**CONTACT DETAILS OF THE AWARDING BODY FOR THE QUALIFICATION**

**Name and address of awarding body:** Central Institute of Plastics Engineering and Technology (CIPET), Ministry of Chemicals and Fertilizers, Department of Chemicals and Petrochemicals, Govt. of India, Hajipur, Industrial Area, Vaishali, Bihar. 844102.

**Name and contact details of individual dealing with the submission**

Dr. P.C. Padhi, Director& Head, CIPET Hajipur, Industrial Area, Vaishali, Bihar. 844102. Ph: +91-6224-277424,270085,273515.

E-mail address**:**cipetpatna@gmail.com, hajipur@cipet.gov.in

**SUMMARY**

|  |
| --- |
| **Qualification Title:** Machine Operator Tool Room |
| **Nature and Purpose of the qualification:**  A CIPET trade certificate for Machine Operator Tool Room and the he individual at work sets up and operates the Conventional & CNC machines to produce good quality products from raw materials. He is responsible for produce Mould, Dies and fixtures from raw material by operating conventional, semi, & fully automatic CNC machines, troubleshooting problems and performing minor maintenance to ensure continued operation of the production line. They are also responsible for completing the output learn good manufacturing practices. |
| **Body/bodies which will award the qualification:**  Central Institute of Plastics Engineering and Technology (CIPET), Ministry of Chemicals and Fertilizers, Department of Chemicals and Petrochemicals, Govt. of India, Hajipur, Industrial Area, Vaishali, Bihar. 844102. |
| **Body which will accredit providers to offer courses leading to the qualification:**  Central Institute of Plastics Engineering and Technology (CIPET), Ministry of Chemicals and Fertilizers, Department of Chemicals and Petrochemicals, Govt. of India, Hajipur, Industrial Area, Vaishali, Bihar. 844102. |
| **Body/bodies which will be responsible for assessment:**  The assessment is being carried out at of Central Institute of Plastics Engineering and Technology (CIPET), Ministry of Chemicals and Fertilizers, Department of Chemicals and Petrochemicals, Govt. of India, Hajipur, Industrial Area, Vaishali, Bihar. 844102. |
| **Occupation(s) to which the qualification gives access:**  Machine Operator Tool Room occupation in Mould, Dies and fixtures manufacturing. |
| **Proposed level of the qualification in the NSQF: 4 (CPC/Q 5104)** |
| **Anticipated volume of training/learning required to complete the qualification:**  720 Notional hours. |
| **Entry requirements / recommendations:**  Minimum qualification – Preferably Min - Class 8th Standard, Minimum age - 18 years completed. |
| **Progression from the qualification:**  The Machine Operator Tool Room has a clear pathway. |
| **Planned arrangements for the Recognition of Prior learning (RPL):**  RPL arrangements are being developed and will be informed in due course of time. |
| **International comparability where known:** It will be carried out in next phase as comparability is being verified. |
| **Date of planned review of Qualification:** 20.10.2018 |

|  |  |  |  |
| --- | --- | --- | --- |
| Format Structure of the Qualification: Machine Operator Tool Room | | | |
| Title and Identification code of component | Mandatory/ Optional | Estimated Size (Notional Hours) | Level |
| 1. Maintain basic health and Safety practices at the workplace | M | 40 |  |
| 1. Understanding the basic concepts, design, drawings and planning for machining components, making tools & dies and coordinating with others | M | 100 |  |
| 1. Perform fitting operations on machining components using hand tools | M | 100 |  |
| 1. Operation on Drilling | M | 100 |  |
| 1. Operation on Shaper | M | 100 |  |
| 1. Operation on LATHE | M | 100 |  |
| 1. Operation on MILLING Machine | M | 100 |  |
| 1. Operation on Grinding   Machine | M | 100 |  |
| 1. Basic Programming and Operation on CNC Machines | M | 200 |  |
| 1. Working effectively with others | M | 20 |  |
|  |  | 960 |  |

