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Short Response (SR)

Commentary
This year’s SR subtest comprised 17 items across ten units. As students worked through each unit, they interacted with challenging and engaging stimulus material. Test developers paid careful attention to framing each item in a way that made it accessible to most students. The SR testpaper comprised units with stimulus material selected from fields as diverse as mathematics, science, history, the political and social sciences and literature.

This year’s paper was varied in its content, covering a broad range of CCEs. The different tasks included devising a type of word puzzle, calculating the surface area of a soccer ball, interpolating from a table, drawing an infographic and comparing the translations of a poem.

Model responses and commentaries on student performance
What follows is an item-by-item report that includes model responses and marking schemes, tables and graphs of the distributions of grades, and commentaries that discuss how students handled the tasks. At times, references to specific student responses are included to exemplify observations. As much as possible, model responses are actual student responses. Model responses are those that demonstrate a high level of performance and would have been awarded the highest grade.

For some items, especially the more open-ended items, responses were extremely varied. For these responses it is not possible to provide examples of the many ways students responded. The detailed, item-specific marking schemes indicate the scope of acceptable responses for different grades. Even for the more closed items the marking schemes demonstrate that different ways of perceiving ‘the solution’ were able to gain credit.

Marking schemes
The marking schemes used during the marking operation and included in this section of the Retrospective are not designed to be read in isolation. They are only one element of the marking prescription. During the marking operation markers undergo rigorous training in how to apply the marking schemes to student responses of one marking unit. The training involves careful consideration and application of the material presented by immersers.

Since all SR items are double marked, this means that a student’s response booklet will be marked by at least 10 different, independent markers. Referee marking will occur if necessary.

For organisational purposes during the marking operation, the testpaper units were grouped into five marking units. In 2013, Marking Unit 1 contained testpaper units One and Six, Marking Unit 2 contained testpaper units Two and Four, Marking Unit 3 contained testpaper units Three and Ten, Marking Unit 5 contained testpaper units Five and Eight and Marking Unit 7 contained testpaper unit Seven and Nine.
## SR 2013 summary

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<thead>
<tr>
<th>Unit</th>
<th>Item</th>
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<th>Common Curriculum Elements by unit</th>
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</thead>
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<td>One Aircraft</td>
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<td>29 Comparing, contrasting</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>30 Classifying</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>53 Observing systematically</td>
</tr>
<tr>
<td>Two Word square</td>
<td>2</td>
<td>α</td>
<td>7 Translating from one form to another</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>9 Using correct spelling, punctuation, grammar</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>10 Using vocabulary appropriate to a context</td>
</tr>
<tr>
<td>Three Soccer ball</td>
<td>3</td>
<td>φ</td>
<td>16 Calculating with or without calculators</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>φ</td>
<td>18 Approximating a numerical value</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>19 Substituting in formulae</td>
</tr>
<tr>
<td>Four Pawnbroker</td>
<td>5</td>
<td>α</td>
<td>4 Interpreting the meaning of words ...</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>26 Explaining to others</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>θ</td>
<td>30 Empathising</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>31 Interrelating ideas/themes/issues</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>43 Analysing</td>
</tr>
<tr>
<td>Five Naismith</td>
<td>7</td>
<td>φ</td>
<td>16 Calculating with or without calculators</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>φ</td>
<td>17 Estimating numerical magnitude</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>18 Approximating a numerical value</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>θ</td>
<td>26 Explaining to others</td>
</tr>
<tr>
<td>Six Exam</td>
<td>10</td>
<td>π</td>
<td>29 Comparing</td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>θ</td>
<td>33 Reaching a conclusion which is consistent with a given set of assumptions</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>34 Interpolating</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>37 Applying a progression of steps to achieve the required answer</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>45 Judging</td>
</tr>
<tr>
<td>Seven Aristotle</td>
<td>12</td>
<td>π</td>
<td>4 Interpreting the meaning of words ...</td>
</tr>
<tr>
<td></td>
<td>13</td>
<td>β</td>
<td>10 Using vocabulary appropriate to a context</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>30 Classifying</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>31 Interrelating ideas/themes/issues</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>43 Analysing</td>
</tr>
<tr>
<td>Eight Beltane</td>
<td>14</td>
<td>θ</td>
<td>16 Calculating with or without calculators</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>32 Reaching a conclusion which is necessarily true provided a given set of assumptions is true</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>44 Synthesising</td>
</tr>
<tr>
<td>Nine Akhmatova</td>
<td>15</td>
<td>β</td>
<td>26 Explaining to others</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>29 Comparing, contrasting</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>43 Analysing</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>49 Perceiving patterns</td>
</tr>
<tr>
<td>Ten Fire ants</td>
<td>16</td>
<td>φ</td>
<td>16 Calculating with or without calculators</td>
</tr>
<tr>
<td></td>
<td>17</td>
<td>β</td>
<td>35 Extrapolating</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>37 Applying a progression of steps to achieve the required answer</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>43 Analysing</td>
</tr>
</tbody>
</table>

**Note:** CCEs specific to an item are listed on the item's marking scheme. The baskets into which CCEs are grouped are shown in Appendix 3.
Unit One

The item of this unit is based on drawings of aircraft viewed from three perspectives. The following table shows the percentage of responses awarded the various grades for the item in this unit.

<table>
<thead>
<tr>
<th>Item 1</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>N</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item 1</td>
<td>90.4</td>
<td>8.5</td>
<td>0.8</td>
<td></td>
<td></td>
<td>0.1</td>
<td>0.2</td>
</tr>
</tbody>
</table>

A shaded box indicates that the grade was not available for that item.

Item 1

Model response

Beach King Air

MU-2 Marquise and Solitaire

British Aerospace 146
Commentary

Item 1 is a two-star item that tested achievement in CCEs 53 *Observing,* systematically, 29 *Comparing,* contrasti ng and 30 *Classifying.*

The item required students to identify three photographs of aircraft from the drawings of five aircraft provided. Students were required to write the correct name next to each photograph.

An A-grade response needed to correctly identify all three aircraft.

Most students were able to correctly match the graphic representation (drawing) of the aircraft with an actual photograph.

Students should approach items that rely on matching different types of visual representations strategically and pay close attention to details.
## UNIT ONE ITEM 1

### Marking Scheme

<table>
<thead>
<tr>
<th>PERFORMANCE DOMAIN</th>
<th>Marking Scheme</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>53</strong> Observing systematically</td>
<td><strong>29</strong> Comparing, contrasting</td>
</tr>
<tr>
<td><strong>30</strong> Classifying</td>
<td></td>
</tr>
</tbody>
</table>

### Marking Unit 1  1 of 4

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>N</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td>All three planes are correctly identified.</td>
<td>Two planes are correctly identified.</td>
<td>One plane is correctly identified.</td>
<td>Response is unintelligible or does not satisfy the requirements for any other grade.</td>
<td>No response has been made at any time.</td>
</tr>
</tbody>
</table>

**Note:**
A plane is correctly identified if there is sufficient information given to unambiguously indicate the plane from the list provided. Names, abbreviations, lines or other forms of identification may be used.

**Model Response:**

- Beech King Air
- MU-2 Marquise and Solitaire
- British Aerospace 146
Unit Two

The item of this unit is based on word square puzzles.
The following table shows the percentage of responses awarded the various grades for the item in this unit.

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>N</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item 2</td>
<td>67.3</td>
<td>10.5</td>
<td>9.4</td>
<td>11.4</td>
<td>1.4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A shaded box indicates that the grade was not available for that item.

Item 2

Model responses

Clues:
1. an animal often kept as a pet

2. the first number when counting

3. to obtain

```
1  D  O  G
2  O  N  E
3  G  E  T
```

Clues:
1. an animal often kept as a pet

2. Past tense of 'eat'

3. The number that comes after nine

```
1  C  A  T
2  A  T  E
3  T  E  N
```
Commentary

Item 2 is a two-star item that tested achievement in CCEs 7 Translating from one form to another, 9 Using correct spelling, punctuation, grammar, 10 Using vocabulary appropriate to a context and 36 Applying strategies to trial and test ideas and procedures.

In the introduction to this item, students were provided with a model of a 4x4 word square puzzle. Clear rules were given for the words that could be used to complete these sorts of puzzles.

The item required students to complete a 3x3 word square in the grid by providing a word that matched the given clue and then writing two other different words in the grid. Students were also required to devise an appropriate clue for each of the words they used in their word square.

The first cue instructed students to use correct spelling. The second cue reminded students that proper names, abbreviations and acronyms were not to be used. Cues are specific and students need to make sure the demands of the cues are addressed if responses are to achieve the highest grade.

An A-grade response needed to complete the grid so that the words read the same across as down, the word in position 1 was recognisable as the name of an animal and the words in positions 2 and 3 matched the clues that were devised.

Most students were able to provide appropriate words in the word square. Student responses revealed a wide variety of animals kept as pets e.g. 'fly' and 'yak'.

Students should read the introduction and cues carefully. Figure 1 and the accompanying text clearly showed and stated that the words used in the grid should be arranged to form the same words when read across and down. Some students did not provide a word square that read the same both across and down. Students should know to check their responses against the model when one is supplied.
## UNIT TWO ITEM 2

### PERFORMANCE DOMAIN

<table>
<thead>
<tr>
<th></th>
<th>7 Translating from one form to another</th>
<th>9 Using correct spelling, punctuation, grammar</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10 Using vocabulary appropriate to a context</td>
<td>36 Applying strategies to trial and test ideas and procedures</td>
</tr>
</tbody>
</table>

### A
The response provides
- a word in position 1 that is recognisable as the name of an animal
- words in positions 2 AND 3 that comply with the given rules for the word puzzle
- suitable and clearly stated clues for each of the words in positions 2 AND 3.

