# Knowledge Assessment

**Event 1 of 2**

## Criteria

### Unit code, name and release number

MEM05050B - Perform routine gas metal arc welding (1)

### Qualification/Course code, name and release number

MEM30305 - Certificate III in Engineering - Fabrication Trade (4)

## Student details

### Student number

### Student name

## Assessment Declaration

* This assessment is my original work and no part of it has been copied from any other source except where due acknowledgement is made.
* No part of this assessment has been written for me by any other person except where such collaboration has been authorised by the assessor concerned.
* I understand that plagiarism is the presentation of the work, idea or creation of another person as though it is your own. Plagiarism occurs when the origin of the material used is not appropriately cited. No part of this assessment is plagiarised.

### Student signature and Date

Version: *1.0*

Date created: *6 July 2018*

Date modified: *19/02/2020*

For queries, please contact:

IMRS SkillsPoint

Building B, Level 1

Hamilton Campus, 91 Parry St Newcastle West, NSW 2302

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## Assessment instructions

Table 1 Assessment instructions

| Assessment details | Instructions |
| --- | --- |
| **Assessment overview** | The objective of this assessment is to assess your knowledge as would be required to perform routine gas metal arc welding (GMAW). |
| **Assessment Event number** | 1 of 2 |
| **Instructions for this assessment** | This is a written assessment and it will be assessing you on your knowledge of the unit.  This assessment is in 3 parts:   1. Multiple choice questions 2. True or False questions 3. Short answer questions   Assessment feedback is provided at the end of this document |
| **Submission instructions** | On completion of this assessment, you are required to hand it to your trainer for marking. It is important that you keep a copy of all electronic and hardcopy assessments submitted to TAFE and complete the assessment declaration when submitting the assessment. |
| **What do I need to do to achieve a satisfactory result?** | To achieve a satisfactory result for this assessment all questions must be answered correctly. |
| **What do I need to provide?** | Writing equipment |
| **Due date/time allowed** | 1 hour |
| **Assessment feedback, review or appeals** | Appeals are addressed in accordance with [Assessment Guidelines for TAFE NSW](https://staff.tafensw.edu.au/documents/2017/11/assessment-guidelines-v02.pdf/) or TAFE NSW Student Guide. |

## Part 1: Multiple choice

Read the question and each answer carefully. Put an X in the table next to your chosen answer.

1. What would be an indication of too slow a wire feed rate when performing GMAW?

Table 1 Multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. The material being welded turns blue in colour |  |
| 1. Excessive penetration |  |
| 1. A ball of weld forming and melting to the contact tip |  |
| 1. Excessive spatter |  |

1. Which voltage and amperage settings are used to produce short arc (dip) transfer mode?

Table 2 Multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. 10 -15 volts & 40 – 180 amps |  |
| 1. 13-23 volts & 60-200 amps |  |
| 1. 21-27 volts & 200-350 amps |  |
| 1. 24-40 volts & 210-410 amps |  |

1. When GMAW on Low Carbon Steel (LCS) and using an argon and carbon dioxide shielding gas mixture the recommended flow rate is

Table 3 Multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. 20-25 ltr/min |  |
| 1. 8-12 ltr/min |  |
| 1. 14-18 ltr/min |  |
| 1. 10-25 ltr/min |  |

1. The melting point for Low Carbon Steel (LCS) is approximately

Table 4 Multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. 8150  C |  |
| 1. 60000  C |  |
| 1. 14500  C |  |
| 1. 31000  C |  |

1. What does GMAW use to prevent the atmosphere from contaminating the weld pool?

Table 5 Multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. flux |  |
| 1. shielding gas |  |
| 1. anti-spatter solution |  |
| 1. AC current |  |

1. The contact tip size must match the size of the:

Table 6 Multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. Welding machine capacity |  |
| 1. Welding wire consumable |  |
| 1. Amount of current being used |  |
| 1. Thickness of the metal being welded |  |

1. Which of the following is ***not*** a mechanical property of Low Carbon Steel (LCS).

Table 7 Multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. Corrosion resistance |  |
| 1. Tensile strength |  |
| 1. Toughness |  |
| 1. Thermal expansion |  |

1. The contact tip used in the GMAW process is made from:

Table 8 Multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. Aluminium |  |
| 1. Nylon |  |
| 1. Copper |  |
| 1. Steel |  |

1. A kinked or bent cable liner can result in:

Table 9 Multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. Poor wire feed |  |
| 1. Reduced current |  |
| 1. Increased voltage |  |
| 1. All of the above |  |

1. If the tension adjustment screw is not tight enough on the wire feed rollers it may cause the electrode wire to:

Table 10 Multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. Increase its resistance to flow of current |  |
| 1. Feed erratically (not smoothly) |  |
| 1. Loose its copper coating |  |
| 1. Reduce its ability to pick up the current at the contact tip |  |

