine: - Form tool, Compound slide, tail stock offset, taper turning attachment. Different machine parameters- Feed, speed, depth of cut.]</i>” and “Test the alignment of lathe by checking different parameters and adjust the tool post. <i>[Different parameters – Axial slip of main spindle, true running of head stock, parallelism of main spindle, alignment of both the centres.]</i>”.</p> <p>The above tasks performed by the learner require demonstrating well developed skill with clear choice of procedures which are familiar in context. In all these tasks the learner has to</p>	5

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Title/Name of qualification/component: TURNER			Level: 5
NSQF Domain	Outcomes of the Qualification/Component	How the outcomes relate to the NSQF level descriptors	NSQF Level
	<p><i>of machine: - Form tool, Compound slide, tail stock offset, taper turning attachment. Different machine parameters- Feed, speed, depth of cut.]</i></p>	<p>apply one's knowledge and decide what needs to be done to meet the client's requirement and decide how to rectify it or plan as per the layout and conditions available.</p> <p>Hence NSQF Level is 5 for this descriptor.</p>	
Professional knowledge	<p>Knowledge of facts in the field of work or study</p> <ul style="list-style-type: none"> • Lathe cutting tool-different types, shapes and different angles. <p>Knowledge of Principles and general concepts in the field of work or study</p> <ul style="list-style-type: none"> • Drills-different parts, types, size etc., different cutting angles, cutting speed for different material. Boring tool. Counter - sinking and Counter boring. Letter and number drill, core drill etc. <p>Knowledge of processes in the field of work or study</p> <ul style="list-style-type: none"> • CNC technology basics: Difference between CNC and conventional lathes. Advantages and disadvantages of CNC 	<p>The learner is expected to possess and demonstrate the knowledge of different types, shapes and angles of Lathe Cutting Tools. He/she should know about the different types, sizes of drills, boring tool, counter-sinking and counter boring process etc. The learner is expected to know about the basics of CNC technology, advantages and disadvantages of CNC machines over conventional machines etc.</p> <p>The above knowledge expected to be possessed by the learner are the knowledge of facts, principles, processes and general concepts required in this field of work or study.</p> <p>Hence NSQF Level is 5 for this descriptor.</p>	5

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Title/Name of qualification/component: TURNER			Level: 5
NSQF Domain	Outcomes of the Qualification/Component	How the outcomes relate to the NSQF level descriptors	NSQF Level
	machines over conventional machines.		
Professional skill	<ul style="list-style-type: none"> Plan and perform basic maintenance of lathe & grinding machine and examine their functionality. Set & Produce components on irregular shaped job using different lathe accessories. [Different Lathe accessories: - Face plate, angle plate]. Calculate to set machine setting to produce different complex threaded component and check for functionality. [Different complex threaded component- Half nut, multi start threads (BSW, Metric & Square)]. 	<p>The learner is expected to plan and perform basic maintenance of lathe & grinding machine, set and produce components using different lathe accessories, perform calculation to set machine setting to produce various complex threaded components. The above tasks performed by the learner require a range of cognitive and practical skills to accomplish tasks which also involves estimating bill of materials and cost required for the job or planning as per requirement. Detect fault and decide the course of action. All these actions involve planning and solving problems by selecting and applying basic methods, tools, materials and information.</p> <p>Hence NSQF Level is 5 for this descriptor.</p>	5
Core skill	<p>Desired Mathematical Skills</p> <ul style="list-style-type: none"> Explain science in the field of study including simple machine. 	<p>The learning outcomes for example 'Explain personnel finance, entrepreneurship and manage/organize related task in day to day work for personal & societal growth ' and 'Interpret &</p>	5

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Title/Name of qualification/component: TURNER			Level: 5
NSQF Domain	Outcomes of the Qualification/Component	How the outcomes relate to the NSQF level descriptors	NSQF Level
	<p>Understanding of social/political</p> <ul style="list-style-type: none"> Explain personnel finance, entrepreneurship and manage/organize related task in day to day work for personal & societal growth. <p>Organizing information and communication</p> <ul style="list-style-type: none"> Interpret & use formal and technical communication. 	<p>use formal and technical communication' are the learning outcomes where the learner needs to display desired mathematical skill; understanding of social, political; and some skill of collecting and organizing information, communication.</p> <p>Hence NSQF Level is 5 for this descriptor.</p>	
Responsibility	<ul style="list-style-type: none"> Plan and set the machine using lathe attachment to produce different utility component/ item as per drawing. [Different utility component/ item – Crank shaft (single throw), stub arbour with accessories etc. Make a process plan to produce components by performing special operations on lathe and check for accuracy. [Accuracy - $\pm 0.02\text{mm}$ or proof machining & $\pm 0.05\text{mm}$ bore; Special operation – Worm shaft cutting (shaft) 	<p>The role of Turner is independently responsible to perform the work as per specifications and their own analysis of what needs to be done based on their understanding of fitting processes, principles and standards to achieve desired outcome. Here the learner takes responsibility for own work and learning and some responsibility of other's works and learning.</p> <p>Hence NSQF Level is 5 for this descriptor.</p>	5

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Title/Name of qualification/component: TURNER			Level: 5
NSQF Domain	Outcomes of the Qualification/Component	How the outcomes relate to the NSQF level descriptors	NSQF Level
	boring, threading etc.] • Set (both job and tool) CNC turn centre and produce components as per drawing by preparing part programme.		