### B
The response provides
- a word in position 1 that is recognisable as the name of an animal
- words in positions 2 AND 3 that comply with the given rules for the word puzzle
- a suitable clue for the word being credited in position 2 OR 3.

### C
The response provides
- a word in position 1 that is recognisable as the name of an animal
- words in positions 2 AND 3 that comply with the given rules for the word puzzle
- a suitable clue for the word being credited in position 2 OR 3.

### N
Response is unintelligible or does not satisfy the requirements for any other grade.

### O
No response has been made at any time.

### Notes:
1. The rules for the word puzzle mean that
   - the letters within the grid must form the same words when read across as down
   - the words being credited must be different
   - the words that are being credited must be spelt correctly
   - proper names, abbreviations and acronyms do not gain credit
   - words that are being credited must be standard English words that can be found in a standard English dictionary.
   Words from languages other than English do not gain credit, e.g. OUI (yes), OMA (grandmother), OPA (grandfather), OLA (hello).
2. ‘Recognisable’ means that checking with a dictionary is not required.
3. A ‘suitable’ clue is one that would lead to the matching word.
4. A ‘clearly stated’ clue is unambiguous in terms of the tense of any verb used.
5. A clue may be presented as a cloze exercise as long as it would lead to the matching word.
6. If two conflicting clues are provided for a word, use the first clue to determine suitability.
UNIT TWO

ITEM 2

Model Responses:

Clue:
1. an animal often kept as a pet
2. the first number
3. to obtain

Clue:
1. Past tense of 'eat'
2. The number that comes after nine

DOG

DONE

GET

CATE

TEN
Unit Three

The items of this unit are based on information about a leather soccer ball.

The following table shows the percentage of responses awarded the various grades for the items in this unit.

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>N</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item 3</td>
<td>44</td>
<td>5.1</td>
<td>15.2</td>
<td>19.6</td>
<td>11.2</td>
<td>4.9</td>
<td></td>
</tr>
<tr>
<td>Item 4</td>
<td>32.5</td>
<td>17.9</td>
<td>3.9</td>
<td>19</td>
<td>18.2</td>
<td>8.5</td>
<td></td>
</tr>
</tbody>
</table>

A shaded box indicates that the grade was not available for that item.

Item 3

Model response

Show all steps. 

12 regular pentagons: area = \(12(1.72 \times l^2)\) 

\[= 12(1.72 \times 4.5^2) = 12 \times 34.83 = 417.96 \text{ cm}^2.\]

20 regular hexagons: area = \(20(2.6 \times l^2)\) 

\[= 20(2.6 \times 4.5^2) = 20(52.65) = 1053 \text{ cm}^2.\]

Total area of uninflated ball = 1053 + 417.96 = 1470.96 cm\(^2\).

Commentary

Item 3 is a three-star item that tested achievement in CCEs 19 Substituting in formulae, 51 Identifying shapes in two and three dimensions and 16 Calculating with or without calculators.

The item required students to calculate the surface area of a soccer ball in its uninflated state. Students were given the formulae for the area of a regular pentagon and a regular hexagon based on the side length \(l\). The pattern of a soccer ball laid out flat and the side length of the pentagons and hexagons (seam length of 4.5cm) were given in the stimulus.

The cue directed students to show all steps. This reminds students to provide all intermediate steps necessary to determine the final result, not just the result or only some of the steps.

An A-grade response needed to show that there were 12 pentagons and 20 hexagons. Students needed to calculate the areas of the pentagons and hexagons using the correct formula for the shape and then add these areas to obtain the total surface area. Each formula required the side length of 4.5 to be squared then multiplied by the relevant coefficient (for the particular shape).

Students should know the correct method of: identifying basic shapes, squaring (it is not doubling), and applying the order of operations (some students incorrectly multiplied the coefficient by \(l\) before squaring). Students should know how to use the calculator they will be bringing into the test and be familiar with its functions.
UNIT THREE ITEM 3

PERFORMANCE DOMAIN

19 Substituting in formulae
51 Identifying shapes in two and three dimensions
16 Calculating with or without calculators

Marking Scheme

A

The response shows
• that there are
  – 12 pentagons
  – 20 hexagons
• the total surface area of 1470.96 or 1471
• that no incorrect working has been used to obtain the total surface area.

B

The response shows
• that there are
  – 12 pentagons
  – 20 hexagons
• working that, except for at most one observable mechanical error, gives a consequentially correct total surface area.

C

The response shows ONE of the following:
• the area of one pentagon as 34.83 or equivalent value
• the area of all pentagons as 417.96 or equivalent value
• the area of one hexagon as 52.65 or equivalent value
• the area of all hexagons as 1053 or equivalent value
• the area of (one pentagon + one hexagon) as 87.48 or equivalent value.

D

The response shows that there are
• 12 pentagons
• 20 hexagons.

OR

The response shows correct substitution of 4.5 into an area formula.

N

Response is unintelligible or does not satisfy the requirements for any other grade.

O

No response has been made at any time.

Notes:

1. An observable mechanical error is an incorrect result to a correctly stated operation. Such errors include a single calculation error OR a transcription error.

2. Conceptual errors are not mechanical errors. The incorrect application of the power function is a conceptual error.

Model Response:

12 regular pentagons: area = \(12(1.72 \times 4.5^2) = 12 \times 34.83 = 417.96 \text{ cm}^2\).

20 regular hexagons: area = \(20(2.6 \times 4.5^2) = 20(52.65) = 1053 \text{ cm}^2\).

Total area of uninflated ball = 1053 + 417.96 = 1470.96 cm².
Item 4

Model response

Show all steps.

\[
\text{Radius of inflated ball} = \frac{69}{2 \times 3.14159} \approx 10.9817 \text{ cm.}
\]

\[
\text{Area of inflated ball} = 4 \times 3.14159 \times (10.9817)^2 = 1515.47 \approx 1515 \text{ cm}^2
\]

Commentary

Item 4 is a three-star item that tested achievement in CCEs 37 Applying a progression of steps to achieve the required answer, 19 Substituting in formulae, 16 Calculating with or without calculators and 18 Approximating a numerical value.

The item required students to determine, to the nearest square centimetre, the surface area of the inflated soccer ball given it had a circumference of 69 centimetres. Formulae for the circumference of a circle and the surface area of a sphere were provided.

The cue directed students to show all steps. Responses that provide answers only or merely some of the operations necessary to determine the final result do not satisfy the instruction to ‘show all steps’.

An A-grade response needed to show the radius of the soccer ball (determined by using the circumference of 69 cm and the formula for the circumference of a circle) substituted into the surface area formula to obtain the surface area of the inflated soccer ball rounded to the nearest whole square centimetre.

It was evident that students understood the steps required to obtain a solution; however, rearranging the circumference formula to obtain \( r = \frac{69}{2\pi} \) and then calculating the correct value for \( r \) proved to be problematic. Substituting into the surface area formula posed its own problems as the squared term was often ignored, misinterpreted as doubling or applied to the whole equation thus overriding the order-of-operations convention.

Students should know that squaring a number means to multiply it by itself rather than by two and that squaring is done before multiplying. Students should be able to round correctly and know when to round rather than truncate. Rounding a decimal number to a whole number requires considering only the digit in the first decimal place. The digits in the second or third decimal places should not be considered. The form of the final solution (e.g. to the nearest whole number) should not be used at an intermediate step.
<table>
<thead>
<tr>
<th>PERCENTAGE</th>
<th>MARKING UNIT 3  2 of 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>The response shows</td>
</tr>
<tr>
<td></td>
<td>• a value of ( r ) based on ( \frac{69}{2\pi} ) substituted into the surface area formula.</td>
</tr>
<tr>
<td></td>
<td>• the surface area as a whole number between 1514 and 1517 inclusive.</td>
</tr>
<tr>
<td></td>
<td>• that no incorrect working has been used to obtain the total surface area.</td>
</tr>
<tr>
<td>B</td>
<td>The response shows</td>
</tr>
<tr>
<td></td>
<td>• a value of ( r ) based on ( \frac{69}{2\pi} ) substituted into the surface area formula.</td>
</tr>
<tr>
<td></td>
<td>• working that, except for at most one observable mechanical error, gives a consequentially correct surface area given to the nearest whole square centimetre.</td>
</tr>
<tr>
<td>C</td>
<td>The response shows a final value for ( r ) that is between 10.98 and 11 inclusive.</td>
</tr>
<tr>
<td>D</td>
<td>The response shows the value of ( r ) as ( \frac{69}{2\pi} ).</td>
</tr>
<tr>
<td>N</td>
<td>Response is unintelligible or does not satisfy the requirements for any other grade.</td>
</tr>
<tr>
<td>O</td>
<td>No response has been made at any time.</td>
</tr>
</tbody>
</table>

**Notes:**
1. An observable mechanical error is an incorrect result to a correctly stated operation. Such errors include a single calculation error OR a transcription error.
2. Conceptual errors are not mechanical errors. The incorrect application of the power function is a conceptual error.

**Model Response:**
Radius of inflated ball = \( \frac{69}{2 \times 3.14159} \) = 10.9817 cm.
Area of inflated ball = \( 4 \times 3.14159 \times (10.9817)^2 \)
= 1515.47 = 1515 cm\(^2\).
Unit Four

The items of this unit are based on an adapted extract from a novel. The extract focuses on a pawnbroker’s shop.

The following table shows the percentage of responses awarded the various grades for the items in this unit.

