

**071506T4MTM**

**MECHANICAL TECHNOLOGY AND MAINTENANCE TECHNICIAN LEVEL 6**

**ENG/OS/ME/CR/1/06**

**Perform Benchwork Operations**

**July/August 2025**



**TVET CURRICULUM DEVELOPMENT, ASSESSMENT AND CERTIFICATION COUNCIL  
(TVET CDACC)**

### **PRACTICAL ASSESSMENT**

#### **INSTRUCTIONS TO ASSESSOR:**

1. You are required to guide the candidate on duration of this assessment as per the department's practical assessment schedule for this unit as the assessment is to be done continuously during training.
2. Assess the candidate as the practical progresses observing the critical areas
3. You are required to mark the practical as the candidate performs the tasks
4. You are required to take video clips at critical points
5. Ensure the candidate has a name tag and registration code at the back and front.

## OBSERVATION AND PRODUCT CHECKLIST

|   |                                |                       |                 |
|---|--------------------------------|-----------------------|-----------------|
| <b>Candidate name</b>   |                                |                       |                 |
| <b>Candidate registration code</b>  |                                |                       |                 |
| <b>Assessor's name</b>  |                                |                       |                 |
| <b>Assessor's reg. code</b>   |                                |                       |                 |
| <b>Venue of assessment</b>  |                                |                       |                 |
| <b>Date of assessment</b>   |                                |                       |                 |
| <b>Items to be evaluated:</b> <i>Award marks as appropriately. Give a brief comment on your observation</i>   | <b>Marks available</b>         | <b>Marks obtained</b> | <b>comments</b> |
| <b>Task 1: Produced Part 1 And Part 2 (Side Block)</b>  |                                |                       |                 |
| <b>OBSERVATION CHECKLIST</b>  |                                |                       |                 |
| 1. Adhered to prescribed safety as per workplace procedures <ul style="list-style-type: none"> <li>• <b>Wore PPEs</b> <ul style="list-style-type: none"> <li>i. Safety boots</li> <li>ii. Apron/overalls</li> <li>iii. Goggles/Shield</li> </ul> </li> <li>• <b>Observed machine safety</b> <ul style="list-style-type: none"> <li>i. No speed change when machine is running</li> <li>ii. Put machine guard in place</li> <li>iii. Secured work and tool</li> </ul> </li> </ul> <p><i>(Award marks as indicated or zero)</i></p> | 1<br>1<br>1<br><br>1<br>1<br>1 |                       |                 |
| 2. Prepared operation procedures as per the operation procedure sheet checklist in  | 6                              |                       |                 |

|   |           |  |  |
|---|-----------|--|--|
| <p>appendix 2 in assessors guide.</p> <p><i>(Award <math>\frac{1}{2}</math> mark for each identified operation procedure and <math>\frac{1}{2}</math> mark for the tool as per appendix 2)</i></p>                                  |           |  |  |
| <p>3. Selected the tools and equipment for the operations to be carried out as per the prepared procedure sheet.</p> <p><i>(Award marks as indicated or zero)</i></p>   | 2         |  |  |
| <p>4. Measured and marked out dimensions on the work piece as per the operation plan</p> <p><i>(Award marks as indicated or zero)</i></p>   | 2         |  |  |
| <p>5. Mounted the work piece</p> <ul style="list-style-type: none"> <li>• Properly secured the work piece</li> </ul> <p><i>(Award marks as indicated or zero)</i></p>   | 2         |  |  |
| <p>6. Mounted cutting tool securely</p> <ul style="list-style-type: none"> <li>• selected tools as per the operation plan.</li> <li>• Aligned tool with the work piece.</li> </ul> <p><i>(Award marks as indicated or zero)</i></p> | 2<br>2    |  |  |
| <p>7. Inspected and filled in the candidate's inspection checklist appendix 1 on the candidate tool.</p> <p><i>(Award 1 mark for correctly measured dimensions)</i></p>   | 12        |  |  |
| <b>Subtotal 1</b>   | <b>34</b> |  |  |
| <b>PRODUCT CHECKLIST</b>  |           |  |  |

