# Knowledge Assessment

# Trainer & Assessor Marking Guide

**Event 1 of 3**

## Criteria

### Unit code, name and release number

MEM05005B - Carry out mechanical cutting (1)

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

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

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This assessment can be found in the: [Learning Bank](https://share.tafensw.edu.au/share/access/searching.do?doc=%3Cxml%2F%3E&in=P7ac4831b-430a-4b8d-8b56-f7b32ed5b9cf&q=&type=standard&sort=rank&dr=AFTER)

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## Assessment instructions

Table 1 Assessment instructions

| Assessment details | Instructions |
| --- | --- |
| **Instructions for the trainer and assessor** | This is a written assessment and will be assessing the student on their knowledge of the unit. The assessment is closed book  This assessment is in 4 parts:   1. Multiple choice questions 2. True or False questions 3. Short answer questions 4. Assessment feedback   Adjust as required.  Model answers, sample responses or a criteria for each question are provided below.  Use these to support your judgement when determining a satisfactory result.  The student’s response to each question must contain the information indicated in this marking guide in order for their response to be correct. However, if a student provides information other than indicated below, and in the professional opinion of the assessor it is appropriate and meets the intent of the question, it may be considered correct.  The assessment feedback page must be signed by both the student and the assessor so the student displays that they have received, understood and accepted the feedback.  Complete the assessment feedback to the student and ensure you have taken a copy of the assessment prior to it being returned to the student.  Ensure the students name appears on the bottom of each page of the submitted assessment. |
| **About this marking guide** | The student’s response to each question must contain the information indicated in this marking guide in order for their response to be correct.  All questions must be answered correctly in order to satisfactorily complete this assessment event.  Assessors will need to make a judgement call as to whether each answer/response meets the criteria based upon the:   * Rules of Evidence:   + Validity – does the answer address the assessment question and does the evidence reflect the four dimensions of competency?   + Sufficiency – is the answer sufficient in terms of length and depth?   + Currency – has the work been done so recently as to be current?   + Authenticity – is this work the student’s own authentic work? * Principles of Assessment:   + Fairness – individual student’s needs are considered in the assessment process   + Flexibility – assessment is flexible to the individual student   + Validity – any assessment decision is justified, based on the evidence of performance of the student   + Reliability – evidence presented for assessment is consistently interpreted and assessment results are comparable irrespective of the assessor conducting the assessment * Dimensions of competency   + Task skills   + Task Management Skills   + Contingency Planning Skills   + Job Role Environment Skills |
| **Student must provide** | Writing equipment |
| **Assessor must provide** | Classroom suitable for conducting written assessment |
| **Time allowed** | 1 Hour |

## Part 1: Multiple choice

1. (RK 1, PC1.2) The most appropriate machine to cut 200 x 10mm flat bar is:

Table 1 Multiple choice

|  |  |
| --- | --- |
| 1. Pan Brake |  |
| 1. Punch and shears | X |
| 1. Cold saw |  |
| 1. Bench shears |  |

1. (RK 1, PC1.2) A job requires 300 pieces of 50 x 50 x 3mm LCS Angle bar cut at 450mm long. Which of the following mechanical cutting machines will be the fastest at cutting these:

Table 2 Multiple choice

|  |  |
| --- | --- |
| 1. Horizontal band saw |  |
| 1. Guillotine |  |
| 1. Punch and shears | X |
| 1. Cold cut off saw |  |

1. (RK 2, PC2.1) When cutting stainless steel, the saw blades on a cold cut off saw should have:

Table 3 Multiple choice

|  |  |
| --- | --- |
| 1. A fine tooth pitch, operate at higher speeds, use a suitable coolant |  |
| 1. A course tooth pitch, operate at lower speeds, use a suitable coolant |  |
| 1. A fine tooth pitch, operate at lower speeds, use a suitable coolant | X |
| 1. A course tooth pitch, operate at higher speeds, use a suitable coolant |  |

1. (RK 3, PC1.3, 2.3, 3.1) If we reduce the setting on the backstop of a shearing machine by 5mm:

Table 4 Multiple choice

|  |  |
| --- | --- |
| 1. The cut section behind the blade will be 5mm longer |  |
| 1. The cut section behind the blade will be 5mm shorter | X |
| 1. The cut section in front of the blade will be 5mm shorter |  |
| 1. The cut section in front of the blade will remain constant |  |

1. (RK 4): Where is information relating to the tolerance for a part being cut or manufactured?

