JOB SPECIFICATION
AND
SKILL TEST

JOB TITTLE : LATHE SETTER OPERATOR, L – 3
SECTOR : MECHANICAL
SUB-SECTOR : METAL MACHINING

Council for Technical Education and Vocational Training
NATIONAL SKILL TESTING BOARD
Madhyapur thimi – 17, Sanothomi, Bhaktapur, Nepal
May 2006

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1989

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Recommended by Mechanical Technical Sub Committee.

May, 2006

JOB SPECIFICATION	
1	**JOB TITLE : LATHE SETTER OPERATOR** **LEVEL : 3**
2	**JOB DESCRIPTION** Prepares the machine for operation, operates lathe machine to performs knurling, turning tapers, turning profiles, cutting multi start threads, turning bearing journals, turning eccentric and determines the estimating and costing of the product.
3	**LIST OF TASKS** 1. Turning tapers (External and internal). 2. Turning profiles (External and internal). 3. Cutting multi start threads (V and profile). 4. Turning bearing journals (External and internal). 5. Turning eccentric.
4	**QUALIFYING NOTES (entry requirements, etc.)** - Normal health. - Educational requirements: able to read, write and understands specifications and makes necessary calculations.

	TASK SPECIFICATION
5	**TASK NO. :** 1 **TURNING TAPERS (External and Internal)** **JOB TITLE:** LATHE SETTER OPERATOR, L - 3
6	**TASK ELEMENTS** 1.1 Ascertains job requirements from drawing/instruction or other specifications. 1.2 Wear safety clothing (cloth, goggle, shoes). 1.3 Selects appropriate materials. 1.4 Determines sequences and methods as required by specifications. 1.5 Selects and clamps appropriate cutting tools. 1.6 Positions and secures work piece on machine and sets machine components. 1.7 Sets machine controls as required (speed, feed and depth of cut). 1.8 Ensures coolant supply. 1.9 Operates automatic or manual controls. 1.10 Performs taper turning. 1.11 Checks accuracy of job using measuring instruments and gauges. 1.12 Repositions work piece, if necessary. 1.13 Changes tools and resets machine, if necessary. 1.14 Follows safety rules.

TASK SPECIFICATION	
7	**TASK PERFORMANCE REQUIREMENTS** **Drawing/instruction:-** Working drawing and metal table book. **Machine tools & accessories:-** Lathe machine, bench/pedestal grinding machine, center drill, drill chuck with key, revolving center and lathe dog face plate, dog carrier etc. **Measuring instruments and gauges:-** Vernier caliper, micrometer (inside and outside), bevel protractor, dial test indicator, telescopic gauge and taper plug gauge (outside/inside). **Fitting tools:-** Spanner set, hammer and mallets. **Cutting tools:-** Turning tools external – rough/facing/turning/form turning and turning tools internal – boring/form turning. **Consumable materials:-** Coolant, lubricants and metals as specified in drawing.
8	**TASK PERFORMANCE STANDARDS** Dressed in appropriate safety clothing, materials selected as specified, appropriate tools selected and clamped securely, work piece secured and aligned to allow taper turning operation. appropriate speed, feed and depth of cut selected, coolant supplied adequately to prevent overheating of work piece and cutting tools, controls operated automatically or manually without tool breakage or damage to work piece, used tools and instruments cleaned and returned to specified place and machine and surrounding cleaned. Turned tapers within tolerances as specified below:- Linear ± 0.01mm. Angular ± 30 minutes. Surface finish 0.8 microns.