| Items to be evaluated: <i>please award marks as appropriate. Give a brief comment on your observation.</i>   | Marks available  | Marks obtained | comments |
|--|--|----------------|----------|
| <p>8. Prepared work piece according to drawing specifications:</p> <p><b>(All dimensions are in mm)</b></p> <p>Dimension Tolerance: <math>\pm 0.02</math></p> <p>Linear Dimension (Tol: <math>\pm 0.02</math>)</p> <ul style="list-style-type: none"> <li>• <math>36 \times 4</math></li> <li>• <math>32 \times 2</math></li> <li>• <math>12 \times 2</math></li> </ul> <p>Diameter dimensions (<math>\pm 0.02</math>)</p> <ul style="list-style-type: none"> <li>• <math>\text{Ø}10 \times 1</math></li> <li>• <math>\text{Ø}32 \times 2</math></li> <li>• <math>\text{Ø}12 \times 1</math></li> </ul> <p>Chamfer <math>2 \times 45^\circ</math></p> <p><i>(Award marks as indicated or zero)</i></p> | <p>4</p> <p>2</p> <p>2</p> <p>1</p> <p>2</p> <p>1</p> <p>2</p> |                |          |
| <p>9. Quality of thread: <math>M12 \times 2</math></p> <ul style="list-style-type: none"> <li>• Uniform profile</li> <li>• No marks on thread surface</li> </ul> <p><i>(Award marks as indicated or zero)</i></p>  | <p>2</p> <p>2</p>  |                |          |
| <p>10. Quality of filing</p> <ul style="list-style-type: none"> <li>• No burs</li> </ul>   | <p>2</p>   |                |          |
| <b>Subtotal 2</b>  | <b>20</b>  |                |          |
| <b>HOUSEKEEPING.</b>   |  |                |          |
| <p>11. Carried out housekeeping.</p> <ul style="list-style-type: none"> <li>• Removed chips from the machine table</li> </ul>  | <p>1</p>   |                |          |

|   |                                |  |  |
|---|--------------------------------|--|--|
| <ul style="list-style-type: none"> <li>• Wiped machine surface with a soft brush</li> <li>• Cleaned the work area</li> <li>• Stored the tools and accessories used in their respective storage areas</li> <li>• Oiled the machine after cleaning</li> <li>• Waste disposed in correct bin</li> </ul> <p><i>(Award marks as indicated or zero)</i></p>   | 1<br>1<br>1<br>1<br>1          |  |  |
| <b>Subtotal 3</b>   | <b>6</b>                       |  |  |
| <b>Task 2: Produced Part 3 (Base Plate)</b>   |                                |  |  |
| <b>OBSERVATION CHECKLIST</b>  |                                |  |  |
| <p>12. Adhered to prescribed safety as per workplace procedures</p> <ul style="list-style-type: none"> <li>• <b>Wore PPEs</b> <ul style="list-style-type: none"> <li>iv. Safety boots</li> <li>v. Apron/overalls</li> <li>vi. Goggles/Shield</li> </ul> </li> <li>• <b>Observed machine safety</b> <ul style="list-style-type: none"> <li>iv. No speed change when machine is running</li> <li>v. Put machine guard in place</li> <li>vi. Secured work and tool</li> </ul> </li> </ul> <p><i>(Award marks as indicated or zero)</i></p> | 1<br>1<br>1<br><br>1<br>1<br>1 |  |  |
| <p>13. Prepared operation procedures as per the operation procedure sheet checklist in appendix 2 in assessors guide.</p> <p><i>(Award <math>\frac{1}{2}</math> mark for each identified operation procedure and <math>\frac{1}{2}</math> mark for the tool as per appendix</i></p>   | 4                              |  |  |

|   |                 |                |  |
|---|-----------------|----------------|--|
| 2)  |                 |                |  |
| 14. Selected the tools and equipment for the operations to be carried out as per the prepared procedure sheet.<br><br><i>(Award marks as indicated or zero)</i>   | 3               |                |  |
| 15. Measured and marked out dimensions on the work piece as per the operation plan<br><br><i>(Award marks as indicated or zero)</i>                               | 2               |                |  |
| 16. Mounted the work piece<br>• Properly secured the work piece<br><br><i>(Award marks as indicated or zero)</i>  | 2               |                |  |
| 17. Inspected and filled in the candidate's inspection checklist appendix 1 on the candidate tool.<br><br><i>(Award 1 mark for correctly measured dimensions)</i> | 3               |                |  |
| <b>Subtotal 4</b>   | <b>20</b>       |                |  |
| <b>PRODUCT CHECKLIST</b>  |                 |                |  |
| <b>Items to be evaluated:</b> <i>please award marks as appropriate. Give a brief comment on your observation.</i>   | Marks available | Marks obtained |  |