<table>
<thead>
<tr>
<th>Item</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>N</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item 5</td>
<td>66</td>
<td>22.5</td>
<td></td>
<td></td>
<td></td>
<td>10.4</td>
<td>1.1</td>
</tr>
<tr>
<td>Item 6</td>
<td>3</td>
<td>10.5</td>
<td>38.6</td>
<td>29.7</td>
<td>7.5</td>
<td>6.2</td>
<td>4.6</td>
</tr>
</tbody>
</table>

A shaded box indicates that the grade was not available for that item.

Item 5

Model response

Example 1  ‘Garnet brooches … books fought for space’

Example 2  ‘a whole army of chessmen stood guard over a battlefield of rings and bracelets’

Commentary

Item 5 is a one-star item that tested achievement in CCEs 4 Interpreting the meaning of words and 30 Classifying.

The item required students to cite two examples of personification from the extract.

An A-grade response needed to cite two examples of personification. Students should know that ‘citing’ means identifying the actual words used in the extract. They should be as precise as possible to respond correctly.

The extract contains three examples of personification and the notes on the marking scheme identify core words for each of these examples. To cite, and gain credit, the response had to include or reference these core words. Personification includes both an object and an action. They could reference the words by quoting them, referring to the line number or, in the case of the object, by using an ellipsis. If an ellipsis were used the action word had to be explicitly included in the response.
## UNIT FOUR ITEM 5

### Marking Scheme

<table>
<thead>
<tr>
<th>PERFORMANCE DOMAIN</th>
<th>4 Interpreting the meaning of words …</th>
<th>30 Classifying</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A</strong></td>
<td>The response cites TWO examples of personification from the extract.</td>
<td></td>
</tr>
</tbody>
</table>
| **B**              | The response cites ONE example of personification from the extract.  --- OR ---  
The response clearly identifies TWO correct actions that demonstrate personification. |                |
| **N**              | Response is unintelligible or does not satisfy the requirements for any other grade. |                |
| **O**              | No response has been made at any time. |                |

### Notes:

1. There are three creditable examples of personification in the extract. The underlining indicates core words, with dotted underlining meaning that at least one of these objects must be listed in the core words. Italics indicates the nature of the action that demonstrated personification.
   - a wooden *sign* hung on rusty chains, *refusing* to swing in the breeze
   - Garnet brooches and silver watches, china cups and vases, *pen holders, teaspoons and books, fought* for space on the shelves
   - A whole army of *chessmen stood guard* over a battlefield

2. To cite an example of personification, the response must include/reference the core words (object/s and action) which are underlined in the relevant statement in Note 1. An ellipsis may be used to refer to the object/s but not to the action. Minor transcription errors in citing the object/s or action can be accepted, as can a different tense or accurate paraphrasing of the action.

3. Where more than one sentence is included in an example, only the contribution from the first sentence should be considered.

4. A correct action that demonstrates personification may be clearly identified using simply the word in Italics (Note 1) or an acceptable variation, such as a different tense or accurate paraphrasing.

### Model Response:

- ‘Garnet brooches … books fought for space’
- ‘a whole army of chessmen stood guard over a battlefield of rings and bracelets’
Item 6

Model response

Refer to specific examples to support your explanation. Don’t overlook the effect of the last two sentences.

The extract gives the reader a depressed feeling and evokes the emotion of sadness through the extensive use of literary techniques and descriptive language. The language used to describe the pawnbroker’s shop paints the shop in a negative, dark and depressing way. The ‘grubby windows’, and the ‘rusty chains’ are examples of descriptive language used in the extract to evoke the emotion of sadness. As well as this, the simile ‘lives pinned like butterflies behind glass’ is used to create the sense of hopelessness and worthlessness.

The constant use of personification, bringing the once treasured objects to life, continuously evokes sadness throughout the extract, especially when the ‘disparate’ objects are seen ‘fighting’ for space on the shelves. In the final few lines, the unanswered questions being asked leave the reader in a truly depressed state, unable to solve the ethical dilemmas which the poor must face every day to get food.

Overall, the extract uses a wide variety of descriptive language in order to convey the emotion of sadness in the reader. All this ‘degradation’ is on public display in a blatant way and this is what ‘celebration’ refers to but this ironic use of ‘celebration’ makes me feel really depressed and sad.
Commentary

Item 6 is a four-star item that tested achievement in CCEs 43 Analysing, 31 Interrelating ideas/themes/issues, 28 Empathising and 26 Explaining to others.

The item required students to identify an emotional response a reader might have to the extract and to explain how various techniques and the language employed in the extract evoke this emotional response.

The first cue directed students to refer to specific examples to support the explanation. The plural in the cue identifies that more than one example is required. The second cue informed students that the last two lines should not be overlooked. This meant that to be awarded the highest grade, responses had to discuss the effect created in the last two sentences.

An A-grade response needed to state an emotion a reader might experience, explain how the deliberate use of two techniques and one language choice evoked the stated emotion and make meaning of the last two lines in a way that was consistent with the stated emotion by using a technique or a language choice.

The explanation had to link to the emotion either explicitly, e.g. ‘and this makes the reader feel sad’ or implicitly when the explanation was clearly aligned with the emotion. Various emotions were creditable; however, any emotion discussed had to be consistent with a reasonable reading of the text. Students should read the words of the stem carefully. Some students provided an emotional response the author, pawnbroker or a customer might have, instead of the response a reader may have had.

Cues should not be ignored as they assist in directing the student to meet important requirements. Specific examples were required as this was the first step to discussing language and techniques. It was essential to discuss the last two lines as they acted as the culmination of the extract. The use of the words ‘celebration’ and ‘degradation’ had to be explored.
## UNIT FOUR ITEM 6

### PERFORMANCE DOMAIN

<table>
<thead>
<tr>
<th>Analysis</th>
<th>Empathising</th>
</tr>
</thead>
<tbody>
<tr>
<td>43</td>
<td>28</td>
</tr>
</tbody>
</table>

#### Marking Scheme

<table>
<thead>
<tr>
<th>Grade</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>The response • states an emotion a reader might experience • explains how the deliberate use of TWO techniques and ONE language choice evokes the stated emotion • makes meaning of the last two sentences in a way that is consistent with the stated emotion by using a technique or a language choice.</td>
</tr>
<tr>
<td>B</td>
<td>The response • states an emotion a reader might experience • explains how the use of ONE technique and ONE language choice evokes the stated emotion • shows some understanding of the meaning of the last two sentences by using a technique or a language choice.</td>
</tr>
<tr>
<td>C</td>
<td>The response • states an emotion a reader might experience • explains how the deliberate use of TWO techniques and ONE language choice evokes the stated emotion.</td>
</tr>
<tr>
<td>D</td>
<td>The response • states an emotion a reader might experience • explains how the use of ONE technique/language choice evokes the stated emotion • attempts to deal with the last two sentences. OR The response • states an emotion a reader might experience • explains how the use of ONE technique/language choice evokes the stated emotion.</td>
</tr>
<tr>
<td>E</td>
<td>The response • states an emotion a reader might experience • explains how the deliberate use of TWO techniques and ONE language choice evokes the stated emotion.</td>
</tr>
<tr>
<td>N</td>
<td>Response is unintelligible or does not satisfy the requirements for any other grade.</td>
</tr>
<tr>
<td>O</td>
<td>No response has been made at any time.</td>
</tr>
</tbody>
</table>

#### Notes:

1. To be creditable, the emotional response must not be inconsistent with a reasonable reading of the extract.
2. An emotion is defined as an affective state of consciousness in which sadness, regret or similar is experienced. An emotion differs from cognitive and volitional states of consciousness, which are collectively referred to in this marking scheme as a ‘state of mind’.

#### Model Response:

The extract gives the reader a depressed feeling and evokes the emotion of sadness through the extensive use of literary techniques and descriptive language. The language used to describe the pawnbroker’s shop paints the shop in a negative, dark and depressing way. The ‘grubby windows’, and the ‘rusty chains’ are examples of descriptive language used in the extract to evoke the emotion of sadness. As well as this, the simile ‘lives pinned like butterflies behind glass’ is used to create the sense of hopelessness and worthlessness. The constant use of personification, bringing the once treasured objects to life, continuously evoke sadness throughout the extract, especially when the ‘disparate’ objects are seen ‘fighting’ for space on the shelves. In the final few lines, the unanswered questions being asked leave the reader in a truly depressed state, unable to solve the ethical dilemmas which the poor must face every day to get food. Overall, the extract uses a wide variety of descriptive language in order to convey the emotion of sadness in the reader. All this ‘degradation’ is on public display in a blatant way and this is what ‘celebration’ refers to but this ironic use of ‘celebration’ makes me feel really depressed and sad.
Unit Five

The items of this unit are based on two ways of predicting with some accuracy how much time it will take to walk the length of an unfamiliar track.

The following table shows the percentage of responses awarded the various grades for the items in this unit.

<table>
<thead>
<tr>
<th>Item</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>N</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item 7</td>
<td>22</td>
<td>12.6</td>
<td>25.7</td>
<td>6.3</td>
<td>28.5</td>
<td>4.9</td>
<td></td>
</tr>
<tr>
<td>Item 8</td>
<td>17.4</td>
<td>11.6</td>
<td>25.3</td>
<td>20.7</td>
<td>17.7</td>
<td>7.3</td>
<td></td>
</tr>
<tr>
<td>Item 9</td>
<td>3.9</td>
<td>4.9</td>
<td>14.6</td>
<td>18.5</td>
<td>42.4</td>
<td>15.7</td>
<td></td>
</tr>
</tbody>
</table>

A shaded box indicates that the grade was not available for that item.