Table 5 Multiple choice

|  |  |
| --- | --- |
| 1. Work instructions |  |
| 1. Engineering drawings | X |
| 1. Standard Operating Procedure |  |
| 1. MSDS |  |

1. (RK 6) Information with regards to machine guarding requirements can be found in:

Table 6 Multiple choice

|  |  |
| --- | --- |
| 1. Australian Standard: Safety of machinery | X |
| 1. Standard operating procedures (SOP) |  |
| 1. Work health and safety act and regulations |  |
| 1. All of the above |  |

1. (RK 6) Safe Work Australia guides can be accessed to provide information on:

Table 7 Multiple choice

|  |  |
| --- | --- |
| 1. Machine guarding |  |
| 1. Standard operating procedures |  |
| 1. Workplace hazardous substances | X |
| 1. All of the above |  |

1. (RK 6) From the list below, choose the two (2) safety documents a workplace may use to apply safety policies or procedures:

Table 8 Multiple choice

|  |  |
| --- | --- |
| 1. Industry Codes of Practice | X |
| 1. Workplace health and safety guild |  |
| 1. Work Health and Safety Act | X |
| 1. Practice codes of Industry |  |

9. (RK 6, 8) If you are not sure what the correct diameter cut off blade is required for a particular machine, the correct practice is to:

Table 9 Multiple choice

|  |  |
| --- | --- |
| 1. Refer to the SOP on the machine |  |
| 1. Ask your teacher or foreman |  |
| 1. Refer to State/Territory regulatory codes of practice standard | X |
| 1. Measure and check machine spindle size |  |

10. (RK 8) If you are not sure what PPE to wear when operating a piece of mechanical cutting equipment you should:

Table 10 Multiple choice

|  |  |
| --- | --- |
| 1. Refer to the SOP on the machine | X |
| 1. Ask your teacher or foreman |  |
| 1. Wear what you think is appropriate |  |
| 1. Ask a fellow workmate who has operated the equipment before. |  |

## Part 2: True or false

Table 1 True or false

| Question | Write *True* or *False* |
| --- | --- |
| 1. (RK 1) A universal metal working machine can notch metal | True |
| 1. (RK 2) Machine capacity is not important when shearing plate | False |
| 1. (RK 2) The abrasive cut off saw requires a coolant when cutting to keep the disc from overheating | False |
| 1. (RK 2) When cutting aluminium or soft materials on a cold cut off saw, the cutting speed is decreased to reduce clogging | False |
| 1. (RK 3) The blade width (kerf) can impact on overall length of the cut when automated cutting of multiple items | True |
| 1. (RK 3) An incorrectly tensioned Horizontal bandsaw blade can cause the finished cut to be out of square | True |
| 1. (RK 4) The term tolerances in engineering terms define the minimum and maximum size or given length | True |
| 1. (RK 5) Nesting is the process of marking out parts in groups on a piece of plate to reduce wastage. | True |
| 1. (RK 7) Eye protection is not required if mechanical cutting equipment is fitted with appropriate guarding | False |
| 1. (RK 8) SOP documents should be stored in a folder and kept in the store to protect them from damage in the workplace | False |
| 1. (RK 8) The changing of cutting tools on mechanical cutting machines is the responsibility of the supervisor only | False |

