

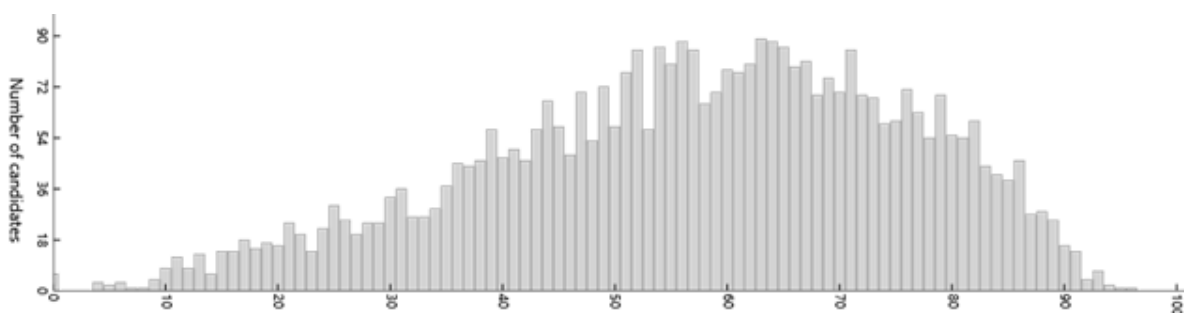


## Summary report of the 2023 ATAR course examination report: Chemistry

Year	Number who sat	Number of absentees
2023	3997	30
2022	4063	75
2021	4451	76
2020	4464	71

The number of candidates sitting and the number attempting each section of the examination can differ as a result of non-attempts across sections of the examination.

### Examination score distribution



### Summary

The examination paper was a fair and valid assessment that provided the opportunity to discriminate between candidate responses. The examination paper was an appropriate length as the majority of candidates answered most of the questions, resulting in few non-attempts in the later questions. The balance of level of difficulty allowed more candidates to access questions at their level of ability.

Attempted by 3997 candidates      Mean 56.97%      Max 94.55%      Min 0.00%

Section means were:

Section One: Multiple-choice	Mean 71.70%		
Attempted by 3997 candidates	Mean 17.93(/25)	Max 25.00	Min 0.00
Section Two: Short answer	Mean 50.02%		
Attempted by 3987 candidates	Mean 17.51(/35)	Max 33.89	Min 0.00
Section Three: Extended answer	Mean 53.85%		
Attempted by 3978 candidates	Mean 21.54(/40)	Max 39.53	Min 0.00

### General comments

The mean score in Section One was slightly higher compared to 2022, whereas the mean scores in Sections Two and Three were lower than those in the previous year.

### Advice for candidates

- Examine syllabus points closely, including Science as a Human Endeavour, ensuring that you can state, define and explain using correct chemistry terminology.
- Read questions carefully to determine what is required in your answer.
- Construct answers that are concise and appropriate, rather than writing everything you know about the concept, not necessarily answering the question.

- Ensure that when writing organic chemical formulae, the functional groups are written within the formula and can be distinguished from each other.
- Ensure you know the difference between condensed and molecular formula and can write them appropriately when required.
- When writing ionic equations, check for balancing of both atoms and charges.
- When writing observations for chemical reactions, ensure that you include all observations from before the chemicals react through to the final products. Observations should not include the names of chemicals, nor metals described as a metal.
- Do not use colourless, odourless gas as an observation statement. It is an inference.
- Ensure the correct use of arrows in chemical reactions.
- Ensure you describe corrosion prevention methods that are appropriate to the scenario.
- Do not use arrows to describe increase, decrease or left and right in written answers.
- Ensure that all bonding drawn in organic structures is connecting the correct atoms.

#### *Advice for teachers*

- Ensure that students know that all aspects of the syllabus are examinable, including the content for Science Inquiry Skills and Science as a Human Endeavour.
- Ensure that students practise answering similar contextual questions, that cannot be answered by rote-learned responses.
- Encourage students to be specific in their responses and answer the question asked, rather than writing everything they know about a context.
- Teach general concepts from first principles so that students can apply concepts to unfamiliar situations, not just write everything they know.
- Encourage students to present calculation answers in a neat and logical format showing what is being calculated at each step.
- Teach students to be specific in their choice of nouns such as 'volume' and 'concentration'; do not use the word 'amount' in their place.
- Ensure that students know which atoms connect to which when drawing organic molecules. Make sure that students know when to draw full structures as opposed to condensed structures.
- Keep abreast of IUPAC rules for nomenclature.

#### ***Comments on specific sections and questions***

##### **Section One: Multiple-choice (25 Marks)**

The Multiple-choice section was answered well, with a mean of 71.70%. Questions 8 and 20 were the most challenging, with mean scores under 50%. Question 8 required candidates to recognise that the word 'amount' should not be used as a variable when describing, for example, a volume or concentration. Question 20 required candidates to calculate an unknown standard reduction potential from given data.

##### **Section Two: Short answer (79 Marks)**

The mean for this section was 50.02%, down from 59.92% in 2022. Candidates performed best in Question 26, describing and writing equations for different aspects of acid and base theory. Question 28, defining and explaining a buffer system, and Question 32, which required candidates to explain dissolving due to types of intermolecular force, were the most challenging.

##### **Section Three: Extended answer (86 Marks)**

The mean for this section was 53.85%, down from 58.23% in 2022. Question 37 was answered well in this section.