Item 7

Model response

Show all calculations.

- \(3 \text{ miles} = 3 \times 5280 = 15840 \text{ feet} = 15840 \times 30.48 = 482803.2 \text{ cm}\)

\(= 4.828 \text{ km}. \) So 3 miles is slightly less than 5 km, but reasonably close.

- \(2000 \text{ feet} = 2000 \times 30.48 = 60960 \text{ cm} = 609.6 \text{ m}.\)

So 2000 feet is slightly more than 600 m, but again reasonably close.

Commentary

Item 7 is a three-star item that tested achievement in CCEs 17 Estimating numerical magnitude, 45 Judging, 16 Calculating with or without calculators and 29 Comparing.

The item required students to confirm that the metric version of Naismith’s rule of thumb (used to determine hiking time on an unfamiliar track) was a reasonable approximation of the original imperial version of the same rule.

The cue directed students to show all calculations. This cue specifically identified that in their responses students had to support the confirmation with calculations.

An A-grade response needed to convert at least one of the along-the-track distances (imperial or metric) so that both distances were in the same units and do similarly for the ascent distances. In the response it was necessary to flag that the two different versions of Naismith’s rule were reasonably equivalent.

Problems that inhibited the responses from achieving the highest grade included converting the distances given in each version into related, rather than the same units, such as, one distance in centimetres and the other in kilometres. This did not allow an ‘effortless’ comparison, as a reader of the response would have to execute further calculations to be satisfied that the distances were a reasonable approximation. In other responses the calculations were not shown e.g. 600 metres = 1968.5 feet and therefore the directions given in the cue were not followed. At times, students only confirmed the match between the track distances and overlooked the ascent distances or vice versa.

If they are asked as part of an item to confirm, prove or verify a claim students should be aware they are expected to agree with the claim rather than refute it. The values that some students calculated contradicted the stated claim and rather than searching for their errors they simply concluded that the claim must be untrue.
### UNIT FIVE ITEM 7

**PERFORMANCE DOMAIN**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>17</td>
<td>Estimating numerical magnitude</td>
</tr>
<tr>
<td>16</td>
<td>Calculating with or without calculators</td>
</tr>
<tr>
<td>29</td>
<td>Comparing</td>
</tr>
</tbody>
</table>

**Marking Scheme**

- **A**
  - The response shows
    - correct operations with correct results that allow an effortless comparison of the metric and imperial ‘track’ lengths.
    - correct operations with correct results that allow an effortless comparison of the metric and imperial ‘ascent’ lengths.
  - The reasonableness of the approximation is confirmed.

- **B**
  - The response provides, allowing for at most one observable mechanical error
    - correct process that allows an effortless comparison of the metric and imperial ‘track’ lengths.
    - correct process that allows an effortless comparison of the metric and imperial ‘ascent’ lengths.
  - The response provides
    - correct process with correct result that allows a comparison of the metric and imperial ‘track’ lengths.
    - OR
    - correct process with correct result that allows a comparison of the metric and imperial ‘ascent’ lengths.

- **C**
  - The response provides
    - correct process with correct result that allows a comparison of the metric and imperial ‘track’ lengths.
    - correct process with correct result that allows a comparison of the metric and imperial ‘ascent’ lengths.
    - correct operations that would have allowed, if error/s had not been made, a comparison of the metric and imperial ‘track’ lengths.
    - correct operations that would have allowed, if error/s had not been made, a comparison of the metric and imperial ‘ascent’ lengths.

- **D**
  - The response shows
    - correct operations that would have allowed, if error/s had not been made, a comparison of the metric and imperial ‘track’ lengths.
    - correct operations that would have allowed, if error/s had not been made, a comparison of the metric and imperial ‘ascent’ lengths.

- **N**
  - Response is unintelligible or does not satisfy the requirements for any other grade.

- **O**
  - No response has been made at any time.

**Notes:**

1. An ‘effortless’ comparison means that the quantities being compared are in the same units and a reader does not have to infer which unit of measurement is intended.
2. Confirmation can be recognised by unambiguously used words or markings or by known mathematical symbols which mean ‘approximately equal to’. Confirmation is only required at the A grade.
3. A mechanical error can include an error such as a transcription error, an incorrect result of a correctly stated operation, inappropriate rounding, a mistake when changing cm ↔ m ↔ km. The error must be observable.
4. Correct operation with correct result involves showing appropriate (to the method) numbers and operators leading to a correct result, e.g. $3 \times 5280 \times 30.48 = 482803.2$
   Correct operation (that would have allowed … ) involves showing appropriate (to the method) numbers and operators, e.g. $600 \times 0.3048$.
   Correct process with correct result does not require the operation to be explicitly shown, e.g. 3 miles = 15840 feet.
   For the purposes of this marking scheme, the explicit operations to change cm ↔ m ↔ km do not need to be shown.
UNIT FIVE ITEM 7

Model Response:

1. 
   3 miles = $3 \times 5280 = 15840$ feet
   $= 15840 \times 30.48 = 482803.2$ cm
   $= 4.83$ km.
   So 3 miles is slightly less than 5 km, but reasonably close.

2000 feet = $2000 \times 30.48 = 60960$ cm
   $= 609.6$ m.
   So 2000 feet is slightly more than 600 m, but again reasonably close.

2. 
   5 km = $5000 \div 0.3048 = 16404.2$ feet
   $= 16404.2 \div 5280 = 3.107$ miles.
   So 5 km = 3 miles.

600 m = $60000 \div 30.48 = 1968.5$ feet.
   So 600 m = 2000 feet.

3. 
   1 mile = $5280$ feet = $5280 \div 30.48 = 160934.4$ cm
   $160934.4 = 1.61$ km

   In the metric version 5 km takes 1 hour (60 mins) so 1 km takes $60 \div 5 = 12$ mins
   1.61 km will take $1.61 \times 12 = 19.32$ mins

   In the imperial version 3 miles takes 60 mins so 1 mile would take $60 \div 3 = 20$ mins.

   Times for along the track are nearly the same for metric and imperial

2000 feet = $2000 \times 0.3048 = 609.6$ m

   In the metric version 600 m takes 60 mins so 1 m takes $60 \div 600 = 0.1$ min

   609.6 m will take $609.6 \times 0.1 = 60.96$ mins

   So the 600 m and the 2000 feet both take approximately 60 mins.

   Metric version of Naismith's rule is a reasonable approximation to the imperial version.
Item 8

Model response

<table>
<thead>
<tr>
<th>Show all steps.</th>
<th>Number of hours = ( \frac{6.1}{5} + \frac{645}{600} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Round your answer to the nearest ten minutes.</td>
<td>= 2.295 hours</td>
</tr>
</tbody>
</table>

\[ \text{total time} = 2 \text{ hours 17.7 minutes} \]
\[ \approx 2 \text{ hours 20 minutes.} \]

Commentary

Item 8 is a three-star item that tested achievement in CCEs 16 Calculating with or without calculators, 18 Approximating a numerical value and 37 Applying a progression of steps to achieve the required answer.

The item required students to determine the time it would take to hike from Ronny Creek to the top of Cradle Mountain — a distance of 6.1 kilometres which ascends from 900 m above sea level to 1545 m.

The first cue directed students to show all steps. An additional cue instructed them to round the answer to the nearest ten minutes. It is important to address all clues in a response. An A-grade response needed to show calculation and the total time for the hike and present it, appropriately rounded, as either 140 minutes or as 2 hours and 20 minutes. The response needed to show the correct operations performed to arrive at this result (show all steps).

To calculate the ‘track time’ and the ‘ascent’ time students needed to know proportion/ratio concepts. For the ‘ascent’ time students had to first find the correct ascent distance. This is where some students had difficulty, adding the heights instead of subtracting them to find the actual distance ascended during the hike. It is interesting to note also that some students tried to use Pythagoras’ theorem even though the stem clearly instructed them to use the metric version of Naismith’s rule. Careful reading of the stem when attending to the given task is important.

Students should know how to convert the decimal parts of answers to correct sub-units, in this case, part of an hour to minutes. A number of responses provided the total time for the hike as 2.295 hours, but in attending to the second cue they incorrectly converted the 0.295 hours to 30 minutes. Practice with other similar time conversions (e.g. converting 2.3 years to years and months or converting 5.35 minutes to minutes and seconds) may also be useful.
## UNIT FIVE ITEM 8

### Marking Scheme

<table>
<thead>
<tr>
<th>PERFORMANCE DOMAIN</th>
<th>16 Calculating with or without calculators</th>
<th>18 Approximating a numerical value</th>
<th>37 Applying a progression of steps to achieve the required answer</th>
</tr>
</thead>
</table>

#### A
- The response provides
  - correct operation/s for ‘track’ time
  - correct ascent distance
  - correct operation/s for ‘ascent’ time
  - total hike time of 140 minutes or 2 hours 20 minutes.
- No incorrect working is used to arrive at the answer.

#### B
- The response provides, allowing for at most one observable mechanical error
  - a process for ‘track’ time
  - ascent distance
  - a process for ‘ascent’ time
  - a total hike time in minutes or hours and minutes.
- Consequential correctness is required following the error.

#### C
- The response provides for ‘track’ time
  - correct process with a correct result.
  - No incorrect working is used to arrive at the answer.
  
- OR

- The response provides for ‘ascent’ time
  - correct process with a correct result.
  - No incorrect working is used to arrive at the answer.