|   |           |  |  |
|---|-----------|--|--|
| <p>18. Prepared work piece according to drawing specifications:</p> <p><b>(All dimensions are in mm)</b></p> <p>Dimension Tolerance: <math>\pm 0.02</math></p> <p>Linear Dimension (Tol: <math>\pm 0.02</math>)</p> <ul style="list-style-type: none"> <li>• <math>40 \times 1</math></li> <li>• <math>32 \times 1</math></li> <li>• <math>12 \times 1</math></li> </ul> <p>Chamfer <math>2 \times 45^\circ</math></p> <p><i>(Award marks as indicated or zero)</i></p> | 2         |  |  |
| <p>19. Quality of filing</p> <ul style="list-style-type: none"> <li>• No burs</li> </ul>  | 2         |  |  |
| <b>Subtotal 5</b>   | <b>10</b> |  |  |
| <b>HOUSEKEEPING.</b>  |           |  |  |
| <p>20. Carried out housekeeping.</p> <ul style="list-style-type: none"> <li>• Removed chips from the machine table</li> <li>• Wiped machine surface with a soft brush</li> <li>• Cleaned the work area</li> <li>• Stored the tools and accessories used in their respective storage areas</li> <li>• Oiled the machine after cleaning</li> <li>• Waste disposed in correct bin</li> </ul> <p><i>(Award marks as indicated or zero)</i></p>                              | 1         |  |  |
|   | 1         |  |  |
|   | 1         |  |  |
|   | 1         |  |  |
|   | 1         |  |  |
|   | 1         |  |  |
|   | 1         |  |  |
| <b>Subtotal 6</b>   | <b>6</b>  |  |  |
| <b>Task 3: Produced Part 4 (Hooking Bolt)</b>   |           |  |  |





|  |                            |  |  |
|--|----------------------------|--|--|
| 29. Quality of knurling<br><ul style="list-style-type: none"> <li>• Uniformity of knurls</li> </ul><br><i>(Award marks as indicated or zero)</i>   | 2                          |  |  |
| <b>Subtotal 8</b>  | <b>12</b>                  |  |  |
| <b>HOUSE KEEPING</b>   |                            |  |  |
| 30. Carried out housekeeping.<br><ul style="list-style-type: none"> <li>• Removed chips from the machine table</li> <li>• Wiped machine surface with a soft brush</li> <li>• Cleaned the work area</li> <li>• Stored the tools and accessories used in their respective storage areas</li> <li>• Oiled the machine after cleaning</li> <li>• Waste disposed in correct bin</li> </ul><br><i>(Award marks as indicated or zero)</i> | 1<br>1<br>1<br>1<br>1<br>1 |  |  |
| <b>Subtotal 9</b>  | <b>6</b>                   |  |  |
| <b>Task 4: Produced Part 5 (Hanging Pin)</b>   |                            |  |  |
| <b>OBSERVATION CHECKLIST</b>   |                            |  |  |
| 31. Adhered to prescribed safety as per workplace procedures<br><ul style="list-style-type: none"> <li>• <b>Wore PPEs</b> <ul style="list-style-type: none"> <li>• Safety boots</li> <li>• Apron/overalls</li> <li>• Goggles/Shield</li> </ul> </li> <li>• <b>Observed machine safety</b> <ul style="list-style-type: none"> <li>• No speed change when machine is running</li> </ul> </li> </ul>                                  | 1<br>1<br>1<br>1           |  |  |

|  |                   |  |  |
|--|-------------------|--|--|
| <ul style="list-style-type: none"> <li>• Put machine guard in place</li> <li>• Secured work and tool</li> </ul> <p><i>(Award marks as indicated or zero)</i></p>   | <p>1</p> <p>1</p> |  |  |
| <p>32. Prepared operation procedures as per the operation procedure sheet checklist in appendix 2 in assessors guide.</p> <p><i>(Award <math>\frac{1}{2}</math> mark for each identified operation procedure and <math>\frac{1}{2}</math> mark for the tool as per appendix 2)</i></p> | <p>2</p>          |  |  |
| <p>33. Selected the tools and equipment</p> <ul style="list-style-type: none"> <li>• Selected the tools as per operation plan</li> <li>• Set cutting speeds and welding current as per operation being performed</li> </ul> <p><i>(Award marks as indicated or zero)</i></p>           | <p>2</p> <p>2</p> |  |  |
| <p>34. Measured and marked out dimensions on the work piece as per the operation plan</p> <p><i>(Award marks as indicated or zero)</i></p>   | <p>2</p>          |  |  |
| <p>35. Mounted the work piece</p> <ul style="list-style-type: none"> <li>• Properly secured the work piece</li> </ul> <p><i>(Award marks as indicated or zero)</i></p>   | <p>2</p>          |  |  |
| <p>36. Mounted cutting tool /electrodes securely</p> <ul style="list-style-type: none"> <li>• Properly secured cutting tool/electrode</li> <li>• Aligned tool with the work piece.</li> </ul> <p><i>(Award marks as indicated or zero)</i></p>   | <p>2</p> <p>2</p> |  |  |
| <p>37. Inspected and filled in the candidate's inspection checklist appendix 1 on the</p>  |                   |  |  |