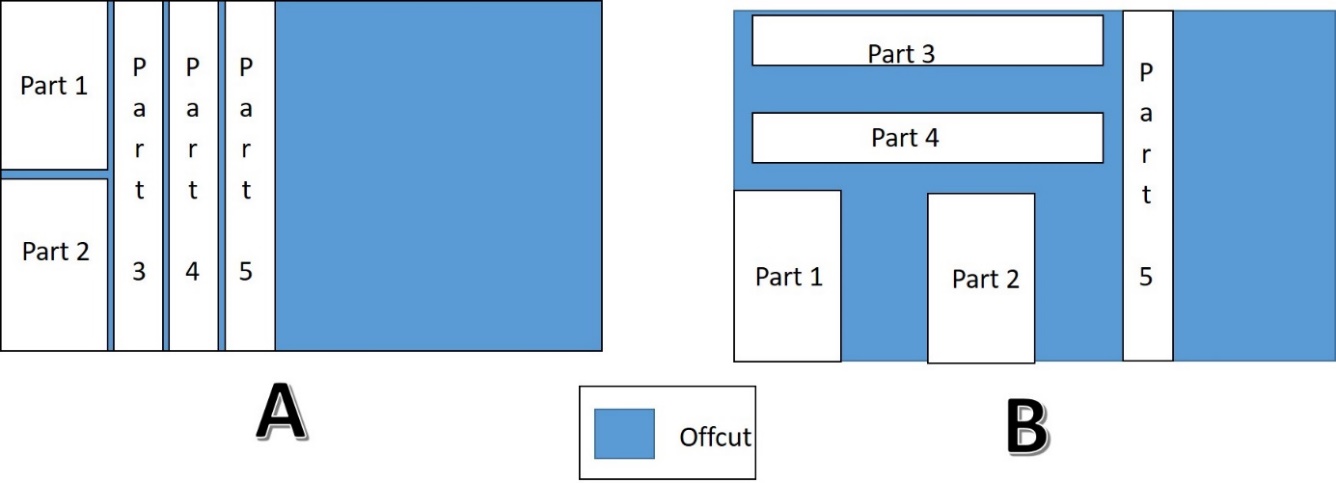
## Part 3: Short answer

1. (RK 1, PC1.2) From the cutting features listed, select the mechanical cutting machine(s) that has the ability to perform the task.

|  |  |
| --- | --- |
| Cutting features | Mark X in the box for appropriate cutting device |
| 1. Ability to cut both ferrous and non-ferrous materials | Guillotine  Punch and shear  Cold cut off saw  Abrasive saw  Horizontal bandsaw |
| 1. Can be automated to perform repetitive cut off applications | Abrasive cut off saw  Guillotine  Horizontal bandsaw  Punch and shear  Vertical bandsaw |
| 1. Can produce holes and notches in plate material | Abrasive cut off saw  Vertical bandsaw  Cold cut off saw  Punch and shear |
| 1. Cutting machine can be adjusted to produce angled cuts | Abrasive cut off saw  Cold cut off saw  Guillotine  Vertical bandsaw |

|  |  |
| --- | --- |
| Cutting features | Mark X in the box for appropriate cutting device |
| 1. Can be fitted with different cutting blades for cutting different materials | Guillotine  Punch and shear  Cold cut off saw  Abrasive saw  Horizontal bandsaw |
| 1. Uses a reciprocating cutting action | Vertical bandsaw  Power hacksaw  Horizontal bandsaw  Cold cut off saw |

1. (RK 5) The picture below is of the plates the same size, with the same parts marked out for cutting. What is the name of the method used for marking out the parts in diagram A?

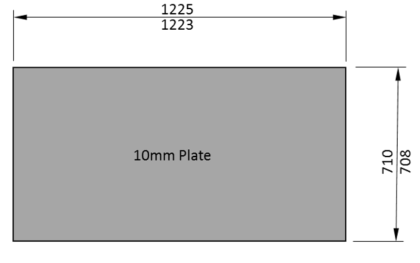


*Nesting*

1. (RK 5) From the diagram in the previous question, which method of marking out is the most economical with the least amount of wastage - Plate A or Plate B?