#### D
- The response provides 645 as the ascent distance.

#### N
- Response is unintelligible or does not satisfy the requirements for any other grade.

#### O
- No response has been made at any time.

### Model Response:

Number of hours = $\frac{6.1}{5} + \frac{645}{600} = 2.295$ hours

Total time = 2 hours 17.7 mins = 2 hours 20 minutes.

### Notes:

1. A mechanical error can include an error such as a transcription error, an incorrect result of a correctly stated operation, inappropriate rounding. The error must be observable.

2. Errors not considered to be mechanical are
   - the use of 900 m or 1545 m or 2445 m as the ascent distance
   - converting decimal hours to hours and minutes incorrectly, e.g. 1.22 hrs becoming 1 hr 22 mins or 2.295 hrs = 2 hrs 30 mins.
   - Responses that include one of these types of errors may gain credit at the C grade where ‘at most one observable error’ is allowed.

3. Where only an estimation of a time is presented this does not satisfy the requirement of providing a ‘correct process’ and a response that depends merely on estimation gains no credit, e.g. 6.1 km takes about 1 hr 10 mins or 6.1 km = 1 hr 10 mins gains no credit; however 6.1 km = 1.22 hrs = 1 hr 10 mins does show a ‘correct process with correct result’.

---

### Marking Unit 5 3 of 6
Item 9

Model response

Clearly present your reasoning referring to values from the table.

\[
\begin{align*}
3 \text{ hours and 40 minutes} & = \frac{40}{60} = \frac{2}{3} \text{ of way between 3 and 4 hours} \\
\text{in the 3—4 hour columns} & \quad 5\frac{1}{4} \text{ hours is in unfit [4\frac{1}{4}—5\frac{3}{4}]} \\
\text{or very unfit [4\frac{3}{4}—6\frac{1}{2}]} & \quad \text{time range for unfit is } 1\frac{1}{2} \text{ hours and } \frac{2}{3} \times 1\frac{1}{2} \text{ hours } = 1 \text{ hour} \\
4\frac{1}{4} + 1 & = 5\frac{1}{4} \text{ hours exactly} \\
\text{Therefore the fitness level can only be unfit.}
\end{align*}
\]

Commentary

Item 9 is a three-star item that tested achievement in CCEs 34 Interpolating, 33 Reaching a conclusion which is consistent with a given set of assumptions, 26 Explaining to others and 17 Estimating numerical magnitude.

The item required students to use data from the table to determine the fitness level of hikers on which the travel guide based its recommendations for the hike.

The cue directed students to clearly present reasoning referring to values from the table. Cues of this nature demand that students work with and specify values given in the table and to also explain clearly what they are doing.

An A-grade response needed to show that consideration should be limited to the 3 and 4 hour columns in the table. A search for appropriate time ranges further limited the focus to the ‘unfit’ and ‘very unfit’ rows. Calculations could then be used to show how 40 minutes is two-thirds of an hour and that two-thirds of the time into the range stated for the ‘unfit’ category gave exactly the time quoted by the travel guide. This proved that ‘unfit’ was the only possible level of fitness used by the travel guide. This method was not the only acceptable method of interpolating within the table. Other less explicitly mathematical methods were acceptable, but generally the discussion around the method failed to clearly demonstrate that ‘very unfit’ was eliminated as a possibility.

For an item requiring interpretation and use of information from within a table or graph students are advised to take some time to make sense of the structure of the table or graph and any units used in them before analysing the contents with respect to the specific task.
## UNIT FIVE ITEM 9

### Marking Scheme

#### PERFORMANCE DOMAIN

| Marking Unit 5 4 of 6 |

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>N</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td>The response presents an appropriate interpolative process that establishes 'unfit' as the only possible level. Supporting explanation/working is clear and complete.</td>
<td>The response presents an appropriate interpolative process that leads to 'unfit' as the suggested level. Supporting explanations/working are provided.</td>
<td>The response indicates, with some reasoning related to 5¼, that the part of the table to be considered is within the blue area shown below. No incorrect reasoning is employed in the part of the response gaining credit.</td>
<td>The response indicates that the part of the table to be considered is within the blue area shown below. No incorrect reasoning is employed in the part of the response gaining credit.</td>
<td>Response is unintelligible or does not satisfy the requirements for any other grade.</td>
<td>No response has been made at any time.</td>
</tr>
</tbody>
</table>

### Model Response:

3 hrs and 40 minutes is \(\frac{40}{60} = \frac{2}{3}\) of way between 3 and 4 hours.

5¼ hours is in unfit [4¾—5¾] or very unfit [4¾—6½] in the 3—4 hour columns. Time range for unfit is 1 ½ hours and \(\frac{2}{3} \times 1\frac{1}{2} = 1\) hour. 

4¼ + 1 = 5¼ hours exactly.

Therefore the fitness level can only be unfit.

### Notes:

1. An ‘appropriate interpolative process’ is based on correctly and logically determining where the 5¼ hours best fits in the table and hence selecting the best possible match from the given levels of fitness.

2. ‘Establishes’ indicates that there is no doubt remaining that any other fitness level could be possible.

3. ‘Clear and complete’ explanation/working includes all information to allow a reader to follow and understand the reasoning presented (because of the explanation not because the reader already knows something about the problem). Essential features of the process are described and satisfy the reader that only ‘unfit’ is the best possible match and any other options should be dismissed. The reader does not need to make any assumptions or inferences.
Unit Six

The items of this unit are based on an extract outlining how a student used time in long paper and pencil exams.

The following table shows the percentage of responses awarded the various grades for the items in this unit.

<table>
<thead>
<tr>
<th>Item</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>N</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item 10</td>
<td>12.5</td>
<td>7.8</td>
<td>33.1</td>
<td>10.3</td>
<td>22.7</td>
<td>13.6</td>
<td></td>
</tr>
<tr>
<td>Item 11</td>
<td>10.1</td>
<td>21.8</td>
<td>33.3</td>
<td>26.7</td>
<td>4</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

A shaded box indicates that the grade was not available for that item.

Item 10

Model responses

![Exam Sitting Strategy](image)

![Student manages exam time](image)

**Commentary**

Item 10 is a three-star item that tested achievement in CCEs 20 Setting out/presenting/arranging/displaying, 52 Searching and locating ... information and 7 Translating from one form to another.

This item defined infographics as visual representations that accurately and concisely display information and enable quick and meaningful interpretation by a viewer. This item required presentation of an infographic that displays how the student in the extract uses their time during a three-hour examination.

An A-grade response needed to present an infographic that displayed the four time periods the student divided the exam block into and indicate the activity the student engaged in during each time period. Responses were required to be drawn to scale, use minimal text and be appropriately titled. An A-grade response provided information that was not inconsistent with a reasonable reading of the extract and interpreting the infographic did not require reading the extract for clarification.

Some students did not identify the four time periods allocated by the student for the exam and simply drew a picture showing the student sitting at a desk, ankles crossed and writing. The stem clearly outlined the three 'must haves' for the infographic presented. It was disappointing to see well-considered infographics that lacked titles or used too many words or did not show the four time periods drawn to scale. When a list of requirements is given, students should check their response to make sure all have been attended to.

Students should know that they need to examine stems carefully, look for the key terms and address all requirements outlined in the stem and cues.
### UNIT SIX ITEM 10

#### Performance Domain

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
</table>
| The response presents an infographic that includes all four key aspects and
  • is drawn to scale
  • uses minimal text
  • is appropriately titled. | The response presents an infographic that includes all four key aspects and
  • is drawn to scale
  and one of either
  • uses minimal text
  or
  • is appropriately titled. | The response presents an infographic that includes three key aspects and one of
  • is drawn to scale
  • uses minimal text
  • is appropriately titled. | The response presents a summary that includes two key aspects. |

The infographic provides information that is not inconsistent with a reasonable reading of the extract.

Interpretation of the infographic does not require reading the extract for clarification.

#### Notes:

1. The information required in the infographic is what the student did during the exam, not why or how she did it.
2. The ‘key aspects’ are:
   • time periods representing (2 hours and 3 x 20 minutes)
   • writing initial responses
   • returning to uncomfortable questions/rewriting responses
   • crucial phrasing/number of marks/checking responses.
3. ‘Drawn to scale’ refers to the diagram appearing to the eye to be drawn in the correct proportion.
4. ‘Minimal text’ refers to the response using a small number of words to present information.
5. An appropriate title refers to time and/or examinations.
UNIT SIX

ITEM 10

Exam Sitting Strategy

Model Response 1:

Model Response 2:

Marking Scheme

Key

Student manages exam time

Initial response

Uncomfortable questions

Phrasing questions

Spare time

Set quickly

Checking

Contactable

1 hour

2 hour

3 hour
Item 11

Model response

Strategy 1  She allows 20 minutes to return to uncomfortable questions. This is effective because she can now focus on the harder questions, rework her responses and possibly gain more credit. The weakness is that she may have interrupted her train of thought and could take more time getting back into the question, which would mean she had less time for other questions.

Strategy 2  She restricts herself to giving four responses for a four-mark question. This would improve her results because she does not run the risk of losing marks for extra incorrect information. On the other hand, the answer may require more than four facts so she is running the risk of missing out on some marks.

Commentary

Item 11 is a three-star item that tested achievement in CCEs 42 Criticising and 43 Analysing.

The item required students to consider the extract presented, choose two of the student’s exam-sitting strategies and discuss, for each, how its use might improve her exam result or be detrimental to her exam result.

An A-grade response needed to provide two exam-sitting strategies from the passage and offer clear explanations to specify how the consequence of using each of the strategies could be linked to improved and diminished exam performance.