1. The function of the flow meter is to?

Table 11 Multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. Reduce the cylinder pressure to a safe working pressure |  |
| 1. Prevent the cylinder from freezing up when using CO2 |  |
| 1. Control the flow of gas in litres per minute to the torch |  |
| 1. Indicate how much gas is remaining in the cylinder |  |

1. The effect of increasing the electrode stick out length during welding will:

Table 12 Multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. Decrease the welding current |  |
| 1. Increase the welding current |  |
| 1. No effect to the current |  |
| 1. Improve visibility of the weld pool |  |

1. The colour code for the body / shoulder / neck of a shielding gas cylinder used when GMAW Low Carbon Steel (LCS) is:

Table 13 Multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. Peacock blue / brown / crimson |  |
| 1. Crimson / black / french grey |  |
| 1. Black / peacock blue / red |  |
| 1. Peacock blue / french grey / black |  |

1. The most suitable gas or gas mixture for performing GMAW on low carbon steel (LCS) is:

Table 14 Multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. Argon |  |
| 1. Carbon dioxide |  |
| 1. Helium |  |
| 1. Argon carbon dioxide mix |  |

1. The best method to remove porosity in GMAW weld joints is by:

Table 15 Multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. Grinding |  |
| 1. Wire brushing |  |
| 1. Buffing |  |
| 1. Using pickling paste |  |

1. The most likely cause of the welding defect porosity when GMAW is carried out is?

Table 16 Multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. Using an insufficient amount of nozzle dip (anti spatter) |  |
| 1. Using a dirty cable liner |  |
| 1. Using too large a contact tip |  |
| 1. Using a blocked gas nozzle |  |

1. From the following list mark all the items which are advantages of the GMAW process:

Table 17 Multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. The speed of the process |  |
| 1. Minimal clean up after welding |  |
| 1. Easy to train welding operators in its use |  |
| 1. Ideal for use in all weather conditions |  |

1. The GMAW process:

Table 18 Multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. Uses a hydrogen shielding gas |  |
| 1. Is a semi-automatic process |  |
| 1. Uses a continuous flux covered electrode |  |
| 1. Requires the operator to wear shade 5 goggles |  |

1. GMAW is different to other welding applications in that:

Table 19 Multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. It has a concentrated welding arc |  |
| 1. It is easily transportable |  |
| 1. It is ideal for welding galvanised material |  |
| 1. It uses continuous wire feed |  |

1. When arc welding we wear a welding shield to protect us from the two (2) harmful rays that are generated. These rays are?

Table 20 Multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. X-rays and ultra-sonic |  |
| 1. Ultra-sonic and infra-red |  |
| 1. Sub-sonic and ultra-sonic |  |
| 1. Ultra-violet and infra-red |  |

1. Fumes produced during welding can be a health hazard. Fumes can be given off by:

Table 21 Multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. The parent metal |  |
| 1. Metallic coatings |  |
| 1. Paints |  |
| 1. All the above |  |

1. When performing GMAW the welder should not:

Table 22 Multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. Inspect all welding cables |  |
| 1. Always have good ventilation |  |
| 1. Wear safety glasses |  |
| 1. Place any part of the body in or across the welding circuit |  |

1. To avoid getting an electrical shock when welding the operator should:

Table 23 Multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. Check that the cables are insulated |  |
| 1. Not touch the secondary circuit cables |  |
| 1. Not set the current too high |  |
| 1. Always stand on a wet wooden floor |  |

1. Fumes that are produced when welding can be a health hazard. From the list below choose the best method to avoid breathing the toxic fumes from metals such as zinc.

Table 24 Multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. Weld outside |  |
| 1. Open the windows and doors in the workshop |  |
| 1. Use an approved respirator (breathing apparatus) |  |
| 1. Use some form of ventilation such as a fan |  |

1. From the list below mark all the items of clothing which can cause injury to the welder whilst using GMAW process.

Table 25 Multiple choice

| Answer choices | Put X next to your answers |
| --- | --- |
| 1. Frayed or ripped clothing |  |
| 1. Light weight clothing |  |
| 1. Clothing containing nylon |  |
| 1. Short sleeved shirts and shorts |  |
| 1. Disposable overalls |  |
| 1. Leather jacket |  |
| 1. Cotton overalls |  |

## Part 2: True or false

Read the question and then write **True** or **False** in the space provided.