|  |
| --- |
| **Body/Bodies which will carry out assessment:**  A Separate department/ body -Training Assessment Wing of Central Institute of Plastics  Engineering and Technology (CIPET), Ministry of Chemicals and Fertilizers, Department of Chemicals and Petrochemicals, Govt. Of India, Hajipur, Vaishali, Bihar 844102.  **Will the assessment body be responsible for RPL assessment?**  RPL arrangements are being developed and will be informed in due course of time.  **Describe the overall assessment strategy and specific arrangements which have been put in place to ensure that assessment is always valid, consistent and fair and show that these are in line with the requirements of the NSQF:**  With uniformity and setting of learning outcomes for different Jobs Roles the assessment of candidates will be at learning outcome level. Assessment criterion has been defined for each learning outcome and it includes both theoretical and practical skills on which the candidate will be assessed. The question suite which will be used to check the skills of the trainee would include  **Theoretical test suite –** Will include multiple choice questions, audio-video question etc.  which will test the trainee on his knowledge of the subject  **Practical Knowledge suite –** Practical knowledge can be tested through Assessor driven evaluation/test, Situational Judgment Tests etc to test practical core competence. A mix of these would be able to evaluate the trainee on his practical knowledge of the  Qualification Document.  **Assessment strategy:**   1. Assessment criteria for Qualification Document have been developed. Each Learning Outcome have separate marks for Theory and Practical Skills. 2. The Training Assessment Wing will have assessors who will not be associated with training activities and will be provided training on the said work. Thus it will ensure that the assessment carried out is fair and consistent. 3. Set of question bank developed to assess the theoretical and practical knowledge. To ensure the quality, each trainees get the unique set of question 4. Student has to score minimum marks separately for theoretical and practical skill and overall percentage should also be 50% for theory and 70% for practical. 5. Empanelment of subject matter expert as assessor to assess trainee specifically on practical skills 6. Assessments are preferably conducted by written examination papers in English/   regional languages according to the requirement.   1. It has been ensure that TP/trainer should not be present during assessment |

**Assessment Process Flow:**

**Request for evaluation of batch by**

**Training Partner**



**Allocation of batch to Training Assessment wing**



**Evaluation of batch by Training Assessment wing as per schedule and as per Assessment Process**



**Assessment observation data input sheet from Training Assessment wing including viva, practical and theory marks**



**Result finalization**



**Uploading of result on IT database platform**

**Summative Assessment**:

Based on the Total Marks allotted for the specific subject, formal evaluation shall be conducted. Based on secured marks, candidates shall be declared pass or fail.

Steps undertaken for summative assessment:

1. Based on Completion of Batch, Evaluation Schedule shall be prepared
2. Identified Assessor is nominated for Evaluation
3. Setting up of separate Question Paper for Theory & Practical Examination
4. Conduct of examination as per the schedule
5. Evaluation & Certification

**Evidence Collected during Assessment:** Theoretical Answer Sheets, Practical Exam Sheets,Evaluation Sheets, Jobs produced during practical Exams.

**Protocol for Selection of Assessors:**

* The Assessors should have the minimum qualification: Degree in Engineering.
* The Assessors should have minimum 5 years of Experience in the relevant field.

**ASSESSMENT EVIDENCE**

**Assessment Guidelines:**

1. Criteria for assessment for each Qualification Document will be created by CIPET.
2. Each Assessable outcome (AO) will be assigned marks proportional to its importance in Learning Outcome and few performance criteria may be allotted marks in combine.
3. Each Learning Outcome will be assessed both for theoretical knowledge and practical which is being proportionately demonstrated in the table below.
4. The assessment for the theory part will be based on knowledge bank of questions created by CIPET which will contain multiple choice theory questions and Practical question database with mark allotment criteria.
5. To pass the Qualification Document, every trainee should score a minimum of 50 % in Functional and all Generic Learning Outcome’s.
6. In case of successfully passing only certain number of Learning Outcome’s, the trainee is eligible to take Subsequent assessment on the balance Learning Outcome’s to pass the Qualification Document.

