

071506T4MTM

MECHANICAL TECHNOLOGY AND MAINTENANCE TECHNICIAN LEVEL 6

ENG/OS/MEM/CR/02/6

Perform Manual Metal Arc Welding (MMAW)

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

Candidate's Name & Registration Code			
Assessors Name & Registration Code			
Venue of Assessment			
Date of Assessment			
Items to be Evaluated: <i>Please award marks as appropriate. Give a brief comment on your observation.</i>	Marks Available	Marks Obtained	Comments
COMPONENT 1			
OBSERVATION CHECKLIST			
1. Adhered to workplace safety precautions; a. Wore Personal Protective Equipment (PPE) i. Welding helmet ii. Welding apron iii. Safety boots iv. Welding gloves b. Observed machine safety i. Connected earth cable firmly ii. Laid electrical cables away from work piece <i>(Award 1 mark or zero for each)</i>	6		
2. Set up arc welding machine a. Connected the welding machine correctly to the power source b. Set the correct welding current as per the job requirement. c. Clamped the electrode correctly d. Tacked parts to be joined as per the drawing e. Switched off the welding	5		

machine correctly (Award 1 mark or zero for each)			
3. Performed welding positions as per the drawing; a. 1F b. 2F c. 3F d. 2G (Award 1 mark or zero for each)	4		
4. Inspected and filled the ' <i>candidates inspection checklist</i> ' Appendix 1 on the candidate tool. (3 ×1) (Award 1 mark for each identified measurement on appendix 1 in the candidate's tool)	3		
5. Perform housekeeping a. Cleaned weld table and floor after welding b. Returned unused materials to the store c. Returned tools for storage after welding (Award 1 mark or zero for each)	3		
SUB-TOTAL	21		
PRODUCT CHECKLIST			
Items to be Evaluated: Please award marks as appropriate. Give a brief comment on your observation.	Marks Available	Marks Obtained	Comments
6. Prepared work pieces according to task specifications:			

<p>a. Dimensions:</p> <p>Note. All dimensions are in mm</p> <p>Linear tolerance: ± 0.5 mm</p> <p>i. 90 (10 \times 1) 10</p> <p>ii. 50 (10 \times 1) 10</p> <p>iii. $\varnothing 120$ (1 \times 1) 1</p> <p>b. Squareness of work pieces</p> <p>90 \times 50 (10 \times 1) 10</p> <p>c. Prepared bevel on workpieces</p> <p>90 \times 50 (2 \times 1) 2</p> <p><i>(Award 1 mark or zero for each)</i></p>			
<p>7. Performed manual metal arc welding</p> <p>a. Open corner joint</p> <p>i. Uniform start and end</p> <p>ii. Uniform buildup of beads</p> <p>iii. No porosity</p> <p>iv. No undercut</p> <p>v. Welded at right angle</p> <p>vi. Good penetration</p> <p>vii. No Slag inclusion</p> <p><i>(Award 1 mark or zero for each)</i></p>	7		
<p>b. Double -V butt joint</p> <p>i. Flatness</p> <p>ii. Uniform start and end</p> <p>iii. Uniform buildup of beads</p> <p>iv. No porosity</p> <p>v. No Slag inclusion</p> <p>vi. No overlap</p> <p>vii. No undercut</p> <p><i>(Award 1 mark or zero for each)</i></p>	7		

<p>c. Tee fillet joint</p> <p>i. Welded at right angle ($90^0 \pm 1$)</p> <p>ii. Correct buildup of beads</p> <p>iii. Uniform start and end</p> <p>iv. No porosity</p> <p>v. No Slag inclusion</p> <p>vi. No undercut</p> <p><i>(Award 1 mark or zero for each)</i></p>	6		
<p>d. Lap joint</p> <p>i. Located 30 mm mark</p> <p>ii. Uniform start and end</p> <p>iii. Uniform buildup of beads</p> <p>iv. No porosity</p> <p>v. No undercut</p> <p>vi. Welded at right angle</p> <p>vii. Good penetration</p> <p>viii. No Slag inclusion</p> <p><i>(Award 1 marks or zero for each)</i></p>	8		
<p>8. Assembly</p> <p>a. Welded as per working drawing</p> <p>b. Welded as per weld symbols</p> <p><i>(Award 1 mark or zero for each)</i></p>	2		
SUB-TOTAL	63		
TOTAL	84		

COMPONENT 2			
OBSERVATION CHECKLIST			
<p>9. Adhered to workplace safety precautions;</p> <p>a. Wore PPE:</p> <ul style="list-style-type: none"> i. Welding helmet ii. Safety boots iii. Leather gloves iv. Apron <p>b. Observed machine safety</p> <ul style="list-style-type: none"> i. Connected earth cable firmly ii. Laid electrical cables away from work piece <p><i>(Award 1 mark or zero for each)</i></p>	6		
<p>10. Set up arc welding machine</p> <ul style="list-style-type: none"> a. Connected the welding machine correctly to the power source b. Set the correct welding current as per the job requirement. c. Tacked parts to be joined as per the drawing <p><i>(Award 1 mark or zero for each)</i></p>	3		
<p>11. Inspected and filled the '<i>candidates inspection checklist</i>' Appendix 2 on the candidate tool.</p> <p style="text-align: right;">(6 × 1)</p> <p><i>(Award 1 mark for each identified measurement on appendix 2 in the candidate's tool.)</i></p>	6		
<p>12. Performed flat weld on pipe.</p> <p><i>(Award full marks or zero)</i></p>	3		
SUB TOTAL	18		