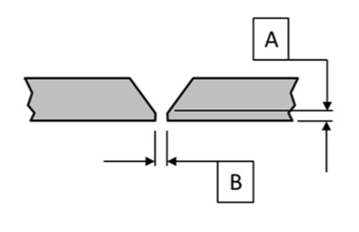
Table 3 True or false

| Question | Write *True* or *False* |
| --- | --- |
| 1. When welding in the flat (down hand) position on Low Carbon Steel (LCS) plate of 10mm thickness the wire electrode feed rate would be set approximately between 350 – 450mm per minute. |  |
| 1. Gas Metal Arc Welding (GMAW) is sometimes referred to as Metal Inert Gas (MIG) Welding. |  |
| 1. For a high-quality weld to be achieved rust must be removed prior to welding. |  |
| 1. Tensile strength is a property important to welding and fabrication. |  |
| 1. The contact tip passes the electric current required for welding to the electrode wire. |  |
| 1. Rusty wire should be wire brushed and blown clean with compressed air before welding with it. |  |
| 1. The welding wire used in GMAW should be made of similar metal composition to the parent metal being welded. |  |
| 1. The GMAW process uses a continuous feed of a solid bare wire to produce welds. |  |
| 1. Low Carbon Steel (LCS) is the most commonly welded metal using the GMAW process in the metal fabrication industry. |  |
| 1. When welding LCS sections the torch liner should be made from spring steel. |  |
| 1. A partly blocked gas nozzle can cause defects in the weld. |  |
| 1. A risk assessment is carried out at the completion of the job as part of the quality system. |  |

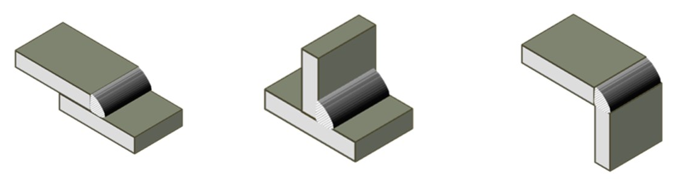
## Part 3: Short answer

Read the question carefully. Your answer should be no longer than 50 words.

1. Name two (2) diameter sizes of GMAW electrode wire
2. Name the lettered parts of the weld preparations for a single vee butt weld.



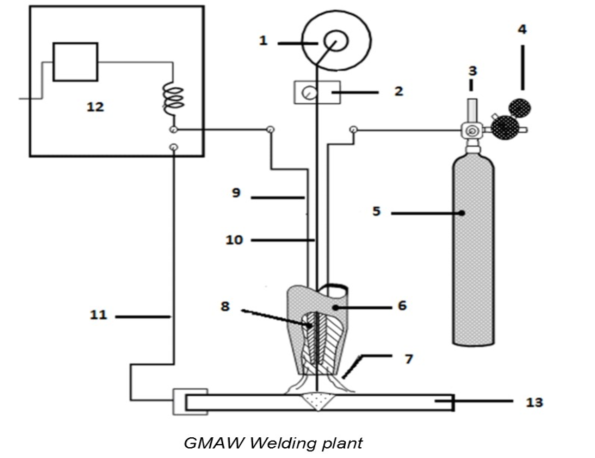
1. Name the three (3) types of weld joints shown in the diagram below.



1. Name two (2) ways of bevelling plates in preparation for welding a single vee butt weld.
2. Parts to be welded should first be cleaned. Name two (2) surface coatings or contaminants that should be removed prior to welding.
3. Name two (2) common metals that can be welded with the GMAW process.
4. Briefly describe the main functions of the gas regulator.
5. List three (3) types of weld defects that could affect the quality of the finished weld.

1. List three (3) types of safety hazards associated with the GMAW process.

1. List five (5) pieces of personal protective clothing and or equipment to be worn when welding using the GMAW process.
2. In the table below match the lettered response to the correct part number in the diagram e.g. ***Part 1 response is K Wire feed spool***



|  |  |  |
| --- | --- | --- |
| Part number from sketch | Matching letter (answer) | Possible responses |
| 1 |  | (A) Gas regulator |
| 2 |  | (B) Nozzle |
| 3 |  | (C) Welding wire |
| 4 |  | (D) Shielding |
| 5 |  | (E) Gas cylinder |
| 6 |  | (F) Contact tip |
| 7 |  | (G) Return lead |
| 8 |  | (H) Wire feed rolls |
| 9 |  | (J) Work piece |
| 10 |  | (K) Wire electrode |
| 11 |  | (L) Flow meter |
| 12 |  | (M) Electrode cable/lead |
| 13 |  | (N) Power source |

## Part 4: Assessment Feedback

*NOTE: This section* ***must*** *have the assessor signature and student signature to complete the feedback.*

### Assessment outcome

Satisfactory

Unsatisfactory

### Assessor Feedback

Was the assessment event successfully completed?

If no, was the resubmission/re-assessment successfully completed?

Was reasonable adjustment in place for this assessment event?  
*If yes, ensure it is detailed on the assessment document.*

Comments:

### Assessor name, signature and date:

### Student acknowledgement of assessment outcome

Would you like to make any comments about this assessment?

### Student name, signature and date

***NOTE: Make sure you have written your name at the bottom of each page of your submission before attaching the cover sheet and submitting to your assessor for marking.***