9	10	**TASK TRAINING DATA**			
TASK No.	T. E. No.	TECHNICAL KNOWLEDGE	APPLIED CALCULATION	GRAPHIC INFORMATION	SAFETY AND HYGINE
1	1	Knowledge of use and care of measuring instruments such as inside and outside calipers, micrometer and limit taper plug gauge.	Interpretation and computation of imperial and metric units for linier and angular measurement.	Interpretation of conventional symbols and working drawing for taper turning.	Importance of using emergency stop.
	2	Knowledge of types of tapers and their applications. Methods of taper turning on lathe machine.	Calculation to determine the amount of tail stock offset or compound slide swivel for specified taper.		
	3	Knowledge of sequential operation involved in producing work piece.			
	4	Knowledge of turning tools and methods of aligning and clamping.	Interpretation of the metal table book provided to calculate the required tapered angle to be set.		
	5	Knowledge of procedure for securely clamping work piece in different work holding devices.			
	6	Knowledge of factors affecting surface finish & quality of job.			
	7	Knowledge of types and properties of coolants.			
	8	Knowledge of manual and automatic controls.			

TASK PERFORMANCE TEST (skill assessment)			
11	TASK TITLE : **TURNING TAPERS (External and Internal)** TASK No. : 1	LOCATION OF TEST: CANDIDATE'S NAME: EVALUATOR'S NAME:	
12	TEST FACTORS AND ITEMS	STANDARD MET	STANDARD NOT MET (comments)
	DID THE CANDIDATE? 1.1 Wear safety clothing. 1.2 Selects appropriate measuring instruments. 1.3 Select the specified material. 1.4 Select, align and clamp the appropriate tools securely. 1.5 Tighten and align the work piece to allow taper tuning operations. 1.6 Select and set the appropriate speed, feed and depth of cut. 1.7 Supply adequate coolants. 1.8 Select and manipulate appropriate controls. 1.9 Reposition the work piece, if necessary. 1.10 Change the tools as required to complete taper turning operations. 1.11 Produce the work piece within tolerances as specified below:- Linear ± 0.01mm. Angular ± 30 minutes. Surface finish 0.8 microns. 1.12 Produce the work piece within specified time. 1.13 Clean used tools, measuring instruments and return to specified place. 1.14 Clean machine and surrounding. 1.15 Follow safety rules.		

TASK SPECIFICATION	
5	**TASK NO. :** 2 **TURNING PROFILES (EXTERNAL AND INTERNAL)** **JOB TITLE:** LATHE SETTER OPERATOR, L - 3
6	**TASK ELEMENTS** 2.1 Ascertains job requirements from drawing instruction and/or other specifications. 2.2 Wears safety clothing. 2.3 Selects appropriate materials. 2.4 Selects form tools, marking tools and measuring instruments/gauges. 2.5 Grinds and re-sharpens form tools, if necessary. 2.6 Determines sequence and methods as required by specifications. 2.7 Aligns and clamps the tool. 2.8 Positions and secures work piece on machine. 2.9 Sets machine controls as required (speed, feed, depth of cut). 2.10 Ensures coolant supply. 2.11 Performs profile turning. 2.12 Checks accuracy of job using measuring instruments and gauges. 2.13 Repositions work piece, if necessary. 2.14 Changes tools and resets machine, if necessary. 2.15 Follows safety rules.

TASK SPECIFICATION	
7	**TASK PERFORMANCE REQUIREMENTS** **Drawing/instruction:-** Working drawing and metal table book. **Machine tools & accessories:-** Lathe machine, revolving center, center drill and drill chuck with chuck key. **Measuring instruments and gauges:-** Caliper – external and internal, vernier caliper, micrometer (inside and outside), dial test indicator, slip gauge set, filler gauge, radius gauge – external and internal. **Fitting tools:-** Hammer and mallets. **Cutting tools:-** Grooving and profiles tools . **Consumable materials:-** Coolant, lubricants and metals as specified in drawing.
8	**TASK PERFORMANCE STANDARDS** Dress in appropriate safety clothing, materials selected as specified, appropriate grooving and profile tools selected and clamped securely as required, work piece securely tightened and aligned to allow turning profiles operation, appropriate speed, feed and depth of cut selected and set as specified, coolant supplied adequately to prevent overheating of work piece and grooving or profile tools. Controls operated automatically or manually without tool breakage or damage to work piece, used tools and instruments cleaned and returned to specified place, machine and surrounding cleaned. profiles turned within tolerances as specified below:- Linear ± 0.01mm. Angular ± 30 minutes. Surface finish 0.8 microns.