**Title of the Component:** Machine Operator Tool Room

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Assessable outcome** | | **Assessment criteria for the**  **outcome** | | |
| **LO** | **Assessable outcome Description** | **Theory** | **Practical** | **Total** |
| 1. CPC/N5109 Maintain basic health and safety practices at the workplace,5S | AO1. use protective clothing/equipment for specific tasks and work conditions  AO2. state the name and location of people responsible for health and safety in the workplace  AO3. state the names and location of documents that refer to health and safety in the workplace  AO4. state location of general health and safety equipment in the workplace  AO5. inspect for faults, set up and safely use steps and ladders in general use  AO6. work safely in and around confined areas  AO7. lift heavy objects safely using correct procedures  AO8. apply good housekeeping practices at all times  AO9. identify common hazard signs displayed in various areas  AO10. retrieve and/or point out documents that refer to health and safety in the workplace  AO14. use the various appropriate fire extinguishers on different types of fires correctly  AO15. demonstrate rescue techniques applied during fire hazard  AO16. demonstrate good housekeeping in order to prevent fire hazards  AO17. demonstrate the correct use of a fire extinguisher  AO18. demonstrate how to free a person from electrocution  AO19. Administer appropriate first aid to victims were required eg. in case of bleeding, burns, choking, electric shock, poisoning etc  AO20. demonstrate basic techniques of bandaging  AO21. respond promptly and appropriately to an accident situation or medical emergency in real or simulated environments  AO22. perform and organize loss minimization or rescue activity during an accident in real or simulated environments  AO23. administer first aid to victims in case of a heart attack or cardiac arrest due to electric shock, before the arrival of emergency services in real or simulated cases  AO24. demonstrate the artificial respiration and the CPR Process  AO25. participate in emergency procedures  AO26. complete a written accident/incident report or dictate a report to another person, and send report to person responsible  AO27. demonstrate correct method to move injured people and others during an emergency  AO28 Follow the sorting process and check that the tools that are lying on workstations are the ones in use and unnecessary items are not disarranging the workbenches or work surfaces  AO29 Sort the tools/ equipment/ fasteners/ spare parts as per specifications/ utility into proper trays, cabinets, lockers as mentioned in the 5S guidelines/ work instructions.  AO30 Follow the floor markings/ area markings used for demarcating the various sections in the plant as per the prescribed instructions and standards  AO31. Ensure that the area has floors swept, machinery clean and generally clean. In case of cleaning, ensure that proper displays are maintained on the floor which indicate potential safety hazards  AO32. Check whether all hoses, cabling & wires are clean, in good condition and clamped to avoid any mishap or mix up  AO33. Ensure workbenches and work surfaces are clean and in good condition  AO34. Follow the cleaning schedule for the lighting system to ensure proper illumination  AO35. Store the cleaning material and equipment in the correct location and in good condition  AO36. Ensure self-cleanliness - clean uniform, clean shoes, clean gloves, clean helmets, personal hygiene | 12 | 28 | **40** |
|  | Sub total | 12 | 28 | **40** |
| 1. CPC/N5110 Understanding the basic concepts, design, drawings and planning for machining components, making tools & dies and coordinating   with others | AO1. adhere to procedures or systems in place for health and safety, personal  protective equipment (PPE) and other relevant safety regulations  AO2. ensure all the machines used are in a safe and useable condition  AO3. ensure that all the tool room machines are correctly guarded at all times  AO4. obtain sample component/ drawings and other engineering information as per company procedures  AO5. identify requirements by analyzing sample component, design and drawing  AO6. Plan sequence of operations for machining component keeping in mind various considerations like requirements, timelines, resources available, interdependencies, constraints, compliances, etc.  AO7. report and rectify cases of inappropriate information in design documents as per organizational procedures  AO8. compute dimensions, sizes, shapes and tolerances of machining component are as per specifications and as per company procedures  AO9. determine information such as number of parts to make, engineered components and material to be used, and machines to be used  AO10. identify and confirm resources required such as components, machinery, range of materials and processes  AO11. identify the operations that will be required for machining components based on design requirements  AO12. identify type of equipment required for machining components based on the operations selected  AO13. estimate timelines for each task accurately  AO14. establish work completion time by determining a schedule of operations  AO15. obtain necessary approvals for the action plan  AO16. allocate responsibilities to machine operators as per the operations selected  AO17. ensure that the machine operators are clear about the sequence of activities, priorities and considerations  AO18. release drawings and machining specifications to machine operators  AO19. identify and select machines for machining components based on design and drawings  AO20. identify and select cutting tools based on design and drawings  AO21. select and procure appropriate metals to be used for machining components as per design requirement  AO22. hand over cutting tools and raw material for machining to the machine operators  AO23. handle all clarifications sought by the operators  AO24. collect job from all operators  AO25. check the jobs as per drawing/instruction  AO26. ensure in-process inspection of the machining component | 30 | 70 | **100** |
|  | Sub total | 30 | 70 | **100** |