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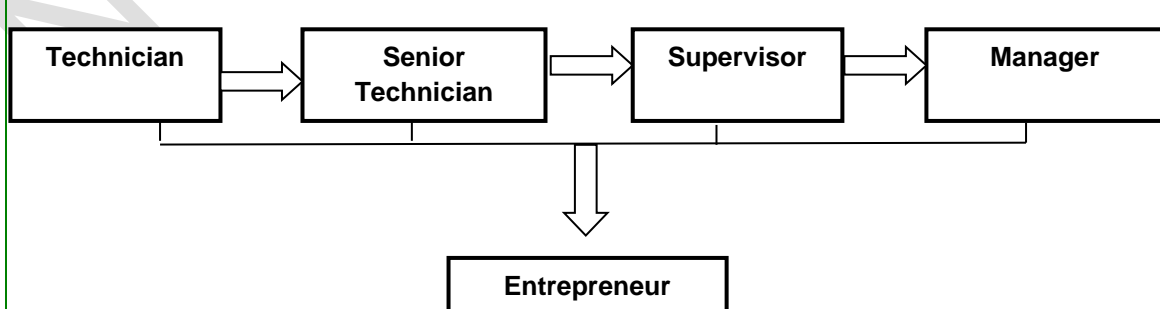
NSQF QUALIFICATION FILEApproved in 24th NSQC Dated 27th Feb, 2020**SECTION 3****EVIDENCE OF NEED**

26	<p>What evidence is there that the qualification is needed? What is the estimated uptake of this qualification and what is the basis of this estimate?</p> <table border="1" data-bbox="339 517 1390 1666"> <thead> <tr> <th data-bbox="339 517 627 663">Basis</th> <th data-bbox="627 517 1390 663">In case of other Awarding Bodies (Institutes under Central Ministries and states departments)</th> </tr> </thead> <tbody> <tr> <td data-bbox="339 663 627 1043">Need of the qualification</td> <td data-bbox="627 663 1390 1043">Capital Goods And Manufacturing Sector has a significant presence of organized as well as unorganized skilled manpower requirement. This sector is poised to grow exponentially in the years to come and is highly labor intensive and there are many emerging trends in this sector. Hence the qualification has been designed keeping in view to cater to the ever-increasing demand of skilled manpower in consultation with stakeholders.</td> </tr> <tr> <td data-bbox="339 1043 627 1464">Industry Relevance</td> <td data-bbox="627 1043 1390 1464">The job role defined for the qualification is as per the National Classification of Occupations 2015 which is developed by Employment Directorate under the ministry of Labour and Employment in collaboration with different industry partners and as per ILO guidelines. Moreover, the training is imparted in ITIs/NSTIs/MSTIs/BTC/ BTPs/ Industries / Establishments etc. where such requirement is available. This justifies the qualification is very much relevant for industry.</td> </tr> <tr> <td data-bbox="339 1464 627 1592">Usage of the qualification</td> <td data-bbox="627 1464 1390 1592">The Proposed qualification will create skilled Technician for various establishments in different Sectors.</td> </tr> <tr> <td data-bbox="339 1592 627 1666">Estimated uptake</td> <td data-bbox="627 1592 1390 1666">The present seating capacity is 37824.</td> </tr> </tbody> </table>	Basis	In case of other Awarding Bodies (Institutes under Central Ministries and states departments)	Need of the qualification	Capital Goods And Manufacturing Sector has a significant presence of organized as well as unorganized skilled manpower requirement. This sector is poised to grow exponentially in the years to come and is highly labor intensive and there are many emerging trends in this sector. Hence the qualification has been designed keeping in view to cater to the ever-increasing demand of skilled manpower in consultation with stakeholders.	Industry Relevance	The job role defined for the qualification is as per the National Classification of Occupations 2015 which is developed by Employment Directorate under the ministry of Labour and Employment in collaboration with different industry partners and as per ILO guidelines. Moreover, the training is imparted in ITIs/NSTIs/MSTIs/BTC/ BTPs/ Industries / Establishments etc. where such requirement is available. This justifies the qualification is very much relevant for industry.	Usage of the qualification	The Proposed qualification will create skilled Technician for various establishments in different Sectors.	Estimated uptake	The present seating capacity is 37824.
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Usage of the qualification	The Proposed qualification will create skilled Technician for various establishments in different Sectors.										
Estimated uptake	The present seating capacity is 37824.										
27	<p>Recommendation from the concerned Line Ministry of the Government/Regulatory Body. To be supported by documentary evidences.</p> <p>The qualification originally designed for Craftsman Training Scheme is in existence for many years and approved by DGT (Regulatory Body) under Ministry of Skill Development and Entrepreneurship, Govt. of India.</p>										

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

SECTION 4**EVIDENCE OF PROGRESSION**

30	<p>What steps have been taken in the design of this or other qualifications to ensure that there is a clear path to other qualifications in this sector? Show the career map here to reflect the clear progression</p> <p>On completion of the training the trainee will have an opportunity to move in vertical/horizontal pathways to promote to higher designations. The learner can further undergo other specialised courses to excel in the relevant field.</p>  <pre> graph LR A[Technician] --> B[Senior Technician] B --> C[Supervisor] C --> D[Manager] B --> E[Entrepreneur] </pre>
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