9	10	**TASK TRAINING DATA**			
TASK No.	T. E. No.	TECHNICAL KNOWLEDGE	APPLIED CALCULATION	GRAPHIC INFORMATION	SAFETY AND HYGINE
2	1	Knowledge of use and care of measuring instruments such as inside and outside calipers, micrometers and gauges etc.	Interpretation and computation of units for linear measurement.	Interpretation of conventional symbols and working drawing for turning profiles.	Importance of using emergency stop.
	2	Knowledge of different run-out of thread, groove and profile turning operation in lathe machine.			
	3	Knowledge of sequential operation involved in producing work piece.			
	4	Knowledge of groove and profile turning tools and methods of aligning and clamping tools.			
	5	Knowledge of procedure for securing work piece in different work holding devices.			
	6	Knowledge of factors affecting surface & quality of job.			
	7	Knowledge of types of properties of coolants.			
	8	Knowledge of manual and automatic controls.			

TASK PERFORMANCE TEST (skill assessment)			
11	TASK TITLE : **TURNING PROFILES (EXTERNAL & INTERNAL)** TASK No. : 2	LOCATION OF TEST: CANDIDATE'S NAME: EVALUATOR'S NAME:	
12	TEST FACTORS AND ITEMS	STANDARD MET	STANDARD NOT MET (comments)
	DID THE CANDIDATE? 2.1 Wear safety clothing. 2.2 Select the specified material. 2.3 Select measuring instruments/gauges. 2.4 Select, align and clamp the appropriate profile tool as specified. 2.5 Tighten and align the work piece to allow profile tuning operations. 2.6 Select and set the appropriate speed, feed and depth of cut. 2.7 Supply adequate coolants. 2.8 Select and manipulate appropriate controls. 2.9 Reposition the work piece, if necessary. 2.10 Change the tools as required to complete profile turning operations. 2.11 Produce the work piece within tolerances as specified below:- Linear ± 0.01mm. Angular ± 30 minutes. Surface finish 0.8 microns. 2.12 Produce the work piece within specified time. 2.13 Clean used tools, instruments, machine and working area. 2.14 Follow safety rules.		

	TASK SPECIFICATION
5	**TASK NO. :** 3 **CUTTING MULTI START THREADS (V and PROFILE)** **JOB TITLE:** LATHE SETTER OPERATOR, L - 3
6	**TASK ELEMENTS** 3.1 Ascertains job requirements from drawing and/or other specifications. 3.2 Wears safety clothing. 3.3 Selects appropriate materials. 3.4 Selects marking and measuring tools. 3.5 Determines sequences and methods as required by specification. 3.6 Selects, sharpens and clamps appropriate cutting tools. 3.7 Positions and secures work piece on machine. 3.8 Sets machine controls as required (speed, feed and depth of cut). 3.9 Sets lead screw position. 3.10 Ensures coolant supply. 3.11 Cuts multi start threads. 3.12 Checks accuracy of job using measuring instruments and gauges. 3.13 Repositions work piece, if necessary. 3.14 Changes tools and resets machine, if necessary. 3.15 Follows safety rules.