| 3.CPC/N5111 Perform fitting operations on machining components using hand tools | AO1. comply with health and safety, environmental and other relevant regulations and guidelines at work  AO2. adhere to procedures and guidelines for personal protective equipment (PPE) and other relevant safety regulations while performing die fitting operations  AO3. work following laid down procedures and instructions  AO4. ensure work area is clean and safe from hazards  AO5. ensure that all tools, equipment, power tool cables, extension leads are in a safe and usable condition  AO6. obtain job specification from a valid and approved source  AO7. read and understand job requirements from the job specification document properly  AO8. report and rectify incorrect information in job specification  documents as per job requirement  AO9. preparation for the fitting operations as per procedure  AO10. ensure that all calibrated measuring instruments used.  AO11. ensure that the components used are free from foreign objects, dirt and corrosion  AO12. obtain correct work pieces and consumables as per job requirements  AO13. obtain appropriate tools and measuring instruments.  AO14. Setting of work pieces as per job requirements using appropriate holding devices  AO15. Marking specified features with the help of marking-out methods on the work pieces as per job specification by using appropriate measuring and marking tools.  AO16. mark out templates for tracing/transferring the specified features on the work pieces as per drawing  AO17. Tracing or transfer the specified features from the templates onto the work pieces as per drawing  AO18. perform fitting operations on various forms of metal components using a range of hand tools and manually operated machines  AO19. follow the specified machining sequence and procedure as per job specifications  AO20. check the machined components to ensure completeness of work  AO21. check the quality of the output as per required standards, using visual checks and measurement of dimensional parameters using measuring instruments.  AO22. produce components with various features as per standards applicable to the process  AO23. Check the finished components as per job requirement  AO24. complete documentation during and post operations as per procedures  AO25. return all tools and equipment to the correct location on completion of the fitting activities  AO26. leave the work area in a safe and tidy condition on completion of job activities | 30 | 70 | **100** |
|  | Sub total | 30 | 70 | **100** |
| 4. CPC/N5112: Operation on Drilling | AO1. comply with health and safety, environmental and other relevant regulations and guidelines at work  AO2. adhere to procedures and guidelines for personal protective equipment (PPE) and other relevant safety regulations while performing machining operations  AO3. ensure work area is clean and safe from hazards  AO4. ensure that all tools, equipment, power tool cables, extension leads are in a safe and usable condition  AO5. ensure that machine guards are in place and are correctly fitted.  AO6. read and understand safety instructions, warning signs on the machine  AO7. ensure that all measuring equipment is within calibration due date  AO8. ensure availability of job specification from a valid source/Drawings  AO9. read and establish job requirements from the job specification document **Job**  AO10. ensure that the incoming components used are free from foreign objects, dirt or other contamination  AO11. prepare and maintain the work area as per procedure or operation specification  AO12. plan to carry out the required drilling activities and the sequence of operations as per specifications  AO13. apply safe working practices and procedures at all times  AO14. obtain all the appropriate materials, cutting tools and measuring equipments required for the drilling operations  AO15. confirm that the machine is ready for production  AO16. prepare for the Drilling activities by mounting, positioning and correctly setting a range of work holding devices and cutting tools  AO17. seek any necessary instruction/training on the operation of the machine, where required  AO18. hold components securely, without distortion  AO19. ensure that machine settings are adjusted as and when required to maintain the required accuracy  AO20. obtain the component drawings, specifications, job instructions required for the components to be machined  AO21. use and extract information from engineering drawings and related specifications (to include symbols and conventions to appropriate IS or ISO standards in relation to work undertaken)  AO22. set and adjust the machine tool speeds and feeds to achieve the component specification  AO23. mount and set the required work holding devices, work piece and cutting tools  AO24. operate the machine tool controls safely and correctly, in line with operational procedures  AO25. control the machine in both hand and power modes for normal operations  AO26. stop the machine in both normal and emergency situations correctly, and follow right procedure for restarting after an emergency  AO27. use drilling machine accessories that consists of vices, drill chuck, sleeves, clamps, tool holders.  AO28. position and secure work holding devices to the machine spindle  AO29. perform drilling operations using various equipments to produce components with various features  AO30. produce components as per given quality standards  AO31. plan and work to achieve given production targets  AO32. overcome the effects of backlash in machine slides and screws  AO33. perform the technique of trial cut for checking dimensional accuracy  AO34. apply roughing and finishing cuts, considering the effect on tool life, surface finish and dimensional accuracy  AO35. use cutting fluids for different materials  AO36. use range of measuring instruments to check critical parameters  AO37. clamp the work piece in a chuck/work holding device  AO38. perform the checks to be carried out on the components before removing them from the machine, and the equipment needed for this activity  AO39. ensure that the quality control procedures are used while operating the equipment | 30 | 70 | **100** |
|  | Sub total | 30 | 70 | **100** |
