

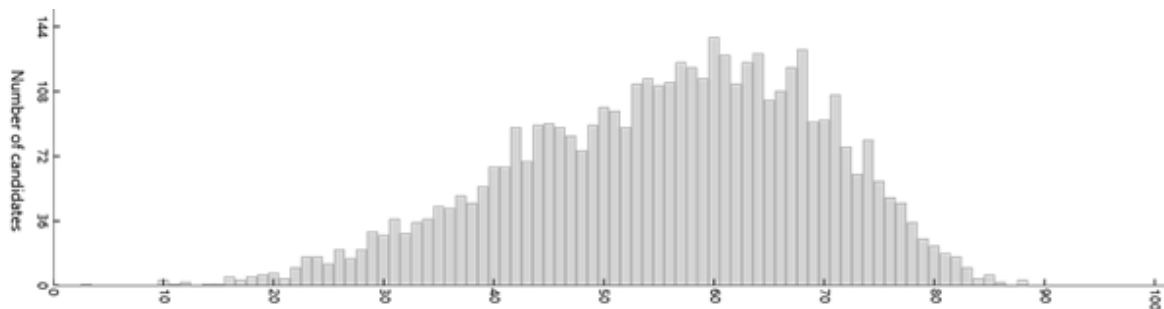


Summary report of the 2020 ATAR course examination: Human Biology

Year	Number who sat	Number of absentees
2020	4380	64
2019	4475	50
2018	4962	54
2017	4861	63

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–Written



Summary

Attempted by 4379 candidates Mean 55.61% Max 88.32% Min 0.00%

The paper discriminated well, producing scores from 0.00% to 88.32%. The paper was an appropriate length with most candidates attempting the final questions in the paper.

Section means were:

Section One: Multiple-choice	Mean 77.63%		
Attempted by 4379 candidates	Mean 22.09(/30)	Max 30.00	Min 0.00
Section Two: Short answer	Mean 48.66%		
Attempted by 4374 candidates	Mean 24.33(/50)	Max 41.82	Min 0.00
Section Three: Extended answer Unit 3	Mean 49.00%		
Attempted by 4303 candidates	Mean 4.90(/10)	Max 10.00	Min 0.00
Section Three: Extended answer Unit 4	Mean 42.87%		
Attempted by 4258 candidates	Mean 4.29(/10)	Max 10.00	Min 0.00

General comments

There was an increased proportion of candidates compared to previous years who did not attempt all question parts throughout the paper. Generally, those candidates who did attempt all questions in the paper were able to demonstrate good factual recall and understanding of the main concepts of the syllabus. In both Sections Two and Three, candidates could recall basic facts, but many often struggled to answer the in-depth analysis questions. Harder questions that were worth substantial marks had a notable proportion of candidates who did not attempt them.

Advice for candidates

- The examination is based on the syllabus and not a textbook. Candidates should expect a comprehensive coverage of most syllabus points in the examination; however, not every syllabus point will be examined. Although the same syllabus points may appear in consecutive examinations, questions will be structured in new and different contexts.

- Candidates must read questions carefully and ensure they understand the meaning of verbs used in the question. Candidates need to know the difference between a question requiring them to 'name' or 'identify' compared to one requiring them to 'describe' or 'explain'.
- Candidates are encouraged to try and answer every question. Candidates should always put something down as an answer, even if it is an educated guess. A non-attempt response only ensures a zero mark.
- Candidates need to focus on interpreting the question and providing a concise answer, rather than simply writing down all they have learnt on the topic. Stating key terminology or memorised facts will often not answer the entire question. Instead, candidates need to engage higher-order thinking skills and apply their knowledge.
- Candidates are reminded that no marks are available for restating information in their response from the question. Read the questions thoroughly and ensure the response covers the required question.
- The most thorough and complete responses in the extended section of the paper were produced by candidates who had completed a plan. Take time to plan your response and ensure all parts of the question are addressed.
- Candidates are encouraged to present annotated diagrams, charts or tables to construct responses to questions in the short and extended sections. This technique is particularly important in the extended answer section to help candidates write clear and precise answers and ensure that markers can easily follow and award marks for responses.