PRODUCT CHECKLIST			
Items to be Evaluated: <i>Please award marks as appropriate. Give a brief comment on your observation.</i>	Max-marks	Actual-marks	Comment
13. Prepared work pieces according to task specifications: a. Dimensions: Note. All dimensions are in mm Linear tolerance: ± 0.5 mm i. 60 (2 × 1) ii. Ø120 (2 × 1) <i>(Award 1 mark or zero for each)</i>	4		
14. Performed manual metal arc welding a. Welded at right angle ($90^0 \pm 1$) b. Correct buildup of beads c. Uniform start and end d. No porosity e. No Slag inclusion f. No undercut <i>(Award 2 marks or zero for each)</i>	12		
15. Performed housekeeping; a. Cleaned the work station b. Disposed waste correctly c. Returned the machine and accessories to the right place <i>(Award 1 mark or zero for each)</i>	3		
SUB TOTAL	19		
TOTAL	37		

COMPONENT 3			
OBSERVATION CHECKLIST			
<p>16. Adhered to workplace safety precautions;</p> <p>a. Wore PPE:</p> <ul style="list-style-type: none"> i. Welding helmet ii. Safety boots iii. Leather gloves iv. Apron <p>b. Observed machine safety</p> <ul style="list-style-type: none"> i. Connected earth cable firmly ii. Laid electrical cables away from work piece <p><i>(Award 1 mark or zero for each)</i></p>	6		
<p>17. Set up arc welding machine</p> <p>a. Connected the welding machine correctly to the power source</p> <p>b. Set the correct welding current as per the job requirement.</p> <p>c. Tacked parts to be joined as per the drawing</p> <p><i>(Award 1 mark or zero for each)</i></p>	3		
<p>18. Inspected and filled the '<i>candidates inspection checklist</i>' Appendix 3 on the candidate tool.</p> <p><i>(Award 1 mark for each identified measurement on appendix 2 in the candidate tool.)</i> (23× 1)</p>	23		
<p>19. Performed welding positions as per the job specifications:</p> <ul style="list-style-type: none"> a. 1F b. 2G c. 3G d. 2F 	4		

<i>(Award 1 or 0 Mark for each)</i>			
20. Perform housekeeping <ul style="list-style-type: none"> a. Cleaned weld table and floor after welding b. Returned unused materials to the store c. Returned tools for storage after welding <i>(Award 1 mark or zero for each)</i>	3		
SUB-TOTAL	39		
PRODUCT CHECKLIST			
21. Prepared work pieces according to task specifications: <ul style="list-style-type: none"> a. Dimensions: Linear tolerance: ± 1 mm <p>All dimensions are in mm</p> <ul style="list-style-type: none"> i. 150 (2 \times 1) ii. 100 (8 \times 1) iii. 60 (2 \times 1) iv. 40 (2 \times 1) b. Squareness of work pieces: <ul style="list-style-type: none"> i. 150 \times 100 (2 \times 1) ii. 100 \times 50 (6 \times 1) c. Prepared bevel on work pieces <ul style="list-style-type: none"> 100 \times 50 (2 \times 1) <i>(Award 1 or 0 mark for each)</i>	2 8 2 2 2 6 2		
SUB – TOTAL	24		
Welded and inspected joints as per the drawing specifications. <ul style="list-style-type: none"> 22. Butt joints (on pipe to pipe) <ul style="list-style-type: none"> a. Alignment b. Weld quality <ul style="list-style-type: none"> i. No undercut ii. No porosity iii. No cracks 	6		

<ul style="list-style-type: none"> iv. Proper penetration v. No distortion <p><i>(Award 1 or 0 marks for each)</i></p>			
<p>23. Lap joint:</p> <ul style="list-style-type: none"> a. Alignment – overlapping distance 20 mm b. Weld quality <ul style="list-style-type: none"> i. No undercut ii. No porosity iii. No cracks iv. Proper penetration v. No distortion <p><i>(Award 1 or 0 marks for each)</i></p>	6		
<p>24. Butt joint (on the two flat bars)</p> <ul style="list-style-type: none"> a. Alignment b. Weld quality <ul style="list-style-type: none"> i. No undercut ii. No porosity iii. No cracks iv. Proper penetration v. No distortion <p><i>(Award 1 or 0 marks for each)</i></p>	6		
<p>25. Tee joint (On pipe to plate)</p> <ul style="list-style-type: none"> a. Alignment $90^\circ \pm 1$ b. Weld quality <ul style="list-style-type: none"> i. No undercut ii. No porosity iii. No cracks iv. Proper penetration v. No distortion <p><i>(Award 1 or 0 marks for each)</i></p>	6		
<p>26. Tee joint (on plate to plate)</p>			

a. Alignment $90^0 \pm 1$ b. Weld quality i. No undercut ii. No cavities iii. No cracks iv. Proper fusion v. No distortion (Award 1 or 0 marks for each)	6		
27. Assembly: a. Welded as per working drawing b. Welded as per weld symbols (Award 1 or 0 marks for each)	2		
SUBTOTAL	31		
TOTAL	95		
GRAND TOTAL Component (1 + 2+ 3)	216		
CANDIDATE GRAND SCORE ($\frac{x}{216} \times 100$)	100%		
<p>The candidate was found to be: Competent <input type="checkbox"/> Not yet competent <input type="checkbox"/> (Please tick as appropriate) (The candidate is competent if she/he gets 50% and above)</p>			
<p>Feedback from candidate: </p>			
<p>Feedback to candidate: </p>			
<p>Candidate's signature: </p>	<p>Date: </p>		
<p>Assessor's signature: -</p>	<p>Date: _____</p>		