TASK SPECIFICATION	
7	**TASK PERFORMANCE REQUIREMENTS** **Drawing/instruction:-** Working drawing and metal table book. **Machine tools & accessories:-** Lathe machine, revolving center, center drill and drill chuck with key. **Measuring instruments and gauges:-** Vernier caliper, micrometer, dial test indicator, telescope gauge, thread gauges and pitch gauges. **Fitting tools:-** Spanner set, keys, hammer and mallets. **Cutting tools:-** Thread cutting tools. **Consumable materials:-** Coolant, lubricants and metals as specified in drawing.
8	**TASK PERFORMANCE STANDARDS** Dressed in appropriate safety clothing, materials selected as specified, appropriate tools and measuring instruments selected, ground and clamped securely, work piece securely tightened and aligned to allow multi start thread (v and profile) cutting operation. Speed feed and depth of cut selected and set, coolant supplied adequately to prevent overheating of work piece and thread cutting tools. Controls operated automatically or manually without tool breakage or damage to work piece, used tools and instruments cleaned and returned to specified place, machine and surrounding cleaned. Multi start threads (v and profile) cut within tolerances as specified below:- Linear ± 0.01mm. Angular ± 30 minutes. Surface finish 0.8 microns.

9	10	**TASK TRAINING DATA**			
TASK No.	T. E. No.	TECHNICAL KNOWLEDGE	APPLIED CALCULATION	GRAPHIC INFORMATION	SAFETY AND HYGINE
3	1	Knowledge of use and care of measuring instruments such as micrometer, pitch gauge and thread gauge.	Reading and interpretation of units for linear & angular measurement.	Interpretation of nomenclature of multi start threads (v and profile).	Importance of using emergency stop.
	2	Knowledge of principles of multi start threads (v and profile) cutting by single point cutting tools in lathe machine.			
	3	Knowledge of sequential operation involved in producing work piece.			
	4	Knowledge of multi start threads (v and profile) cutting operation on lathe machine.			
	5	Knowledge of procedure for securely clamping work piece in different work holding devices.			
	6	Knowledge of the factors affecting surface finish & quality of the job.			
	7	Knowledge of generating multi start threads.	Calculation regarding selection & setting of gear trains.		
	8	Knowledge of types and properties of coolants.			
	9	Knowledge of manual and automatic controls.			

TASK PERFORMANCE TEST (skill assessment)			
11	TASK TITLE :**CUTTING MULTI START THREADS (V & PROFILE)** TASK No. : 3	LOCATION OF TEST: CANDIDATE'S NAME: EVALUATOR'S NAME:	
12	TEST FACTORS AND ITEMS	STANDARD MET	STANDARD NOT MET (comments)
	DID THE CANDIDATE? 3.1 Wear safety clothing. 3.2 Select, align, grind and clamp the appropriate tool. 3.3 Select appropriate materials and measuring instruments. 3.4 Tighten and align the work piece to allow multi start thread (v and profile) cutting operations. 3.5 Select and set the appropriate speed, feed and depth of cut. 3.6 Supply adequate coolants. 3.7 Select and manipulate appropriate controls. 3.8 Reposition the work piece, if necessary. 3.9 Change the tools as required to complete multi start thread (v and profile) cutting operations. 3.10 Produce the work piece within tolerances as specified below:- Linear ± 0.01mm. Angular ± 30 minutes. Surface finish 0.8 microns. 3.11 Produce the work piece within specified time. 3.12 Clean used tools, measuring instruments and return to specified place. 3.13 Follow safety rules.		

TASK SPECIFICATION	
5	**TASK NO. :** 4 **TURNING BEARING JOURNALS (EXTERNAL & INTERNAL)** **JOB TITLE:** LATHE SETTER OPERATOR, L - 3
6	**TASK ELEMENTS** 4.1 Ascertains job requirements from drawing, instructions and/or other specifications. 4.2 Wears safety clothing. 4.3 Selects appropriate materials. 4.4 Selects measuring instruments. 4.5 Determines sequences and methods as required by specification. 4.6 Selects and clamps appropriate cutting tools. 4.7 Positions and secures work piece on machine. 4.8 Sets machine controls as required (Speed, feed, and depth of cut). 4.9 Ensures coolant supply. 4.10 Performs turning bearing journals. 4.11 Checks accuracy of job using measuring instruments and gauges. 4.12 Repositions work piece, if necessary. 4.13 Changes tools and resets machine, if necessary. 4.14 Follows safety rules.