| 5. CPC/N5113: Operation on  Shaping | AO1. comply with health and safety, environmental and other relevant regulations and guidelines at work  AO2. adhere to procedures and guidelines for personal protective equipment (PPE) and other relevant safety regulations while performing machining operations  AO3. ensure work area is clean and safe from hazards  AO4. ensure that all tools, equipment, power tool cables, extension leads are in a safe and usable condition  AO5. ensure that machine guards are in place and are correctly fitted  AO6. read and understand safety instructions, warning signs on the machine  AO7. ensure that all measuring equipment is within calibration due date  AO8. ensure availability of job specification from a valid source/Drawings  AO9. read and establish job requirements from the job specification document  AO10. ensure that the incoming components used are free from foreign objects, dirt or other contamination  AO11. prepare and maintain the work area as per procedure or operation specification  AO12. plan to carry out the required shaping activities and the sequence of operations as per specifications  AO13. apply safe working practices and procedures at all times  AO14. obtain all the appropriate materials, cutting tools and measuring equipments required for the shaping operations  AO15. confirm that the machine is ready for production  AO16. prepare for the shaping activities by mounting, positioning and correctly setting a range of work holding devices and cutting tools  AO17. seek any necessary instruction/training on the operation of the machine, where required  AO18. hold components securely, without distortion  AO19. ensure that machine settings are adjusted as and when required to maintain the required accuracy  AO20. obtain the component drawings, specifications, job instructions required for the components to be machined  AO21. use and extract information from engineering drawings and related specifications (to include symbols and conventions to appropriate IS or ISO standards in relation to work undertaken)  AO22. set and adjust the machine tool speeds and feeds to achieve the component specification  AO23. mount and set the required work holding devices, work piece and cutting tools  AO24. operate the machine tool controls safely and correctly, in line with operational procedures  AO25. control the machine in both hand and power modes for normal operations  AO26. stop the machine in both normal and emergency situations correctly, and follow right procedure for restarting after an emergency  AO27. use shaping machine accessories that consists of vices, clamps, tool holders.  AO28. position and secure work holding devices to the machine ram  AO29. perform shaping operations using various equipments to produce components with various features  AO30. produce components as per given quality standards  AO31. plan and work to achieve given production targets  AO32. overcome the effects of backlash in machine slides  AO33. perform the technique of trial cut for checking dimensional accuracy  AO34. apply roughing and finishing cuts, considering the effect on tool life, surface finish and dimensional accuracy  AO35. use cutting fluids for different materials  AO36. use range of measuring instruments to check critical parameters  AO37. clamp the work piece in a chuck/work holding device  AO38. perform the checks to be carried out on the components before removing them from the machine, and the equipment needed for this activity  AO39. ensure that the quality control procedures are used while operating the equipment | 30 | 70 | **100** |
|  | Sub total | 30 | 70 | **100** |
| 6.CPC/N5114: Operation on Lathe machine | AO1. comply with health and safety, environmental and other relevant regulations and guidelines at work  AO2. adhere to procedures and guidelines for personal protective equipment (PPE) and other relevant safety regulations while performing turning operations  AO3. ensure work area is clean and safe from hazards  AO4. ensure that all tools, equipment, power tool cables, extension leads are in a safe and usable condition  AO5. ensure that machine guards are in place and are correctly fitted.  AO6. read and understand safety instructions, warning signs on the machine  AO7. ensure that all measuring equipment is within calibration due date  AO8. ensure availability of job specification from a valid source/Drawings  AO9. read and establish job requirements from the job specification document  AO10. ensure that the incoming components used are free from foreign objects, dirt or other contamination  AO11. prepare and maintain the work area as per procedure or operation specification  AO12. plan to carry out the required turning activities and the sequence of operations as per specifications  AO13. apply safe working practices and procedures at all times  AO14. obtain all the appropriate materials, cutting tools and measuring equipments required for the turning operation  AO15. confirm that the machine is ready for production  AO16. prepare for the turning activities by mounting, positioning and correctly setting a range of work holding devices and cutting tools  AO17. seek any necessary instruction/training on the operation of the machine, where required  AO18. hold components securely, without distortion  AO19. ensure that machine settings are adjusted as and when required to maintain the required accuracy  AO20. obtain the component drawings, specifications, job instructions required for the components to be machined  AO21. use and extract information from engineering drawings and related specifications (to include symbols and conventions to appropriate IS or ISO standards in relation to work undertaken)  AO22. set and adjust the machine tool speeds and feeds to achieve the component specification  AO23. mount and set the required work holding devices, work piece and cutting tools  AO24. operate the machine tool controls safely and correctly, in line with operational procedures  AO24. operate the machine tool controls safely and correctly, in line with operational procedures  AO25. control the machine in both hand and power modes for normal operations  AO26. stop the machine in both normal and emergency situations correctly, and follow right procedure for restarting after an emergency  AO27. use lathes and the accessories