Model Curriculum

Mine Machinist

SECTOR: Mining
SUB-SECTOR: Underground and Open Cast Mines
OCCUPATION: Mechanical Maintenance
REF ID: MIN/Q 0424, V1.0
NSQF LEVEL: 4

Skill India
कौशल भारत-कुशल भारत

Certificate

COMPLIANCE TO
QUALIFICATION PACK – NATIONAL OCCUPATIONAL STANDARDS

is hereby issued by the

SKILL COUNCIL FOR MINING SECTOR

for

MODEL CURRICULUM

Complying to National Occupational Standards of
Job Role/ Qualification Pack: 'Mine Machinist' QP No. 'MIN/Q0424 NSQF Level 4'

Date of Issuance: Dec 26th, 2018

Valid up to*: Dec 31st, 2019

*Valid up to the next review date of the Qualification Pack or the 'Valid up to' date mentioned above (whichever is earlier)

Authorised Signatory
(Skill Council for Mining Sector)

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Mine Machinist

CURRICULUM / SYLLABUS

This program is aimed at training candidates for the job of a "Mine Machinist", in the "Mining & Allied" Sector/Industry and aims at building the following key competencies amongst the learner.

Program Name	Mine Machinist		
Qualification Pack Name & Reference ID.	MIN/Q0424, V1.0		
Version No.	1.0	**Version update date**	26.12.2018
Pre-requisites to Training	ITI Machinist		
Training Outcomes	**After completing this program, participants will be able to:** • Interpret job specification through drawings, sketches and sample work piece. • Identify and select machines, cutting fluids and cutting tools. • Prepare machines, cutting tools and measuring tools for the job. • Perform work in process dimensional or surface verification, Bench work, Sawing, Drilling, Shaping and Milling. • Finishing Job & Documentation. • Perform minor machine maintenance activities. • Perform de-burring activity on the machined components. • Check quality of machined component (Gauging). • Tool control/ change process for different worn machine accessories. • Comply health and safety measures critical for mining operations.		

This course encompasses 4 out of 4 National Occupational Standards (NOS) of "Mine Machinist" Qualification Pack issued by "Skill Council for Mining Sector".

Sr. No.	Module	Key Learning Outcomes	Equipment Required
1	**Introduction** **Theory Duration** (hh:mm) **10:00** **Practical Duration** (hh:mm) **10:00** **Corresponding NOS Code** **Bridge Module**	• Explain the role of mine machinist in mining industry. • Describe the process of benching in quarries. • Identify the types of dressing of overhangs, undercuts, fencing. • Explain importance of first aid and personal hygiene. • Follow the basic safety, health and hygiene measures. • Illustrate the standing orders in force at the mine. • Characterize the shot-firing and safety regulations. • Describe the procedure of taking shelter during blasting. • Apply the basic skills of communication. • Identify and interpret signs, notices at display and/or cautions signage at site.	Safety Helmet, gloves, Harness, earplugs, goggles, node mask
2	**Prepare for machining operations** **Theory Duration** (hh:mm) **10:00** **Practical Duration** (hh:mm) **30:00** **Corresponding NOS Code** **MIN/N0468**	• Translate engineering drawings, sketches or sample work piece to identify dimensions and allowances, types and features of work piece material. • Interpret work process documentation to identify machines and its related job operation also sequencing of the job method of machining and its set ups • Determine speed and feeds, cutting tool position, checking work piece alignment and ascertain dimensions to be verified for machine operations. . • Identify the suitable machine including manual and numerically controlled saw,, grills, grinders, vertical or horizontal mills by using engineering drawings, and work process documentation • Identify whether the machine selected is correct for application and check the availability of it. • Identify cutting fluids with the help of engineering drawings, , charts, material safety sheets, • Maximize machining without damage to cutting tools, work piece or machine itself by using the right cutting fluid. • Identify the tooling required to cut the work piece and whether the chosen one is as per the requirement. • Assess the sharpness of the cutting tools and sharpen or replace them according to the shape or angle for cutting keeping personal safety and as per the company procedures/standards in mind. • Determine that the machine controls and systems are checked and are operational and in working condition. It includes switches, buttons, levers, controls, and safety devices	Wrench, Grease, Pump, Hydraulic Jack, Diff Size of Spanner, Allen Key Set, Caliper Inside / Outside, center Punch, Screw Driver, Hammer, file set, Screw Driver Set, Lathe Machine, Drill Machine, Milling machine, LCD Projector