|  |                            |  |  |
|--|----------------------------|--|--|
| candidate tool.<br><i>(Award 1 mark for correctly measured dimensions)</i>   | 2                          |  |  |
| <b>Subtotal 10</b>   | <b>22</b>                  |  |  |
| <b>PRODUCT CHECKLIST</b>   |                            |  |  |
| 38. Prepared work piece according to drawing specifications:<br><b>(All dimensions are in mm)</b><br>Dimension Tolerance: $\pm 0.02$<br>Linear Dimension (Tol: $\pm 0.02$ ) <ul style="list-style-type: none"> <li>• <math>40 \times 1</math></li> </ul> Diameter <ul style="list-style-type: none"> <li>• <math>\Theta 12 \times 1</math></li> </ul> Chamfer $2 \times 45^\circ$<br><i>(Award marks as indicated or zero)</i> | 2<br>2<br>2<br>2           |  |  |
| <b>Subtotal 11</b>   | <b>8</b>                   |  |  |
| <b>HOUSE KEEPING</b>   |                            |  |  |
| 39. Carried out housekeeping. <ul style="list-style-type: none"> <li>• Removed chips from the machine table</li> <li>• Wiped machine surface with a soft brush</li> <li>• Cleaned the work area</li> <li>• Stored the tools and accessories used in their respective storage areas</li> <li>• Oiled the machine after cleaning</li> <li>• Waste disposed in correct bin</li> </ul> <i>(Award marks as indicated or zero)</i>   | 1<br>1<br>1<br>1<br>1<br>1 |  |  |
| <b>Subtotal 12</b>   | <b>6</b>                   |  |  |

| <b>Task 5: Assembled the parts</b>   |   |  |  |
|--|---|--|--|
| <b>OBSERVATION CHECKLIST</b>   |   |  |  |
| <p>40. Adhered to prescribed safety as per workplace procedures</p> <ul style="list-style-type: none"> <li>• <b>Wore PPEs</b> <ul style="list-style-type: none"> <li>• Safety boots</li> <li>• Apron/overalls</li> <li>• Goggles/Shield</li> </ul> </li> <li>• <b>Observed machine safety</b> <ul style="list-style-type: none"> <li>• No speed change when machine is running</li> <li>• No water /oil near welding machine</li> <li>• Put machine guard in place</li> <li>• No naked electrical cables</li> </ul> </li> </ul> <p><i>(Award marks as indicated or zero)</i></p> | <p>1</p> <p>1</p> <p>1</p><br><p>1</p> <p>1</p> <p>1</p> <p>1</p> |  |  |
| <p>41. Prepared operation procedures as per the operation procedure sheet checklist in appendix 2 in assessors guide.</p> <p><i>(Award <math>\frac{1}{2}</math> mark for each identified operation procedure and <math>\frac{1}{2}</math> mark for the tool as per appendix 2)</i></p>   | <p>3</p>  |  |  |
| <p>42. Selected tools and equipment as per operation plan</p> <ul style="list-style-type: none"> <li>• Selected tools as per operation plan</li> <li>• set welding current as per operation being</li> </ul>   | <p>2</p>  |  |  |

|   |                  |  |  |
|---|------------------|--|--|
| performed<br><i>(Award marks as indicated or zero)</i>  | 2                |  |  |
| 43. Measured and marked out dimensions on the work piece as per the operation plan<br><i>(Award marks as indicated or zero)</i>   | 2                |  |  |
| 44. Mounted the work piece <ul style="list-style-type: none"> <li>• Properly secured the work piece</li> </ul> <i>(Award marks as indicated or zero)</i>  | 2                |  |  |
| 45. Mounted tools and electrodes securely <ul style="list-style-type: none"> <li>• Aligned tool with the parts.</li> <li>• Mounted electrodes securely</li> </ul> <i>(Award marks as indicated or zero)</i>   | 2<br>2           |  |  |
| 46. Inspected and filled in the candidate's inspection checklist appendix 1 on the candidate tool.<br><i>(Award 1 mark for correctly measured dimensions)</i>   | 2                |  |  |
| <b>Subtotal 13</b>  | 24               |  |  |
| <b>PRODUCT CHECKLIST</b>  |                  |  |  |
| 47. Assembled as per working drawing <ul style="list-style-type: none"> <li>• Fitted: <ul style="list-style-type: none"> <li>○ Part 1 to part 3</li> <li>○ Part 2 to part 3</li> <li>○ Part 4 to part 1 and 2</li> <li>○ Part 5 to part 3</li> </ul> </li> <li>• Functionality of the shackle assembly</li> </ul> | 2<br>2<br>2<br>2 |  |  |