Unfortunately, a common error made by students was not addressing all requirements, i.e. they gave either a consequence for ‘improvement’ or a consequence for ‘diminished performance’, not both as the stem required.
## UNIT SIX ITEM 11

### Marking Scheme

#### PERFORMANCE DOMAIN

<table>
<thead>
<tr>
<th></th>
<th>42 Criticising</th>
<th>43 Analysing</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>The response provides two different exam-sitting strategies from the extract. For each strategy an explanation is given regarding how it might • improve her exam result • be detrimental to her exam result.</td>
<td>The response provides one exam-sitting strategy from the extract. For that strategy an explanation is given regarding how it might • improve her exam result • be detrimental to her exam result. AND For the other strategy an explanation is given regarding how it might either • improve her exam result OR • be detrimental to her exam result.</td>
</tr>
<tr>
<td>B</td>
<td>The response provides two different exam-sitting strategies from the extract. For one strategy an explanation is given regarding how it might • improve her exam result • be detrimental to her exam result.</td>
<td>The response provides two different exam-sitting strategies from the extract. For each strategy an explanation is given regarding how it might either • improve her exam result OR • be detrimental to her exam result.</td>
</tr>
<tr>
<td>C</td>
<td>The response provides one exam-sitting strategy from the extract. For that strategy an explanation is given regarding how it might • improve her exam result • be detrimental to her exam result.</td>
<td>The response provides one exam-sitting strategy from the extract. For that strategy an explanation is given regarding how it might either • improve her exam result OR • be detrimental to her exam result.</td>
</tr>
<tr>
<td>D</td>
<td>The response provides one exam-sitting strategy from the extract. For that strategy an explanation is given regarding how it might either • improve her exam result OR • be detrimental to her exam result.</td>
<td>The response provides two different exam-sitting strategies from the extract.</td>
</tr>
</tbody>
</table>

#### Notes:

1. An ‘explanation’ gives a consequence of the strategy, links this consequence to improved or diminished exam performance and requires no inference on the reader’s behalf.
2. Explanations must not be inconsistent with a reasonable reading of the extract.
3. A strategy can be explicitly stated or implied from the explanation.
4. A strategy may be stated in general terms, e.g. paced exams like a marathon could be expressed as time management.

#### Model Response:

Strategy 1. She allows 20 minutes to return to uncomfortable questions. This is effective because she can now focus on the harder questions, rework her responses and possibly gain more credit. The weakness is that she may have interrupted her train of thought and could take more time getting back into the question, which would mean she had less time for other questions.

Strategy 2. She restricts herself to giving four responses for a four-mark question. This would improve her results because she does not run the risk of losing marks for extra incorrect information. On the other hand, the answer may require more than four facts so she is running the risk of missing out on some marks.
Unit Seven

The items of this unit are based on Aristotle's view on virtues.

The following table shows the percentage of responses awarded the various grades for the items in this unit.

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>N</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item 12</td>
<td>1.1</td>
<td>29.7</td>
<td>51.6</td>
<td></td>
<td>15.3</td>
<td>2.5</td>
<td></td>
</tr>
<tr>
<td>Item 13</td>
<td>5.7</td>
<td>20.4</td>
<td>34.6</td>
<td>24.2</td>
<td>12.9</td>
<td>2.2</td>
<td></td>
</tr>
</tbody>
</table>

A shaded box indicates that the grade was not available for that item.

Item 12

Model response

| Responses formed by attaching prefixes or suffixes to words in the table will gain no credit. |
|-----------------------------------------------|-----------------------------------------------|
| courage                                      | bravery                                      |
| cantankerousness                             | contrariness                                |
| extravagance                                 | over-indulgence                             |

Commentary

Item 12 is a two-star item that tested achievement in CCEs 10 Using vocabulary appropriate to a context and 4 Interpreting the meaning of words.

This unit introduced Aristotle’s view of virtues. Aristotle saw virtues as being on a continuum between the vices of deficiency and excess. Students were provided with an example that explained how to use a context to understand the vices with respect to the virtue. A table containing several virtues with their corresponding vices of deficiency and excess was given.

The item required students to provide a synonym for each of three given words from the table. The synonym had to act as a substitute for the word as it was used in the table.

The cue informed students that adding prefixes or suffixes to words in the table would gain no credit. Cues act as guides to students and give further instructions on how to respond and sometimes how not to respond. They should be heeded.

An A-grade response needed to provide a synonym for each of the three words given. A synonym is a word that has a significantly similar meaning as another word, so that one can be substituted for the other in a given context. To be interchangeable, the two words must use the same part of speech. All the words in the table are nouns, so a synonym for any of them should also be a noun.

The example in the introduction described how the context and the notions of deficit and excess could be applied to a given virtue, however, few students recognised the importance of context, providing words such as ‘evil’ for cantankerousness, and ‘luxury’ for extravagance. Another error was that students failed to give the synonyms in noun form.

It appears that not all students read the introduction to units or recognise the significance of a given example. It is important that all the stimulus material, including the introduction, is studied carefully and any examples or models provided are used to check the response is fully and correctly completed.
### UNIT SEVEN ITEM 12

**PERFORMANCE DOMAIN**

### Marking Scheme

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>N</th>
<th>O</th>
</tr>
</thead>
</table>
| For each of the three given words the response provides a synonym. | For two of the three given words the response provides:  
• a synonym  
or  
• a word which if in noun form would be a synonym. | For one of the three given words the response provides:  
• a synonym  
or  
• a word which if in noun form would be a synonym. | Response is unintelligible or does not satisfy the requirements for any other grade. | No response has been made at any time. |

**Notes:**

1. A ‘synonym’ or a ‘word which if in noun form would be a synonym’ has the following characteristics:  
   — it may contain at most three words or consist of normally hyphenated words  
   — it is consistent with the context established in the table.  
2. Words formed by attaching prefixes or suffixes to words or parts of words in the table do not attract credit.  
3. Accept, without penalty, a proposed synonym that is misspelt provided it is clear what word is meant.

**Model Response:**

- courage: bravery
- cantankerousness: contrariness
- extravagance: over-indulgence
**Item 13**

**Model response**

<table>
<thead>
<tr>
<th>Vice of deficiency</th>
<th>Virtue</th>
<th>Vice of excess</th>
</tr>
</thead>
<tbody>
<tr>
<td>I.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>suspiciousness</td>
<td>trust</td>
<td>gullibility</td>
</tr>
<tr>
<td>II.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>impertinence</td>
<td>respect</td>
<td>servility</td>
</tr>
<tr>
<td>inflexibility</td>
<td>tolerance</td>
<td>indulgence</td>
</tr>
<tr>
<td>meekness</td>
<td>confidence</td>
<td>belligerence</td>
</tr>
</tbody>
</table>

**Commentary**

Item 13 is a three-star item that tested achievement in CCEs 30 *Classifying*, 4 *Interpreting the meaning of words* and 31 *Interrelating ideas/themes/issues*.

The item had two parts. In part I, the students were required to write ‘gullibility’ and ‘suspiciousness’ in their correct positions in the table i.e. as the vice of deficiency or the vice of excess of the virtue ‘trust’. Part II required them to arrange the remaining given words in their appropriate positions in the rest of the table.

An A-grade response identified ‘suspiciousness’ as the vice of deficiency and ‘gullibility’ as the vice of excess and completed three correct rows of the table. This was a closed item and the correct placements of the words are shown in the marking scheme.

Many students correctly classified ‘gullibility’ and ‘suspiciousness’ and managed to identify and correctly place the three virtues, tolerance, confidence and respect, in the centre column.

Success in this item required a reasonable vocabulary and the continued use of the notions established by the example that ‘too little’ of a virtue constituted the vice of deficiency and ‘too much’ of a virtue was the excess.

Students should be encouraged to read widely to enhance their vocabulary and to make good use of examples provided in a unit. They should revisit the stimulus material as different items in the unit are encountered.
### UNIT SEVEN ITEM 13

#### PERFORMANCE DOMAIN

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>N</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td>The response provides for part I • suspiciousness — gullibility for part II • three correct rows.</td>
<td>The response provides for part I • suspiciousness — gullibility for part II • the three virtues correctly classified • three correctly classified pairs.</td>
<td>The response provides for part I • suspiciousness — gullibility for part II • the three virtues correctly classified.</td>
<td>The response provides for part I • suspiciousness — gullibility.</td>
<td>Response is unintelligible or does not satisfy the requirements for any other grade.</td>
<td>No response has been made at any time.</td>
</tr>
</tbody>
</table>

#### Notes:

1. A row is correct when the words in the table are in the appropriate order, reading left to right. The order in which the rows appear is not important.

2. The three virtues are correctly classified when ‘respect, confidence, tolerance’ are in the Virtue (middle) column of the table. The order in which the words appear is not important.

3. A correctly classified pair consists of a virtue and one of its vices listed in the table in the appropriate order, reading left to right, e.g. ‘impertinence, respect’ would be one correctly classified pair; however ‘respect, impertinence’ would not be correctly classified. Another correctly classified pair would be ‘confidence, belligerence’.

4. There is no penalty for incorrect transcription, i.e. a slight misspelling, provided it is clear which word was intended.

### Model Response:

<table>
<thead>
<tr>
<th>Vice of deficiency</th>
<th>Virtue</th>
<th>Vice of excess</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. suspiciousness</td>
<td>trust</td>
<td>gullibility</td>
</tr>
<tr>
<td>II. impertinence</td>
<td>respect</td>
<td>servility</td>
</tr>
<tr>
<td>inflexibility</td>
<td>tolerance</td>
<td>indulgence</td>
</tr>
<tr>
<td>meekness</td>
<td>confidence</td>
<td>belligerence</td>
</tr>
</tbody>
</table>
Unit Eight

The item of this unit concerns a monument constructed in the ancient mythical city of Beltane.