		• Examine whether the work piece selected conforms to the job specification and verify it for its correct size and types by checking codes, lettering or numerical stamps. • Select the appropriate checking and measuring devices to ensure that the device or machine selected is capable of obtaining dimensions and tolerances as per the specifications of the job.	
3	**Perform machining operations** **Theory Duration** (hh:mm) **20:00** **Practical Duration** (hh:mm) **60:00** **Corresponding NOS Code** **MIN/N0469**	• Examine straight cuts by using precision measuring instruments to ensure size finish and parallelism and square ness of the straight cut conforms to the job specifications. • Analyse the shape by using precision measuring instruments and checking device to check whether the profile and the cut of the shape is as per the engineering drawings and job specifications. • Examine the threads with the help of precision measuring instruments to measure the accuracy of the holes in terms of its diameter, depth, position , concentricity and finish should be as per the specified measurements in the drawing or as per the job requirements • Examine tapers with precision checking devices for the accuracy in angle, taper/foot, and its diameter is in accordance to the engineering drawings or job specifications. • Determine the hardness of the work piece using various types of hardness testers and comparison charts to ensure that the hardness level of the work piece material conforms to engineering drawings and job specifications. • Use hand file using correct files to remove excessive material. • Use handsaws using correct cut off saws to cut the work piece in accordance with the job specifications. • Use of hand-drill holes using power drills and drill bits so that the drill holes are as per the job specifications • Use of hand grind using hand or pneumatic grinders to remove excess material from the work piece so as to grind the work piece as per the job specifications • Inspect fused/welded blade and ensure that joined saw has a continuous cutting edge in accordance with manufacturer's or job specifications • Assess the work piece to be in accordance with the lay out features of engineering drawings with the help of precision measuring instruments and different types of layout instruments and layout medium or dye. • Examine to locate and position the work piece in the saw conforming to the operational clearances by setting up work holding device to ensure the piece is aligned, secured, and stable during sawing operations • Use speed and feed chart of saws, drill, laths and milling machine in accordance with the size, type, and hardness	Wrench, Grease, Pump, Hydraulic Jack, Diff Size of Spanner, Allen Key Set, Caliper Inside / Outside, center Punch, Screw Driver, Hammer, file set, Screw Driver Set, Lathe Machine, Drill Machine, Milling machine, LCD Projector

		of work piece material to ensure it performs optimum cutting without damaging the work piece or machine and keeping in mind the personal safety. • Test -run blade while installing it to check alignments and movement in order to prevent machine or blade damage and ensure personal safety. • Check first cut-off piece by measuring and checking it .for its angle, square ness, length and that it is conforming to the job specifications. • Cut shapes using a vertical band saw using required sawing sequences, speeds, feeds, and cutting fluids so that the profile , size and dimensions of the cut shapes are as per the job specifications., • Examine the cut piece after proper deburring with the help of different machines so as to remove excessive material • Inspect the final piece of work by using precision measuring instruments and to make sure it conforms to the job specification. • Select drill tools including drill bits, centre-drill, reamers, taps, counter-bores, countersinks, and spot-faces by using information in engineering drawings and job specifications to ensure tooling is of the correct size, shape, type and grade for the application. • Identify and prepare cutting tools for mills and drills by sharpening or replacing tools so that it gives optimum performance and to ensure personal safety. • Locate and position work piece in drill machine and lathe machine to required operational clearances by setting up and securing work piece with work holding devices so that the work piece is aligned, stable and conforms to the job specification. • Set up tools in drills, mills and laths to required operational alignments using holding devices to ensure that tooling is in position and held tightly during operation. • Use drilling machine, drill bits, and cutting fluids to drill a hole and ensure the hole is as per job specifications. • Take a drilling machine for Chamfer/ Ream a hole countersinks, reamers and cutting fluids to break sharp edges/ and to produce a reamed hole. • Use drilling machine, counter-sinks and cutting fluids to perform counter-boring/counter-sinking, as per job specifications • Select lathe and milling cutting tools by using information from engineering drawings and job instructions • Inspect the lathe-cutting tools by sharpening or replacing so that they could prepared for optimum cutting, efficiency and safety. • Examine that the lathe cutting tools is set up in the required operational alignment by using tool posts , tail stock and ensure the tool are held tightly in right position	