that consists of saddle, capstan/turret head, compound slide, tailstock, taper turning attachments, profile attachments, fixed and travelling steadies  AO28. position and secure work holding devices to the machine spindle  AO29. perform turning operations using various equipments to produce components with various features  AO30. produce components as per given quality standards  AO31. plan and work to achieve given production targets  AO32. overcome the effects of backlash in machine slides and screws  AO33. perform the technique of trial cut for checking dimensional accuracy  AO34. apply roughing and finishing cuts, considering the effect on tool life, surface finish and dimensional accuracy  AO35. use cutting fluids for different materials  AO36. use range of measuring instruments to check critical parameters  AO37. clamp the work piece in a chuck/work holding device  AO38. perform the checks to be carried out on the components before removing them from the machine, and the equipment needed for this activity  AO39. ensure that the quality control procedures are used while operating the equipment | 30 | 70 | **100** |
|  | Sub total | 30 | 70 | **100** |
| 7.CPC/N5115: Operation on Milling machine | AO1. comply with health and safety, environmental and other relevant regulations and guidelines at work  AO2. adhere to procedures and guidelines for personal protective equipment (PPE) and other relevant safety regulations while performing machining operations  **Personal protective equipment**: correctly fitting overalls; safety glasses; long hair is tied back or netted; removing any jewelry or other items that can become entangled in the machinery; covered shoes; face mask  AO3. work following laid down procedures and instructions  AO4. ensure work area is clean and safe from hazards  AO5. ensure that all tools, equipment, power tool cables, extension leads are in a safe and usable condition  AO6. ensure that all measuring instruments are within calibration due date  AO7. ensure that the components used are free from foreign objects, dirt or other contamination  AO8. ensure availability of job specification from a valid source  AO9. read and establish job requirements from the job specification document  AO10. prepare and maintain the work area as per procedure or operation specification  AO11. confirm that the machine is ready for production  AO12. seek any necessary instruction/training on the operation of the various milling machines, where appropriate  AO13. ensure that machine guards are in place and are correctly adjusted  AO14. identify different types of cutters used in horizontal and vertical milling machines  AO15. identify different parts of the vertical and horizontal milling machine  AO16. hold components securely, without distortion  AO17. ensure that machine settings are adjusted as and when required to maintain  the required accuracy and quality standards Quality  AO18. obtain the component drawings, specifications and job instructions required for the components to be machined  AO19. use and extract information from engineering drawings and related specifications to include symbols and conventions to appropriate ISO standards in relation to work undertaken  AO20. operate the machine controls in both hand and power modes  AO21. stop the machine in both normal and emergency situations, and use correct procedure for restarting after an emergency  AO22. use imperial and metric systems of measurement  AO23. perform various milling operations to produce various features on metal and non-metal components  AO24. produce components as per given quality standards  AO25. achieve given production targets  AO26. overcome the effects of backlash in machine slides and screws  AO27. apply roughing and finishing cuts considering the effect on tool life, surface finish and dimensional accuracy  AO28. apply cutting fluids with regard to a range of different materials  AO29. clamp the work piece securely and without distortion in a chuck/work holding device such as vice, V-block, clamp, angle plate, etc.  AO30. ensure that the quality control procedures are used on the equipment  AO31. use range of equipment to check critical parameters | 30 | 70 | **100** |
|  | Sub total | 30 | 70 | **100** |
| 9.CPC/N5117:Basic programming and operation on CNC Machines | AO1. comply with health and safety, environmental and other relevant regulations and guidelines at work  AO2. adhere to procedures and guidelines for personal protective equipment (PPE) and other relevant safety regulations while programming CNC machines  AO3. work following laid down procedures and instructions  AO4. ensure that machine guards are in place and are correctly adjusted  AO5. read and understand safety instructions, warning signs on the machine  AO6. ensure work area is clean and safe from hazards  AO7. ensure that all the cutting tools, measuring instruments, cables, extension leads are in a safe and usable condition  AO8. obtain job specification from a valid and approved source  AO9. read and establish job requirements from the job specification document accurately  AO10. follow job instructions, assembly drawings and laid down procedures at all times  AO11. report and rectify incorrect and inconsistent information in job specification documents as per organization procedures  AO12. use and extract information from reference charts, tables, graphs and standards  AO13. prepare the work area as per procedure or operational specification  AO14. conduct a preliminary check of the readiness of the program so that the CNC machine operates correctly  AO15. determine what operational objectives and targets need to be achieved and how best the machine needs to be programmed to achieve  AO16. extract and use information from engineering drawings and related specifications in relation to work undertaken  AO17. identify tool requirements from tooling layout and assess their suitability  AO18. identify suitable work holding or fixturing device as per the job requirement  AO19. ensure the correct and latest part-program is uploaded onto the CNC system  AO20. Use Electric Discharge Machining to hole out blind spots and also to create  hole in the die formation plate/ work piece  AO21. Setup the electrodes of the EDM