The following table shows the percentage of responses awarded the various grades for the item in this unit.

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>N</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item 14</td>
<td>14.9</td>
<td>15.8</td>
<td>12.4</td>
<td>16.3</td>
<td>15.9</td>
<td>20</td>
<td>4.8</td>
</tr>
</tbody>
</table>

**Item 14**

*Model response*

<table>
<thead>
<tr>
<th>Show all steps.</th>
<th>Clearly state what is being calculated at each step.</th>
</tr>
</thead>
<tbody>
<tr>
<td>working daie in niads is $\frac{18}{2} - \frac{16}{8} = 7$ niads</td>
<td>time worked by whole gang is $6 \times 7 = 42$ niads</td>
</tr>
<tr>
<td>number of blocks the gang laid in one daie is $42 \times 135 = 5670$ blocks/daie</td>
<td>number of daies for total blocks to be laid is $\frac{42000}{5670} = 7.4$ daies</td>
</tr>
<tr>
<td>Since Haoine is not a work daie and the construction began on Luan it will</td>
<td>finish part way through Ardaoin of the second weke of construction.</td>
</tr>
</tbody>
</table>

**Commentary**

Item 14 is a four-star item that tested achievement in CCEs 32 *Reaching a conclusion which is necessarily true provided a given set of assumptions is true, 44 Synthesising* and 16 *Calculating with or without calculators*.

The item required students to determine on which *daie* of which *weke* a monument would be completed in the mythical city of Beltane. The stimulus material included information relating to time within the mythical city.

The cues instructed students to show all steps and clearly state what is being calculated at each step. It is important to remember that detailed cues of this nature guide students to design their response so that it is capable of earning most credit.

An A-grade response needed to provide a set of steps that correctly and explicitly used all the data-pieces: total blocks (42 000), *niads* in a full work *daie* (7), workers in a team (6), blocks per worker per *niad* (135) and *daies* in a work *weke* (4) with Haoine being the *daie* not worked. An A-grade response also provided reasoning (statements of what was being calculated) for the progression of steps and used no incorrect working to arrive at the final result. The response needed to show clear evidence that completion of the monument occurred on Ardaoin of the second *weke*.

This particular item required students to have a thorough understanding of rates and to be able to manage combining several rates in a meaningful manner. Students who attended to the cue to state what was being calculated at each step handled the complexity of unfamiliar names of units and conversion factors well. This cue was deliberately provided to assist students to manage the progression of steps.
### UNIT EIGHT ITEM 14

#### PERFORMANCE DOMAIN

| 32 | Reaching a conclusion which is necessarily true provided a given set of assumptions is true |
| 44 | Synthesising |
| 16 | Calculating with or without calculators |

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>N</th>
<th>O</th>
</tr>
</thead>
</table>
| The response provides
- a set of steps that correctly and explicitly uses all the data-pieces
- clear evidence that indicates that completion occurs on Ardaoin of the second week
- reasoning for the progression of steps.
No incorrect working is used to obtain the final result. | The response provides
- a set of steps that correctly uses all the data-pieces allowing for the assumed use of at most one of the data-pieces
- clear evidence that indicates that completion occurs on Ardaoin
- reasoning for the progression of steps.
No incorrect working is used to obtain the final result. | The response shows four of the data-pieces used meaningfully.
Some indication of what is being calculated is provided. | The response shows three of the data-pieces used meaningfully.
Some indication of what is being calculated is provided. | The response shows three of the data-pieces used meaningfully.

--- OR ---

The response shows that the niads in a full work daie is 7.
No incorrect working is used to arrive at the 7. | Response is unintelligible
or does not satisfy the requirements for any other grade. | No response has been made at any time. |

#### Notes

1. The data-pieces are:
   - (i) total blocks — 42000
   - (ii) niads in a full work daie — 7
   - (iii) workers in a team — 6
   - (iv) blocks per worker per niad — 135
   - (v) daies in a work weke (Haone being the daie not worked) — 4.

2. ‘Allowing for the assumed use of at most one of the data-pieces’ refers to a data-piece that has not been explicitly shown in the working but has been used correctly as evidenced by seeing the result of its use.

3. Provides ‘reasoning’ means that very few inferences need be made by the reader to follow and understand the progression of steps.

4. A ‘mechanical error’ can include an error such as a transcription error, an incorrect result to a correctly stated operation, inappropriate rounding. The error must be observable.

5. Whether the use of a data-piece is ‘necessary’ is contingent upon the mechanical error’s consequences.

6. To ascertain whether one of the data-pieces has been ‘used meaningfully’, check for
   - evidence of progression towards the solution, i.e. the operation in which the data-pieces are used are connected
   - evidence of correctness in terms of operations in which a data-piece is used (consequential meaningfulness/correctness is dependent on the effects of any errors that may have been made).
UNIT EIGHT ITEM 14

Model Response

1. working daie in niads is \( \frac{18}{2} - \frac{16}{8} = 7 \) niads

   time worked by whole gang is \( 6 \times 7 = 42 \) niads

   number of blocks the gang laid in one daie is \( 42 \times 135 = 5670 \) blocks/daie

   number of daies for total blocks to be laid is \( \frac{42000}{5670} = 7.4 \) daies

   since Haoine is not a work daie and the construction began on Luan it will finish part way through Ardaoin of the second weke of construction.

2. If 135 blocks were laid per niad and there were 42000 blocks in total, \( 42000 \div 135 = 311.11 \) so it took 311.11 niads to complete

   They worked 7 niads a daie 311.11 \( \div 7 = 44.44 \) daies

   If it took 44.44 daies to complete — so this is 11.11 wekes because 4 working daies per weke

   One person takes 11.11 wekes so for the team of 6 that would be 1.85 wekes (slightly less than 2 wekes) so will finish on Ardaoin.

3. \( 42000 \div 6 = 7000 \) blocks/worker

   7 niads in a working daie

   \( 135 \times 7 = 945 \) blocks/daie/worker

   \( \frac{7000}{945} = 7.4 \) daies so complete on 8th daie

   wk 1 L, M, C, A
   2 L, M, C, A

   completed on Ardaoin.
Item 15

Model response

Whilst these two translations both follow the same pattern of likes and dislikes (being translations of the same poem), differences in word choice by the two translators have resulted in the translations painting very different pictures of the people in the poem.

The first translation paints the man as an eccentric soul. He is ‘enchanted’ by things that seem old-fashioned and faded, or from the past. His eccentricity is further established with the vehemence of his dislikes — he ‘couldn’t stand’ crying children (described as ‘brats’). Despite these eccentricities, the wife is sure of his devotion to her — he was ‘tied’, or bound to her.

The second translation has none of this colour. He ‘loved’ the same things, but matter-of-factly. The maps were not ‘faded’, they were ‘worn out’, like the marriage. ‘Crying children’ were not appreciated but nor were they ‘brats’. The marriage lacked passion — they were ‘married’, not ‘tied’.
Item 15 is a four-star item that tested achievement in CCEs 49 Perceiving patterns, 29 Comparing, contrasting, 43 Analysing and 26 Explaining to others.

The item required students to consider two translations of a Russian poem. Students were then required to explore how the different tones of the translations were established and how they influenced their (the student’s) perceptions of the poem’s characters and their relationship.

The cue instructed students to refer to examples of similarity and difference.

An A-grade response needed to identify different perceptions of the two people and their relationship. Three points of comparison had to be provided, each from a different section of the poem. Examples from both translations had to be included. The examples were required to be specific references from the text that clearly exemplified the specific point of comparison. The third element of the A-grade response was that it indicated the effect of the points of comparison with respect to the perceptions. At some stage in the response an example of both a similarity and a difference had to be provided.

Students were required to say how the different tones influenced perceptions of the two people and their relationship. They did not necessarily see the relationship as seeming ‘happier’ in one translation than in the other and different students attached different significance to various parts of the translations.

The translations were short and similarly structured which assisted in the exploration demanded in the stem. All parts of the translations needed to be investigated to comply with the ‘explore how’ instruction. Some students focused only on the first part of the stem and wrote an entire response about tone, without then relating this to the difference in their perceptions of the two people and their relationship. Students should read the stem carefully, and respond to all aspects of it. Those students who did not give an example of a similarity did not attend to the cue.
### UNIT NINE  
**ITEM 15**  

**PERFORMANCE DOMAIN**  

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>49</td>
<td>43</td>
<td>49</td>
<td>29</td>
<td>26</td>
</tr>
<tr>
<td>Perceiving patterns</td>
<td>Analysing</td>
<td>Perceiving patterns</td>
<td>Comparing, contrasting</td>
<td>Explaining to others</td>
</tr>
</tbody>
</table>

**Marking Scheme**

**Marking Unit 7**  
3 of 3

**Notes:**

1. **Perceptions of the two people and their relationship** can be perceptions of one or both of the people or of their relationship.
2. The corresponding sentences of the translations are viewed as separate sections as shown below.

**Translation 1**

<table>
<thead>
<tr>
<th>Three things enchanted him:</th>
<th>He loved these three things</th>
</tr>
</thead>
<tbody>
<tr>
<td>white peacocks, evensong, and faded maps of America.</td>
<td>White peacocks, evening songs, and worn-out maps of America.</td>
</tr>
</tbody>
</table>

**Translation 2**

<table>
<thead>
<tr>
<th>He couldn’t stand bawling brats, or raspberry jam with his tea, or womanish hysteria.</th>
<th>No crying of children, no raspberry tea, no women’s hysterics…</th>
</tr>
</thead>
<tbody>
<tr>
<td>… And he was tied to me.</td>
<td>I was married to him.</td>
</tr>
</tbody>
</table>

**Model Response:**

Whilst these two translations both follow the same pattern of likes and dislikes (being translations of the same poem), differences in word choice by the two translators have resulted in the translations painting very different pictures of the people in the poem.