		• Determine reference workface by taking a (preliminary)cut and to check speed and feeds to ensure the lathe is set up • Make a reference point of the datum by zeroing out machine and ensuring that the datum is located correctly • Use a lathe to face a surface and single-point tool bit and by measuring & checking with Vernier, straight edge, or micrometer to ensure surface flatness and finished edge conforms to engineering drawings and job specifications • Use lathe ton turn an external diameter and single-point tool and by measuring or checking with a Vernier or micrometer, so that the turned diameter conforms to engineering drawings and the job specifications • Test for drilling a hole using a lathe, centre-drill, drills, and tailstock for diameter and depth of the drilled hole is as per the job specifications • Bore an internal diameter using a lathe and boring bars mounted in a tool post so that the close -tolerance internal diameters are as per the job specifications • Use lathe, centre-drill, drills, reamers, and tail-stock, to ream a hole and by measuring or checking with Vernier, micrometer, and gauges • Measure a tapped hole used in lathe, taps, tapping head, and tailstock, so that the depth, diameter, and thread pitch of the tapped hole are as per the desired specifications • Use lathe to turn an internal or external thread and single-point tool bit by measuring or checking with thread micrometers and thread plug gauge. • Exhibit a taper using a lathe, offset tail stock, taper-turning attachment, and compound rest, and by measuring or checking with protractors, micrometers, • Choose and prepare the milling cutting tools such as end mills, face mills, shell cutters etc. to sharpen or replace them so that the cutting shapes and angle for optimum cutting and safety. • Establish and maintain milling adjustable support tools ensuring the support tool chosen is the right one for the application and the work piece is located and secured during machining. • Establish milling cutting tools to required operational alignments to ensure the tools are in position and held firmly during machining. • Use a milling machine to make a face mill, multi-point tool bit, face mill, and required cutting fluids so that size, shape square-ness, and flatness of the faced work piece as per the job specifications • Machine steps, cut outs, angles and open slots, using a milling machine so that the size, shape, and angle of the end milled work piece conforms to the engineering and job specifications. • Apply deburr to the work piece using files, scrapers, emery cloth, sanders, and hand or pedestal grinders to remove excess material to ensure safe handling in accordance to the job specifications..	

		• Conduct the final inspection using precision instruments to ensure the tolerances and dimensions of the final milled as per the job specifications • Complete work documentation such as tracking sheets, signoff sheets, inspection reports etc. • Practice good housekeeping in the workplace by cleaning up spills or leaks, keeping work area clean and clear of obstructions, and storing tools or equipment.	
4	**Conducting all post machining operations** **Theory Duration** (hh:mm) **10:00** **Practical Duration** (hh:mm) **30:00** **Corresponding NOS Code** **MIN/N0470**	• Maintain the machine as per routine / daily maintenance checklist. • Perform minor machine maintenance activities such as oiling or cleaning machine and its components • Adding coolant and lubricant in machine reservoir • Examine the chips are removed and sent to the disposal area • Select the correct tool for removing the extra burrs, sharp edges, rust and chips from the metal surface • Use files, hand grinders, wire brushes, or power tools for performing deburring operations. • Use Personal Protective Equipment (PPE) like eyeglasses and hand gloves while performing any operation for personal safety. • Use shot blasting/ vibro processes for automated processes of de-burring operations • Measure the specifications of the finished component and verify conformance as per CP/ WI • Use devices like micrometres, Vernier callipers, gauges, rulers and any other inspection equipment for measuring specifications with valid calibration status. • Observe the basic inspection process and identify pieces which comply with the specified standard • Separate the defective pieces into repairable and not repairable categories and maintain records of each category • Inspect and change different worn machine accessories, such as cutting tools (as per tool life listed, recommended) and brushes, other hand tools • Replace machine part as per work instructions, using hand tools or notify supervisor/ engineering personnel for taking corrective actions • Store after preservation the die/ tools removed from the machine after change –over for the type of part.	
5	**Health and Safety** **Theory Duration** (hh:mm) **10:00** **Practical Duration** (hh:mm)	• Comply with occupational health and safety regulations adopted by the employer. • Follow mining operations procedures with respect to materials handling and accidents • Follow the correct safety steps in case of accident or major failure • Comply with safety regulations and procedures in case of fire hazard. • Operate various grades of fire extinguishers.	Fire Extinguisher Cylinders, First Aid Box, Fire Fighting Charts, First Aid Charts