Advice for teachers

- Students require a detailed knowledge of all syllabus points and the ability to apply these points to new and different contexts. Simple recall and rote learning of facts are not enough for candidates to gain full marks in the examination. Candidates must be able to think critically and apply their knowledge to unique scenarios.
- There were several specific syllabus points that were not answered well in this examination. These include:
 - graphing and mathematical skills
 - treatment of Parkinson's disease with cell replacement therapy
 - specificity of the immunity provided by vaccinations
 - causes of the changes to allele frequencies in gene pools
 - alpha and beta thalassemia
 - differences between hominin skulls
 - trends in tool culture.
- Teachers are reminded that the textbook is not the syllabus. Supplementary teaching is necessary and learning with other references and resource materials beyond the textbook is essential.
- Examination technique should be modelled and reinforced throughout the year during classroom lessons and assessments.
- Mathematical skills are a required element in the syllabus document and the list of these skills goes beyond basic mathematical and graphing skills. Give candidates ample practise at applying all required mathematical skills in a scientific method context.
- While the question on animal ethics was actually quite successfully answered in the paper, the question reflected the need to address the whole syllabus document.
- Students need to be given ample practise at decoding extended response questions as part of their lessons and school-based assessment program. They need substantial practise in breaking down a question and identifying the question components.

Comments on specific sections and questions

In Section One, mean scores ranged from 17% to 93%. Some questions were answered very successfully in this section and demonstrated outstanding factual recall of specific syllabus points such as PCR, diabetes, thermoregulation, studies of comparative anatomy

and the divisions of the nervous system. Section Two had mean scores ranging from 30.4% to 74.8%. Questions relating to homeostasis were completed successfully. The extended answer section was the most demanding section of the paper with the lowest overall mean of the three sections. The mean scores of the Unit 4 questions were comparable at 43.9% for Question 41 and 41.4% for Question 42. However, the mean scores of the Unit 3 questions varied greatly with a mean of only 30.6% for Question 39 and 55.9% for Question 40. The syllabus content answered most successfully in the extended answer section related to the endocrine system and biotechnology.

Section One: Multiple-choice (30 Marks)

This section had an overall mean of 77.63%. The maximum mark achieved in this section was 100% and the minimum mark was 0%. Generally, questions were well answered with only Questions 16, 19, 20, 21 and 29 having mean scores at or below 60%. Questions 5, 8, 12, 13, 18 and 26 were the easiest with mean scores all above 85%. Candidates performed well on straightforward recall style questions and found the more complex, multi-step questions challenging.

The data presented in Question 16 is a frequency score in a continuous set and as such is best plotted as a histogram. Many candidates appear to have confused column graphs and histograms. Question 19 had a low mean, with many candidates unable to distinguish the diagram as being representative of a sensory neuron. Question 20 proved difficult with many candidates not knowing why an antibiotic cannot work on a virus. Question 21 required basic mathematical skills to complete with many candidates struggling with the simple calculations. Question 29 reported a very low mean score with most candidates not being able to distinguish between the *Australopithecus afarensis* and *Australopithecus africanus* skulls. Many candidates selected option (c) identifying skull Y as *Paranthropus robustus* which was incorrect.

Section Two: Short answer (110 Marks)

This section had an overall mean of 48.66%. The maximum mark achieved on the section was 83.64% and the minimum mark was 0%. Questions 31, 33 and 34 all had mean scores above 55%. Question 31 focused on homeostatic feedback loops and was the most successfully completed question in this section. Questions 32, 35, 36, 37 and 38 had mean scores below 50%. Question 36 on scientific method and thalassemia was the most problematic question of section two. Generally, candidates were able to demonstrate a good recall of basic facts and knowledge. The higher order and application questions were successful in differentiating candidates and provided an opportunity for candidates to demonstrate their understanding of course content.

Section Three: Extended answer Unit 3 (20 Marks)

This section had an overall mean of 49.00%. The maximum mark achieved on the section was 100% and the minimum mark was 0%. Question 40 was the most successfully answered question with a mean of 55.9%, while Question 39 achieved a mean of 30.6%. Generally, candidates who attempted questions using annotated diagrams and tables were able to construct more precise and understandable responses.

Section Three: Extended answer Unit 4 (20 Marks)

This section had an overall mean of 42.87%. The maximum mark achieved on the section was 100% and the minimum mark was 0%. Questions 41 and 42 had comparable mean scores of 43.9% and 41.4% respectively. Generally, candidates who attempted to answer the questions using annotated diagrams and tables were able to construct more precise and understandable responses.