TASK SPECIFICATION	
7	**TASK PERFORMANCE REQUIREMENTS** **Drawing/instruction:-** Working drawing and metal table book. **Machine tools & accessories:-** Lathe machine, revolving center, dead and half center, center drill and drill chuck with key. **Measuring instruments and gauges:-** Vernier caliper, micrometer (inside and outside), dial test indicator and telescope gauge. **Fitting tools:-** Spanner set, hammer and mallets. **Cutting tools:-** Cutting tools (roughing and finishing). **Consumable materials:-** Coolant, lubricants and metals as specified in drawing.
8	**TASK PERFORMANCE STANDARDS** Dressed in appropriate safety clothing, materials selected as specified, appropriate tools and measuring instruments selected for turning bearing journals operations, speed, feed and depth of cut selected appropriate to material and size of work piece, controls operated either automatically/manually without tool breakage or damage to work piece, adequate coolant supplied to prevent overheating of work piece, work piece repositioned, tools changed and machine reset as required, used tools and instruments cleaned and return to specified place, machine and surrounding cleaned. Bearing journals turned within tolerances as specified below:- Linear ± 0.01mm. Angular ± 30 minutes. Surface finish 0.8 microns.

9	10	**TASK TRAINING DATA**			
TASK No.	T. E. No.	TECHNICAL KNOWLEDGE	APPLIED CALCULATION	GRAPHIC INFORMATION	SAFETY AND HYGINE
4	1	Knowledge of use and care of measuring instruments such as inside and outside calipers, micrometer and telescopic gauge.	Reading metric and imperial system of units for linear measurement.	The reading & interpretation of working drawing to determine, dimensions of required materials, working sequence, and degree of accuracy.	Importance of using emergency stop.
	2	Knowledge of operation on bearing materials.			
	3	Knowledge of sequential operations involved in producing work piece.			
	4	Knowledge of inserting procedures & securing work piece in different work holding device.			
	5	Knowledge of the factors affecting surface finish and quality of the job.			
	6	Knowledge of shoulders and surface finishing.			
	7	Knowledge of types and properties of coolants.			
	8	Knowledge of manual and automatic controls.			

TASK PERFORMANCE TEST (Skill Assessment)			
11	TASK TITLE : **TURNING BEARING JOURNALS (EXTERNAL & INTERNAL)** TASK No. : 4	LOCATION OF TEST: CANDIDATE'S NAME: EVALUATOR'S NAME:	
12	TEST FACTORS AND ITEMS	STANDARD MET	STANDARD NOT MET (comments)
	DID THE CANDIDATE? 4.1 Wear appropriate safety clothing. 4.2 Select materials as specified according to the working drawing. 4.3 Select appropriate measuring instruments. 4.4 Select appropriate tools and clamp in position securely. 4.5 Tighten and align work piece securely to allow turning bearing journals. 4.6 Select appropriate speed, feed and depth of cut corresponding to materials and size. 4.7 Maintain adequate supply of coolant to prevent overheating of cutting tools and work piece. 4.8 Operate the controls without tool breakage or damage to work piece. 4.9 Produce the work piece within tolerances as specified below:- Linear ± 0.01mm. Angular ± 30 minutes. Surface finish 0.8 microns. 4.10 Choose the most appropriate sequence of machining operation 4.11 Change tools, speed and feed, if necessary. 4.12 Follow safety rules.		

	TASK SPECIFICATION
5	**TASK NO.** : 5 **TURNING ECCENTRIC** **JOB TITLE:** LATHE SETTER OPERATOR, L-3
6	**TASK ELEMENTS** 5.1 Ascertains job requirements from drawing and/or other specifications. 5.2 Wears safety clothing. 5.3 Selects appropriate materials. 5.4 Determines sequence and method as required by specifications. 5.5 Selects, sharpens and clamps appropriate cutting tools. 5.6 Positions and secures work piece on machine as per the off-set required. 5.7 Sets machine controls as required (speed, feed and depth of cut). 5.8 Ensures coolant supply. 5.9 Performs eccentric turning. 5.10 Checks accuracy of job using measuring instruments and gauges. 5.11 Repositions work piece, if necessary. 5.12 Changes tools and resets machine as necessary. 5.13 Follows safety rules.