	20:00 **Corresponding NOS Code** **MIN/N0901**	• Work responsibly and as safe and careful as possible so as not to put the health and safety of self or others at risk, including members of the public • Perform storage and transport of hazardous materials compliant with safety guidelines prescribed by DGMS. • Deal with misfires as per statutory requirement • Identify characteristics of post-blast fumes and take necessary precautions. • Wears safety gear such as hard hat, respiratory protection, eye protection, ear protection • Follow the manufacturer's instructions for care and safe operation of the equipment.	
	Total Duration **Theory Duration** 60:00 **Practical Duration** 150:00	**Unique Equipment Required:** Helmet, Dust Mask, Goggles, Ear Plug, Gloves, Reflective Jacket, Safety Belt, Gum Boots/ Safety shoes	

Grand Total Course Duration: 210 Hours, 0 Minutes
(This syllabus/ curriculum has been approved by SSC: Skill Council for Mining Sector)

Trainer Prerequisites for Job role: "Mine Machinist" mapped to Qualification Pack: "MIN/Q0424", V1.0

Sr. No.	Area	Details
1	**Description**	To deliver accredited training service, mapping to the curriculum detailed above, in accordance with the Qualification Pack "MIN/Q0424", Version 1.0
2	**Personal Attributes**	Aptitude for conducting training, and pre/post work to ensure competent, employable candidates at the end of the training. Strong communication skills, interpersonal skills, ability to work as part of a team; a passion for quality and for developing others; well-organized and focused, eager to learn and keep oneself updated with the latest in the mentioned field.
3	**Minimum Educational Qualifications**	ITI Machinist
4a	**Domain Certification**	Certified for Job Role: Mine Machinist mapped to QP: "MIN/Q0424, v1.0". Minimum accepted score as per SSC guidelines is 80% on the SSC prescribed online theory assessment test based on an industry validated question bank.
4b	**Platform Certification**	Recommended that the Trainer is certified for the Job Role: "Trainer", mapped to the Qualification Pack: "MEP/Q0102". Minimum accepted score for the trainer is 80% as per SSC guidelines.
5	**Experience**	The minimum required experience for the trainer is: - For ITI - 6 years relevant field experience For Diploma in Mechanical - 5 years relevant field experience For B-Tech in Mining - 4 years relevant field experience

Annexure: Assessment Criteria

Job Role: Mine Machinist
Qualification Pack: MIN/Q0424, V1.0
Sector: Skill Council Skill Council for Mining Sector

Guidelines for Assessment

1. Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down proportion of marks for Theory and Skills Practical for each PC.
2. The assessment for the theory part will be based on knowledge bank of questions created by the SSC.
3. Individual assessment agencies will create unique question papers for theory part for each candidate at each examination/training center (as per assessment criteria below).
4. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training center based on these criteria.
5. To pass the Qualification Pack, every trainee should score a minimum of 70% in every NOS.
6. In case of successfully passing only certain number of NOS's, the trainee is eligible to take subsequent assessment on the balance NOS's to pass the Qualification Pack.

				Marks Allocation	
		Total Mark (100)	**Out Of**	**Theory**	**Skills Practical**
1.MIN/N0468(Prepare for machining operations)	PC1. Read and interpret engineering drawings, sketches or sample work piece to identify dimensions and tolerances, machine surface designations and allowances, type and features of work piece material	**25**	2	1	1
	PC2. Read and interpret work-process documentation to identify required machines, job operation, sequencing of job, method of machining and set-ups		2	1	1

	PC3. Perform calculations for machining operations including determining speeds and feeds, calculating cutting tool positions, checking work piece alignments, and calculating dimensions to be measured and verified		2	1	1
	PC4. Identify and select machines including conventional and numerically controlled saws, drills, lathes, grinders, and vertical or horizontal mills, using information from engineering drawings and work process documentation, to ensure that the machine selected is the correct one for the application and available to perform the job		3	2	1
	PC5. Identify and select cutting fluids using manuals, charts, engineering drawings, and material safety data sheets, ensuring that the cutting fluid selected is the correct one to maximize machining without damage to work piece, cutting tool, or machine		3	1	2
	PC6. Identify and select tooling required to cut the work piece by using information in engineering drawings and job instructions		3	2	1
	PC7. Identify and prepare cutting tools by sharpening or replacing tools so that the cutting shape and angle are prepared for optimum cutting and personal safety in accordance with manufacturer's specifications, engineering drawings, sketches, sample work piece and company standards/procedures		2	1	1
	PC8. Identify and check machine controls and systems including locating and identifying switches, buttons, levers, controls, and safety devices, to ensure that all controls are operational and functioning		2	1	1
	PC9. Verify work piece material for correct size and type by checking codes, lettering, or numerical stamps to ensure that the work piece selected conforms to job instruction specification		2	1	1