The first translation paints the man as an eccentric soul. He is ‘enchanted’ by things that seem old-fashioned and faded, or from the past. His eccentricity is further established with the vehemence of his dislikes — he ‘couldn’t stand’ crying children (described as ‘brats’). Despite these eccentricities, the wife is sure of his devotion to her — he was ‘tied’, or bound to her.

The second translation has none of this colour. He ‘loved’ the same things, but matter-of-factly. The maps were not ‘faded’, they were ‘worn out’, like the marriage. ‘Crying children’ were not appreciated but nor were they ‘brats’. The marriage lacked passion — they were ‘married’, not ‘tied’.

**Response is unintelligible or does not satisfy the requirements for any other grade.**

**No response has been made at any time.**
Unit Ten

The items of this unit are based on information about a fire ant eradication program.

The following table shows the percentage of responses awarded the various grades for the items in this unit.

<table>
<thead>
<tr>
<th>Item</th>
<th>Grade</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>N</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td></td>
<td>11</td>
<td>2.9</td>
<td>9.2</td>
<td>57.5</td>
<td></td>
<td>13.8</td>
<td>5.6</td>
</tr>
<tr>
<td>17</td>
<td></td>
<td>7</td>
<td>14.9</td>
<td>23.3</td>
<td>13.7</td>
<td>10.6</td>
<td>13.8</td>
<td>16.6</td>
</tr>
</tbody>
</table>

A shaded box indicates that the grade was not available for that item.

Item 16

Model response

I. $150 \text{ kg} \div 2 \frac{\text{kg}}{\text{ha}} = 75 \text{ ha}$

II. Using $2 \frac{\text{kg}}{\text{ha}}$, active ingredient $\frac{5}{1000} \times 2 \text{ kg} = 0.01 \text{ kg in 1 ha}$

So $0.01 \text{ kg in 1 ha}$

$= 10 \text{ g in 10 000 m}^2$

$= 0.001 \text{ g in 1 m}^2$

$0.001 \text{ g/m}^2$ active ingredient is applied

Commentary

Item 16 is a three-star item that tested achievement in CCEs 16 Calculating with or without calculators and 37 Applying a progression of steps to achieve the required answer.

The item had two parts. In part I, the item required students to determine the maximum area in hectares that could be baited from a single helicopter flight carrying 150 kg of bait and in part II, students had to calculate, in grams per square metre, how much of the active ingredient would be applied at the coverage rate of 2 kg/ha.

An A-grade response needed to show that 75 hectares could be baited in one flight and that the active ingredient coverage rate was 0.001 g/m². No incorrect working could be used. Students needed to correctly interpret the proportion ‘5 parts active ingredient to 1000 parts bait’, as the fraction $\frac{5}{1000}$ and then use it as that fraction of the amount of bait in g/m².

Metric conversion factors are assumed knowledge, but unit conversions were often done incorrectly leading to answers that were out by various factors of 10. Care must be taken when applying metric conversion factors — a common error was the accidental ‘loss’ or ‘gain’ of a zero during calculations.

Students should identify the units they are using in each line of a response so they can easily identify when they have attained the required unit. Some students merely added g/m² to a number obtained through some calculation without considering whether this was indeed the actual unit.
UNIT TEN ITEM 16

Marking Scheme

16 Calculating with or without calculators

37 Applying a progression of steps to achieve the required answer

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
</table>
| The response shows for part I
• 75
for part II
• 0.001
• no incorrect working. | The response shows for part I
• 75
for part II
• 10 g/ha or an equivalent value.
| The response shows for part I
• 75 or 750000 m²
for part II
• 0.01 g/m².
• no incorrect working. | The response shows for part I
• 75 or 750000 m².
• 0.2 g/m².
| The response shows for part II
• 0.000995 g/m² or an equivalent value.
• the correctly calculated rate of active ingredient applied, clearly based on the answer to part I. | The response shows for part II
• 0.2 g/m².
| OR| OR| OR|
| The response shows for part I
• 75 or 750000 m²
for part II
• 0.01 g/m².
• no incorrect working. | The response shows for part I
• 75 or 750000 m².
• 0.2 g/m².
| The response shows for part II
• 0.000995 g/m² or an equivalent value.
• the correctly calculated rate of active ingredient applied, clearly based on the answer to part I. | The response shows for part II
• 0.2 g/m².

Model Response:

I. 150 kg + 2 kg/ha = 75 ha

II. Using 2 kg/ha, active ingredient \[ \frac{5}{1000} \times 2 \text{ kg} = 0.01 \text{ kg in 1 hectare} \]

So \[ 0.01 \text{ kg in 1 hectare} = 10 \text{ g in 10000 m}^2 \]

\[ = 0.001 \text{ g in 1 m}^2 \]

\[ \therefore 0.001 \text{ g/m}^2 \text{ active ingredient is applied.} \]
Item 17

Model response

Refer to data from the graph and the table.  
Active ingredient Y quickly kills off the number of nests per plot in the first 3 weeks, but the number of nests recovers to finish at about 6 nests per plot.

You may use point form.  
For active ingredient X, the number of nests per plot increases initially and then decreases to about 12 nests per plot after the 24 weeks.

Therefore active ingredient Y is more effective.

The table shows that the LD$_{50}$ for X is more than 34.6 g per kg and for Y it is 1.73 g per kg.

This means that Y is more toxic as non-target animals need to ingest less Y per kg to kill 50% of them. The half-life for Y is 4 times that for X which indicates that Y will stay in the environment longer than X and could cause harm to non-target species.

Commentary

Item 17 is a four-star item that tested achievement in CCEs 43 Analysing, 45 Judging and 35 Extrapolating.

The item required students to discuss for each of the active ingredients X and Y the effectiveness of, and the possible risks involved, with its use in a fire ant eradication program.

The first cue directed students to refer to specific data from the graph and the table. A second cue allowed point form to be used. This cue encourages students to save time by writing in point form, if they prefer, as opposed to writing in sentences as stated in instruction 8 on the cover of the SR testpaper.

An A-grade response needed to reference the graph, providing ‘point-at-able’ information about effectiveness of X and Y. It also had to make relevant observations, about X and Y, dealing with two of the following factors: mode of action, amount applied, LD$_{50}$ or half-life and giving valid consequences of the observations made with respect to the risks of these active ingredients. A-grade responses did not include incorrect statements.

Two distinct types of response were evident. There were those where observations about the ingredients X and Y were listed separately, with pros and cons given and conclusions drawn and then those where students dealt with the relative effectiveness of X and Y first and then turned their thoughts to the risks involved in using each ingredient. Both types of response were equally creditable depending on their content.

Responses to this type of item should provide details and matching relevant conclusions.

Students should read the stimulus material closely and ensure that their responses meet all the requirements of the stem.
**UNIT TEN ITEM 17**

**PERFORMANCE DOMAIN**

- 43 Analysing
- 35 Extrapolating
- 45 Judging

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>N</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td>For • effectiveness and any TWO of the following • mode of action • amount applied • LD₅₀ • half-life, the response • makes relevant observations about X and Y, referring to information from the graph and table • provides valid consequences of the observations. No incorrect statements have been included.</td>
<td>For • effectiveness and any ONE of the following • mode of action • amount applied • LD₅₀ • half-life, the response</td>
<td>For any ONE of the following • effectiveness • mode of action • amount applied • LD₅₀ • half-life, the response makes relevant observations about X and Y, referring to information from the graph or table provides valid consequences of the observations.</td>
<td>For each of any TWO of the following • effectiveness • mode of action • amount applied • LD₅₀ • half-life, the response provides a valid consequence of using the active ingredient/s.</td>
<td>For any ONE of the following • effectiveness • mode of action • amount applied • LD₅₀ • half-life, the response provides a valid consequence of using the active ingredient.</td>
<td>Response is unintelligible or does not satisfy the requirements for any other grade.</td>
<td>No response has been made at any time.</td>
</tr>
</tbody>
</table>

**Note:**
Reference to the specific ingredient/s involved must be made when 'providing a valid consequence of using the active ingredient/s'.
UNIT TEN

ITEM 17

Model Responses:

1. Active ingredient Y quickly kills off the number of nests per plot in the first 3 weeks, but the number of nests recovers to finish at about 6 nests per plot. For active ingredient X, the number of nests per plot increases initially and then decreases to about 12 nests per plot after the 24 weeks. Therefore active ingredient Y is more effective. The table shows that the LD_{50} for X is more than 34.6 g per kg and for Y it is 1.73 g per kg. This means that Y is more toxic as non-target animals need to ingest less Y per kg to kill 50% of them. The half-life for Y is 4 times that for X which indicates that Y will stay in the environment longer than X and could cause harm to non-target species.

2. Active ingredient X
   - number of nests per plot drops to approximately 11
   - more than 34.6 g required to be ingested per kg to kill 50% of non-target animals
   - 10 days for the amount to break down to half the original.

Active ingredient Y
   - number of nests per plot drops to approximately 6
   - 1.73 g per kg only to be ingested to kill 50% non-target animals
   - 43 days for amount to break down to half the original

Effectiveness
   - Y is more effective than X.

Risks
   - based on LD_{50}, Y is more toxic
   - from half-life, Y stays in the environment longer.