machine and measure the distance between  the electrodes as mentioned in the Work Instructions  AO22. Ensure that the correct current and voltage are selected for the EDM process  AO23. Ensure that the work piece/ metal piece is carefully loaded on the EDM  machine surface tables/ work platform using manual/ automatic tools  AO24. Ensure that there is uniform flow of dielectric liquid i.e. flushing of the  dielectric liquid to remove any debris which would have collected during the  EDM process  AO25. Ensure that the machine operations are regularly monitored to detect any  malfunctions in machine operations or any out of tolerance machining  AO26. Ensure that the electrode properties like surface, dimensions, metallurgical  properties are periodically checked as per the checklist provided  AO27. Ensure that the electrodes are changed in case there is a deviation from the specifications  AO28. Prepare the CNC program with commands for tool motions, spindle motions, miscellaneous functions and tool change, in syntax corresponding to the machine and control system on which the component will be machined.  AO29. various ways to make CNC program are by writing it on paper or in a computer's text editor, or using CAM software or controllers on machine  AO30. ensure that the part program is efficient and results in minimal cycle time, with optimal cutting parameters and no unnecessary tool motions  AO31. use subprograms and canned cycles, to reduce program size and input time and avoid memory overflow on the machine  AO32. transfer the program to the machine by entering it at the console or transmitting it through a wired link or through a data transfer device  AO33. follow the correct procedures for calling up the program and dealing with any error messages or faults  AO34. handle the typical problems that can occur with the programming, loading and editing activities effectively using approved procedures  AO35. save the proven program in the appropriate storage medium – paper, computer hard disketc. - and location  AO36. complete relevant documentation as per procedure  AO37. leave the work area in a safe and tidy condition on completion of the activities  AO38. obtain appropriate equipment or tools needed as per job requirements  AO39. ensure that all measuring equipment is calibrated and approved for usage  AO40. ensure that the tools and fixtures are in usable condition(eg. free from breakage, damage, calibration, etc.)  AO41. pre-set the tooling appropriately using setting jigs/fixtures  AO42. seek any necessary instruction/training on the operation of the machine where required  AO43. mount tools in the correct positions in the tool turret or magazine  AO44. check that the tools have been mounted in positions corresponding to tool numbers in the part program  AO45. measure tool and work offset data - X and Z offsets for lathes; work offsets, length offsets and tool radius for machining centers.  AO46. ensure that the component is free of burrs, chips or other material adhering to its butting surfaces  AO47. mount the part on machine firmly in the specified work holding devices, with the appropriate clamping forces.  AO48. enter work offset and tool data on the machine – X and Z offsets, tool orientation and LOe radius for lathes; length offsets and tool radius for machining centers.  AO49. ensure that tool data has been entered in offset number corresponding to the tool offset numbers in the part program  AO50. deal with error messages and faults on the program or equipment  AO51. cut a trial part using single block run, dry run and feed and speed override  controls  AO52. edit the program and adjust tool and wear offsets to correct any dimensional errors on the part  AO53. ensure that the trial part conforms to drawing specifications in terms of dimensions, surface finishes and geometrical parameters like concentricity, parallelism, run out, etc.  AO54. hand-over the machine to the machine operator for machining the batch of parts, along with relevant instructions and documentation on periodic inspection of components, change of worn out tools  AO56. correct the tool wear offsets whenever required, based on the results of the period inspection  AO57. change worn out tools and indexable inserts whenever required  AO58. after every change of a worn out tool or insert, cut a trial part and correct any dimensional inaccuracies by adjusting the tool offsets or wear offsets  AO59. return worn out cutting tools, work holding device / fixtures / instruments / drawings to store  AO60. ensure that there is no damage to the tool/fixture while doing the prove-out  AO61. shut down the equipment to a safe condition on conclusion of the activities  AO62. deal promptly and effectively with problems within span of responsibility and control and report those that cannot be solved | 60 | 140 | **200** |
|  | Sub total | 60 | 140 | **200** |
| 10.CPC/N5105 Work effectively with others | AO1. accurately receive information and instructions from the supervisor and fellow workers, getting clarification where required  AO2. accurately pass on information to authorized persons who require it and within agreed timescale and confirm its receipt  AO3. give information to others clearly, at a pace and in a manner that helps them to understand  AO4. display helpful behavior by assisting others in performing tasks in a positive manner, where required and possible  AO5. consult with and assist others to maximize effectiveness and efficiency in carrying out tasks  AO6. display appropriate communication etiquette while working  AO7. display active listening skills while interacting with others at work  AO8. use appropriate tone, pitch and language to convey politeness, assertiveness, care and professionalism  AO9. demonstrate responsible and disciplined behaviours at the workplace | 06 | 14 | **20** |
|  | Sub total | 06 | 14 | **20** |
|  | Total | **288** | **672** | **960** |
| **Means of assessment 1:**  The assessment comprise of -Theory Assessment  Viva voce  Practical assessment | | | | |
| **Means of assessment 2:**  Pass/Fail-  The Pass mark of theory written assessment is 50% and for viva and practical assessment is 70%.  The candidate has to pass separately in Theory and Practical. | | | | |