	PC10. Identify and select measuring instruments and checking devices, ensuring that instruments and devices selected are capable of measuring to obtain the dimensions and tolerances specified as per the job specifications		2	1	1
	PC11. Select machine speeds and feeds using speed and feed charts and in accordance with size, type, and hardness of work piece materials		2	1	1
		Total	**25**	**13**	**12**
2. MIN/N0469:(Perform machining operations)	PC1. Check straight cuts by using precision measuring instruments including (not limited to)micrometer, verniers, callipers, squares, straight edge, dial indicator, and surface comparator, to ensure that the accurate size, finish, parallelism, and squareness of straight cuts conform with job specifications	**25**	0.5	0.35	0.15
	PC2. Check shapes by using precision measuring instruments and checking devices including(not limited to) radius gauges, surface comparator, and verniers, to ensure that the profile and finish of the cut shape conform to engineering drawing and job specifications		0.5	0.35	0.15
	PC3. Check threads by using precision measuring instruments, checking devices, and various checking methods including (not limited to) 3- wire method, thread micrometer, thread gauge, and plug or ring gauges, to ensure that the accuracy of pitch, thread geometry, and size of cut threads conform to job specifications		0.5	0.35	0.15
	PC4. Check holes by using precision measuring instruments and checking devices including(not limited to) dial indicators, bore gauges, plug gauges, telescopic gauges, surface comparators, and vernier, to ensure that the accuracy of the diameter, depth, concentricity, position, and finish of cut holes conform with engineering drawings and job specifications		0.5	0.35	0.15

	PC5. Check tapers using precision measuring instruments and checking devices including (not limited to) taper gauge, sine bar, micrometer, and vernier to ensure that the accuracy of the angle, taper/foot, and diameter of the cut tapers conform with engineering drawings and job specifications		0.5	0.35	0.15
	PC6. Check hardness using various types of hardness testers and comparison charts to ensure that the hardness level of the work piece materials conforms with engineering drawings and job specifications		0.5	0.35	0.15
	PC7. Hand-file using files including (not limited to) flat, needle, rat-tail, lathe, and half-round files to remove excessive material so that work piece is filed		0.5	0.35	0.15
	PC8. Hand-saw using cut-off saws to cut work piece to specified lengths in accordance with job specifications		0.5	0.35	0.15
	PC9. Hand-drill holes using power drill and drill bits so that the size of the drilled hole conform with job specifications		0.5	0.35	0.15
	PC10. Hand-grind using pneumatic or electric hand grinders to remove excess material, so that the work piece is ground in accordance with job specifications		0.5	0.35	0.15
	PC11. Check fused/welded blade to ensure that joined saw has a continuous cutting edge in accordance with manufacturer's or job specifications		0.5	0.35	0.15

	PC12. Lay out features of engineering drawings on to the work piece using precision measuring instruments and layout equipment including (not limited to) scriber, center, punch, vernier height gauge, surface plate, combination set, and layout medium or dyes		0.5	0.35	0.15
	PC13. Locate and position work piece in saw to required operational clearances by setting up work holding devices including (not limited to) clamps, nesting fixtures, vises, or roller supports, so that the work piece is aligned, secured, and stable during sawing operations		0.5	0.35	0.15
	PC14. Select speeds and feeds of saws using speed and feed charts and in accordance with the size, type, and hardness of work piece material, so that the saw performs optimum cutting without damage to work piece, cutting tools, or machines, and ensures personal safety		0.5	0.35	0.15
	PC15. Install and test-run blade to check alignments and movements, so that the blade is installed to make the required cut, prevents machine or blade damage, and ensures personal safety		0.5	0.35	0.15
	PC16. Check first cut-off by measuring and checking a cut-off piece, to ensure that the angles, squareness, and length of the sawed piece conform to job specifications		0.5	0.35	0.15
	PC17. Cut shapes using a vertical band saw using required sawing sequences, speeds, feeds, and cutting fluids, so that the profile, size, and dimensions of the cut shapes conform to job specifications		0.5	0.35	0.15
	PC18. Deburr work piece using files, scrapers, emery cloth, sanders, and hand or pedestal grinders, to remove excess material and to ensure safe handling		0.5	0.35	0.15