TASK SPECIFICATION	
7	**TASK PERFORMANCE REQUIREMENTS** **Drawing/instruction:-** Working drawing and metal table book. **Machine tools & accessories:-** Lathe machine, drill machine, revolving center, dead and half center, lathe dog, dog carrier, face plate, four jaw chuck, center drill and drill chuck with key. **Measuring instruments and gauges:-** Marking gauge and surface plate, v-block with bridge and angle plate, try square, vernier caliper, micrometer, dial test indicator and vernier height gauge. **Fitting tools:-** Spanner set, hammer, mallets and center punch. **Cutting tools:-** Cutting tools (roughing, finishing and grooving). **Consumable materials:-** Coolant, lubricants and metals as specified in drawing.
8	**TASK PERFORMANCE STANDARDS** Dressed in appropriate safety clothing, materials selected as specified, appropriate tools selected, ground and clamped securely, work piece securely tightened and aligned to allow eccentric turning operation, speed, feed and depth of cut selected and set, coolant supplied adequately to prevent overheating of work piece and cutting tools, controls operated automatically or manually without tool breakage or damage to work piece, work piece repositioned, tools changed and machine reset, used tools and instruments cleaned and return to specified place, machine and surrounding cleaned. Eccentric turned within tolerances as specified below:- Linear ± 0.01mm. Angular ± 30 minutes. Surface finish 0.8 microns.

9	10	**TASK TRAINING DATA**			
TASK No.	T. E. No.	TECHNICAL KNOWLEDGE	APPLIED CALCULATION	GRAPHIC INFORMATION	SAFETY AND HYGINE
5	1	Knowledge of use and care of measuring instruments such as vernier caliper, micrometer and vernier height gauge.	Calculation regarding to determine the angle, depth and off set position for eccentric turning.	Interpretation of conventional symbols and working drawing.	Importance of using emergency stop.
	2	Knowledge of methods of eccentric turning on lathe machine.			
	3	Knowledge of sequential operation involved in producing work piece.			
	4	Knowledge of turning tools and methods of sharpening, aligning and clamping tools.			
	5	Knowledge of procedure for securely clamping work piece in different work holding devices.			
	6	Knowledge of the factors affecting surface finish & quality of the job.			
	7	Knowledge of types and properties of coolants.			
	8	Knowledge of manual and automatic controls.			

TASK PERFORMANCE TEST (skill assessment)			
11	TASK TITLE : **TURNING ECCENTRIC** TASK No. : 5	LOCATION OF TEST: CANDIDATE'S NAME: EVALUATOR'S NAME:	
12	TEST FACTORS AND ITEMS	STANDARD MET	STANDARD NOT MET (comments)
	DID THE CANDIDATE? 5.1 Select align, grind and clamp the appropriate tool. 5.2 Mark for off set center. 5.3 Tighten and align the work piece for eccentric turning operations. 5.4 Select and set the appropriate speed, feed and depth of cut. 5.5 Supply adequate coolants. 5.6 Select and manipulate appropriate controls. 5.7 Reposition the work piece. 5.8 Change the tools as required to complete eccentric turning operations. 5.9 Produce the work piece within tolerances as specified below:- Linear ± 0.01mm. Angular ± 30 minutes. Surface finish 0.8 microns. Off set deviation ± 0.05 mm. 5.10 Produce the work piece within specified time. 5.11 Follow safety rules.		

LATHE SETTER OPERATOR, L – 3	**NATIONAL SKILL TESTING BOARD**	SCALE-1:1
DATE-		TIME- hrs