**EVIDENCE OF LEVEL**

**Level of qualification**

|  |  |  |  |
| --- | --- | --- | --- |
| **Title /Name of Qualification/Component: Machine Operator Tool Room**  **Level:** | | | |
| **NSQF Domain** | **Outcomes of the**  **Qualification/Component** | **How the job role**  **relates to the NSQF**  **Level descriptors** | **NSQF**  **Level** |
| **Process** | The user/ individual on the job  needs to know and understand  how to:  1. Can able to Read the Job  Drawing/ Blue Print &  Dimensional Tolerances  2. Can able to Handle different  types of Hand Tools , Job  setting devices, Can able to  measure the jobs  dimensions using Different  measuring instruments like  Venire Callipers,  Micrometer, Dial Gauge,  Surface Gauge etc  3. Assembly of various type of  mould with application  Ex: Hand injection mould, Two  plate Automatic mould - Direct  Sprue injection - Single  Impression - Multi Impression -  Side Gated – Three Plate  Moulds  4. Type of polishing, different  type of polish kit and their  application  5. Can Understand How to  Operate NC Lathe, How to  Programme NC Lathe  Machine Operation,  6. Can operate & Programme a  CNC Lathe Machine Tools.  Can perform Job on CNC  Lathe Machines. Can  programme & operate on  different types of CNC Lathe Controller like Fanuc, HASS  etc  7. Can operate & Programme a  CNC Milling Machine Tools.  Can perform Job on CNC  Milling Machines. Can  programme & operate on  different types of CNC  Milling Controller like  Heidenhain, Fanuc & HASS  etc | He should capable of  making the mould in all  respect like manufacturing  the mould parts using  conventional & CNC  Machines.  He should understanding of  the mould parts, polishing  kit, Assembly Techniques,  Operation of Conventional  & CNC Machine tools, Basic  reading, writing and  communication skills, Hand  tools and Safety |  |
| **Professional**  **knowledge** | The user/ individual on the job  needs to know and understand  how to:  1. Type of Hand Tools and its  uses  2. Reading of mould assembly  drawing and details drawing  3. Able to understand different  types of moulds and their  functions  4. Able to understand the  polishing techniques and  tools  5. Able to understand  operation of Conventional &  CNC Machines | Machine Operator Tool Room should  understand the different  materials used in mould  manufacturing, tools for  machining, various  machining techniques for  mould manufacturing. He  should able to optimize the  best techniques for  manufacturing different  moulds, assembly &  polishing techniques for  different applications. |  |
| **Professional**  **skill** | The user/ individual on the job  needs to know and understand  how to:   Plan and organize the  activities/ work allocated by  mould maker and supervisor   Organize all the polishing  kits and assembly tools so  that sorting is easy on a day  to day basis   Use practical knowledge for  mould assemble   Matching of core and cavity | Machine Operator Tool Room should recall  general principles,  machining procedure and  process knowledge which  may be repetitive type of  work in the area allotted,  different types of plastics  materials, mould materials  to be used for various  applications. Thus he  should demonstrate  practical skill, routine and  repetitive in mould  manufacturing process.He  should also understand  quality concepts and use in  the area of work allotted. |  |
| **Core skill** | The user/ individual on the job needs to know and understand  how to:   Write basic level notes and  observations   Draw basic level drawings  and charts   Read documents and notes   Interpret the information  given in the documents and  notes   Read and interpret symbols  given on equipment and  work area.   Discuss task lists and job  requirements with co-workers   Effectively communicate  information to team  members | Machine Operator Tool Room should able  to communicate with their  team to clarify or schedule  the work plan/process to be  carried out with proper  clarity in all aspects and  should have arithmetic skill  to work out the required  materials, cost and time to  complete the assignment. |  |
| **Responsibility** | The responsible for making  moulds in all respect,  manufacturing the mould parts  using conventional & CNC  Machines, Organize all the  polishing kits and Assembly of  various type of mould | Machine Operator Tool Room is responsible  for the entire work in the  mould manufacturing  process. |  |

**EVIDENCE OF RECOGNITION AND PROGRESSION**

|  |
| --- |
| **What steps have been taken in the design of this or other qualifications to ensure that there is a clear path to other qualifications in this sector?**  Relevant information was collected from Industries and allied sector working in this area.  The Plastics industries are recruiting people based on the qualification acquired. Maximum of the industries accept this as qualification for selection/short listing of the individual approved by members.  **Vertical Pathway:**  The Occupational Map has been created & attached.  The Mould Making Technicians- Machinist has a clear pathway  **Horizontal Pathway:**  The individual can migrate within the Plastics mould related industries. |