	PC19. Perform final inspection using precision measuring instruments and checking devices including (not limited to) inside and outside micrometers, vernier height gauges or indicators, gauge blocks, and pin gauges, to ensure that the tolerances and dimensions of the sawed work piece conform to the engineering drawings and job specifications		0.5	0.35	0.15
	PC20. Select drill tooling including drill bits, center-drill, reamers, taps, counter-bores, counter sinks, and spot- faces by using information in engineering drawings and job specifications to ensure that tooling is the correct size, shape, type, and grade for the application		0.5	0.35	0.15
	PC21. Identify and prepare cutting tools for drills by sharpening or replacing tools, so that the cutting shape and angle is prepared for optimum cutting and personal safety		0.5	0.35	0.15
	PC22. Locate and position work piece in drill to required operational clearances by setting up and securing work piece with work holding devices including (not limited to) drilling vises, clamps, jigs, angle plates, and chucks, so that the work piece is aligned, secured, and stable during drilling in accordance with job specifications		0.5	0.35	0.15
	PC23. Set up tooling in drills to required operational alignments using holding devices including (not limited to) drill chucks, taper sleeves, and tapping heads, to ensure that tooling is in position and held securely during drilling		0.5	0.35	0.15

	PC24. Select speeds and feeds of drill using speed and feed charts and in accordance with the size, type, and hardness of work piece material, so that the drill performs optimum cutting without damage to work piece, cutting tools, or machines, and ensures personal safety		0.5	0.35	0.15
	PC25. Centre-drill a layout punch mark using a drill press/machine, chuck, centre-drill, and cutting fluid, so that the punch mark is drilled in accordance with job specifications		0.5	0.35	0.15
	PC26. Drill a hole using a drilling machine, drill bits, and cutting fluids, so that the size and depth of drilled hole conform to job specifications		0.5	0.35	0.15
	PC27. Chamfer/ Ream a hole using a drilling machine, countersinks, reamers and cutting fluids to break sharp edges/ and to produce a reamed hole		0.5	0.35	0.15
	PC28. Perform counter-boring/counter-sinking using a drilling machine, countersinks, and cutting fluids to conform to job specifications		0.5	0.35	0.15
	PC29. Select lathe cutting tools including (not limited to) drill bits, boring, parting, threading, facing, or turning tools, by using information from engineering drawings and job instructions		0.5	0.35	0.15
	PC40. Ream a hole using a lathe, centre-drill, drills, reamers, and tail- stock, and by measuring or checking with vernier, micrometer, and gauges		0.5	0.35	0.15
	PC41. Tap a hole using on lathe, taps, tapping head, and tailstock, so that the depth, diameter, and thread pitch of the tapped hole are as per the desired specifications		0.5	0.35	0.15

	PC42. Turn an internal or external thread using a lathe and single-point tool bit and by measuring or checking with thread micrometers and thread plug gauge (go-no-go)		0.5	0.35	0.15
	PC43. Produce a taper using a lathe, offset tail stock, taper-turning attachment, and compound rest, and by measuring or checking with protractors, micrometers,		0.5	0.35	0.15
	PC44. Select milling cutting tools including (not limited to) end mills, face mills, shell cutters, slot drills, boring bars, slitting saws, and boring head		0.5	0.35	0.15
	PC45. Identify and prepare milling cutting tools by sharpening or replacing tools so that the cutting shape and angle is prepared for optimum cutting and personal safety		0.25	0.25	0
	PC46. Set-up and maintain milling adjustable support tools including (not limited to) indexing heads, vises, angle plates, sine bars, and tables, ensuring that the support tool is the correct one for the application and the work piece is located and secured during machining		0.25	0.25	0
	PC47. Set-up milling cutting tools to required operational alignments using arbours, collets, and drill chucks, to ensure the tools are in position and held securely during machining		0.5	0.35	0.15
	PC48. Select speeds and feeds of mill using speed and feed charts and in accordance with the size, type, and hardness of work piece material, so that the mill performs optimum cutting without damage to work piece, cutting tools, or machine and ensures personal safety		0.25	0.25	0
	PC49. Face-mill using a milling machine, multi-point tool bit, face mill, and required cutting fluids, so that the size, shape, squareness, and flatness of the		0.5	0.35	0.15