*Plate A*

4. (RK 4, PC1.1, 1.2, 22.3) A work order has been issued to cut the plate shown from a sheet of low carbon steel measuring 3000mm x 1500 mm. Refer to the drawing below and answer the following questions.



(a) What type of mechanical cutting device would be suitable to cut the plate to size and achieve the specified tolerance?

*Guillotine*

(b) What shearing capacity would the machine require to cut this material?

*10 mm*

(c) What sheet width capacity would the machine require to complete this task?

*1500mm*

(d) What is the tolerance for the length of the material to be cut?

*2mm*

5. (RK 8 ) When changing the blade on a mechanical cutting machine, what must you do to ensure the machine cannot be accidentally started:

*Make sure the machine is turned off, isolated and locked out.*

6. (RK 8) In the table below Mark with the letter X the information that can be found on a Standard Operation Procedure Sheet (SOP)

|  |  |
| --- | --- |
| Possible information on SOP | Mark applicable response with letter X |
| Tasks to be undertaken the may pose a risk | *X* |
| Equipment and substances used in these tasks | *X* |
| Machine manufacturers name, address and contact number |  |
| Control measures that have been built into these tasks | *X* |
| Personal Protective equipment (PPE) to be worn | *X* |
| Action to be undertaken to address safety issues that may arise while undertaking the task | *X* |
| Training or qualifications needed to undertake task | *X* |

7. (RK 8) List two (2) possible causes for an abrasive wheel to shatter whilst cutting material:

*Student response can include, but is not limited to:*

* *Defective wheel*
* *Insufficient clamping*
* *Excessive force applied whilst cutting*
* *Wheel fitted incorrectly*
* *Changing the direction of cutting blade during the cutting process*

8. (RK 7 & 8) There are 2 parts to this question to be entered in the table below :

* List 3 safe operating considerations associated with operating each mechanical cutting machine listed
* List 3 items of PPE that must be worn when operating each mechanical cutting machine

|  |  |  |
| --- | --- | --- |
| Mechanical cutting machine | Safe operation of machine | PPE required when operating machine |
| Horizontal bandsaw | *Student response can include, but is not limited to:*   * *Keep hands clear of rotating blade* * *Secure job in vice* * *Pinch points* * *Sharp edges on cut sections* * *Falling objects when parts cut* | *Student response can include, but is not limited to:*   * *Safety glasses* * *Safety footwear* * *Cotton drill clothing* * *Hearing protection* |
| Guillotine | *Student response can include, but is not limited to:*   * *Ensure parts to be cut under clamps* * *Pinch points* * *Keep fingers clear of blade and clamps* * *Sharp edges on cut material* * *Never back feed material into machine* * *Make sure no one is standing behind machine* | *Student response can include, but is not limited to:*   * *Safety glasses* * *Safety footwear* * *Cotton drill clothing* * *Hearing protection* |
| Punch and shear | *Student response can include, but is not limited to:*   * *Ensure parts to be cut under clamps* * *Pinch points* * *Keep fingers clear of blade and clamps* * *Sharp edges on cut material* * *Never back feed material into machine* * *Never operate machine if someone is standing behind it* | *Student response can include, but is not limited to:*   * *Safety glasses* * *Safety footwear* * *Cotton drill clothing* * *Hearing protection* |
| Cold cut off saw | *Student response can include, but is not limited to:*   * *Ensure parts to be cut are secure in vice* * *Pinch points* * *Keep fingers clear of rotating blade* * *Sharp edges on cut material* | *Student response can include, but is not limited to:*   * *Safety glasses* * *Safety footwear* * *Cotton drill clothing* * *Hearing protection* |
| Abrasive cut off saw | *Student response can include, but is not limited to:*   * *Ensure parts to be cut are secure in vice* * *Pinch points* * *Keep fingers clear of rotating disc* * *Sharp edges on cut material* * *Parts being cut are hot from friction* | *Student response can include, but is not limited to:*   * *Safety glasses* * *Safety footwear* * *Cotton drill clothing* * *Hearing protection* * *Dust mask or respirator* |