|  |                            |  |  |
|--|----------------------------|--|--|
| <ul style="list-style-type: none"> <li>• Proportionality of the assembly</li> <li>• Appearance</li> </ul> <p><i>(Award marks as indicated or zero)</i></p> | <p>2</p> <p>2</p> <p>2</p> |  |  |
| <b>Subtotal 14</b>   | 12                         |  |  |

**HOUSE KEEPING**

|  |   |  |  |
|--|---|--|--|
| <p>48. Carried out housekeeping.</p> <ul style="list-style-type: none"> <li>• Removed chips from the machine table</li> <li>• Wiped machine surface with a soft brush</li> <li>• Cleaned the work area</li> <li>• Stored the tools and accessories used in their respective storage areas</li> <li>• Oiled the machine after cleaning</li> <li>• Waste disposed in correct bin</li> </ul> <p><i>(Award marks as indicated or zero)</i></p> | <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> |  |  |
|--|---|--|--|

|                    |          |  |  |
|--------------------|----------|--|--|
| <b>Subtotal 15</b> | <b>6</b> |  |  |
|--------------------|----------|--|--|

|                    |            |  |  |
|--------------------|------------|--|--|
| <b>GRAND TOTAL</b> | <b>210</b> |  |  |
|--------------------|------------|--|--|

|                            |  |  |  |
|----------------------------|--|--|--|
| $\frac{X}{210} \times 100$ |  |  |  |
|----------------------------|--|--|--|

**ASSESSMENT OUTCOME**

The candidate was found to be:

Competent

Not yet Competent

*(Please tick as appropriate)*

*(The candidate is competent if the candidate obtains at least 50%)*

|                                     |              |  |
|-------------------------------------|--------------|--|
| <b>Feedback from the candidate:</b> |              |  |
| <b>Feedback to candidate:</b>       |              |  |
| <b>Candidate's signature:</b>       | <b>Date:</b> |  |
| <b>Assessor's signature:</b>        | <b>Date:</b> |  |

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**APPENDIX 2.****OPERATION PROCEDURE SHEET CHECKLIST****Task 1: PART 1 and PART 2 (Side Block)**

| S/NO. | OPERATION             | TOOL  |
|-------|-----------------------|---|
| 1.    | Marking out           | Steel rule, Centre punch, scribe, try square, divider |
| 2.    | Cutting               | Hacksaw/power saw/grinder                             |
| 3.    | Filing/grinding       | Assorted files/grinder                                |
| 4.    | Drilling              | Drill bits  |
| 5.    | Dieing                | Die set and wrench                                    |
| 6.    | Vee threading M12 X 2 | Vee thread cutting tool                               |

**Task 2: PART 3 (Base Plate)**

| S/NO. | OPERATION   | TOOL  |
|-------|-------------|---|
| 1.    | Marking out | Steel rule, Centre punch, scribe, try square, divider |
| 2.    | Cutting     | Hacksaw/power saw/grinder                             |

**Task 3: Part 4 (Hooking Bolt)**

| S/NO. | OPERATION       | TOOL  |
|-------|-----------------|---|
| 1.    | Marking out     | Steel rule, Centre punch, scribe, try square, divider |
| 2.    | Cutting         | Hacksaw/power saw/grinder                             |
| 3.    | Filing/grinding | Assorted files/grinder                                |
| 4.    | Tapping         | Taps set and wrench                                   |

|    |                       |                         |
|----|-----------------------|-------------------------|
| 5. | Knurling              | Knurling tool           |
| 6. | Chamfering            | Chamfering tool         |
| 7. | Vee threading M12 X 2 | Vee thread cutting tool |

**Task 4: Part 5 (Hanging Pin)**

| S/NO. | OPERATION       | TOOL  |
|-------|-----------------|---|
| 1.    | Marking out     | Steel rule, Centre punch, scribe, try square, divider |
| 2.    | Cutting         | Hacksaw/power saw/grinder                             |
| 3.    | Filing/grinding | Assorted files/grinder                                |