	faced workpiece conform to engineering drawings and job specifications				
	PC50. Machine steps, cut-outs, angles, and open slots using a milling machine, end mill, and required cutting fluid, so that the size, shape, and angle of the end-milled work piece conform to engineering drawings and job specifications		0.5	0.35	0.15
	PC51. Deburr work piece using files, scrapers, emery cloth, sanders, and hand or pedestal grinders to remove excess material and to ensure safe handling in accordance with engineering drawings, job specifications		0.25	0.25	0
	PC52. Perform final inspection using precision measuring instruments and checking device instruments including (not limited to) inside and outside micrometers, vernier height gauges or indicators, gauge blocks, and pin gauges, to ensure that the tolerances and dimensions of the milled work piece conform to the engineering drawings and job specifications		0.5	0.25	0.25
	PC53. Complete work documentation including (not limited to) tracking sheets, sign-off sheets, inspection reports or procedure sheets to record the finalization of jobs and to facilitate traceability of work-in-process, ensuring that all data is recorded accurately and clearly in accordance with engineering drawings, job specifications, and company standards/procedures		0.25	0.25	0

	PC54. Practice good housekeeping in the workplace by cleaning up spills or leaks, keeping work area clean and clear of obstructions, and storing tools or equipment, so that that potential for accident or injury is prevented and tools or equipment are in place and available in compliance with company standards/procedures	**Total**	0.25	0.25	0
			25	**18**	**7**
3. MIN/N0470 : (Conducting all post machining operations)	PC1. Maintain the machine as per routine/daily maintenance checklist. Perform min or machine maintenance activities such as oiling or cleaning machine and its components	25	2	1	1
	PC2. Adding coolant and lubricant in machine reservoir		2	1	1
	PC3. Getting the chips removed and sent to the disposal area		2	1	1
	PC4. With the help of the correct tool remove the extra burrs, sharp edges, rust and chips from the metal surface		2	1	1
	PC5. Use files, hand grinders, wire brushes, or power tools for performing de burring operations. Ensure usage of Personal Protective equipment's like eyeglasses and hand gloves.		2	1	1
	PC6. For automated processes performs hot blasting/vibe processes for completing-burring operations		2	1	1
	PC7. Measure the specifications of the finished component and verify conformance as per CP/WI		2	1	1
	PC8. Use devices like micrometers, vernier calipers, gauges, rulers and any other inspection equipment for measuring specifications with valid calibration status.		2	1	1
	PC9. Note down the observations of the basic inspection process and identify pieces which comply with the specified standard		1	1	0

	PC10.Separatethe defective pieces into two categories– pieces which can be paired/ modified and pieces which are be yond repair and maintain records of each category		1	1	0
	PC11.Organize changing different worn machine accessories, such as cutting tools(as per tool life listed, recommended) and brushes, other hand tools		1	1	0
	PC12.Replacemachinepart as per work instructions, using hand tools or notify supervisor/ engineering personnel for taking corrective actions		2	1	1
	PC13.For automated process observe the tool change cycle in order to ensure that the selected tool is transferred to the spindle from magazine after the previous tool is transferred to the magazine from the spindle		2	1	1
	PC14.Storeafterpreservationthedie/tools removed from the machine after change–over for the type of part.		2	1	1
		Total	**25**	**14**	**11**
4. MIN/ N0901 (Health and Safety)	PC1. Comply with occupational health and safety regulations adopted by the employer.	25	2	1	1
	PC2. Follow mining operations procedures with respect to materials handling and accidents		3	2	1
	PC3. Follow the correct safety steps in case of accident or major failure		2	1	1
	PC4. Comply with safety regulations and procedures in case of fire hazard.		2	1	1
	PC5. Operate various grades of fire extinguishers.		3	2	1
	PC6. Work responsibly and as safe and careful as possible so as not to put the health and safety of self or others at risk, including members of the public		2	1	1

	PC7. Perform storage and transport of hazardous materials compliant with safety guidelines prescribed by DGMS.		3	2	1
	PC8. Deal with misfires as per statutory requirement		2	1.5	0.5
	PC9. Identify characteristics of post- blast fumes and take necessary precautions.		2	1.5	0.5
	PC10. Wears safety gear such as hard hat, respiratory protection, eye protection, ear protection		2	1	1
	PC11. Follow the manufacturer's instructions for care and safe operation of the equipment.		2	1	1
		Total	**25**	**15**	**10**