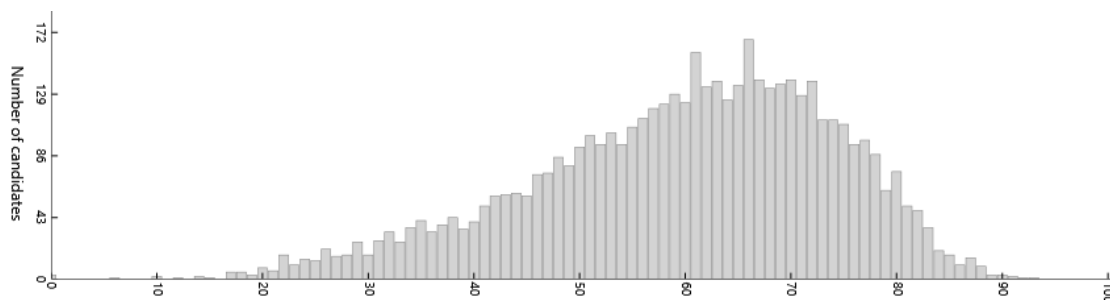




## Summary report of the 2018 ATAR course examination: Human Biology

Year	Number who sat	Number of absentees
2018	4962	54
2017	4861	63
2016	4709	85

### Examination score distribution–Written



### Summary

The examination was attempted by 4962 candidates with an overall mean of 59.69%. This mean is only slightly lower than the 60.58% in 2017 and similar to the mean of 59.70 in 2016. This demonstrates an excellent consistency in difficulty and accessibility of the paper over the past few years, even though a variety of question types and syllabus points have been covered. The paper discriminated well, producing scores from 0.00% to 93.16%. The paper was an appropriate length, with most candidates attempting all questions.

Section means were:

Section One: Multiple-choice	Mean 76.00%		
Attempted by 4962 candidates	Mean 22.80(/30)	Max 30.00	Min 0.00
Section Two: Short answer	Mean 57.11%		
Attempted by 4960 candidates	Mean 28.56(/50)	Max 46.79	Min 0.46
Section Three: Extended answer	Mean 42.38%		
Attempted by 4883 candidates	Mean 8.48(/20)	Max 19.25	Min 0.00

### General comments

The mean of 59.69% was a very pleasing result. Candidates were able to demonstrate good factual recall and an understanding of key concepts. The slight increase in the mean scores in both Section One: Multiple-choice and Section Two: Short answer from 2017 was encouraging. The mean of 42.38% in Section Three: Extended answer was disappointing and none of the three extended answer questions achieved a score above 50%. This reflects a deficit in the ability of candidates to generate longer answers that require an in-depth analysis of a concept, rather than a simple short answer response.

Many questions in the paper, particularly in Section Two: Short answer, required application of Human Biology knowledge to new contexts rather than to simply recite learnt facts. It is pleasing that many of these questions were correctly interpreted and responses demonstrated that candidates were able to apply their knowledge. However, only the top candidates were able to present precise and well-constructed responses which fully addressed these questions.

### *Advice for candidates*

- The examination is based on the syllabus and not on a textbook. You should expect a comprehensive coverage of syllabus points but not necessarily every syllabus dot point to appear in the examination. Although the same syllabus points may appear in consecutive examinations, questions will be structured in new and different contexts.
- You must read questions fully and ensure you understand the meaning of verbs used in the question. You need to know the difference between a question requiring them to 'name' or 'identify' to one requiring them to 'describe' or 'explain'.
- You are reminded that if information is stated in the question or provided in the data, no marks will be awarded for restating the same information in your response. Read the questions thoroughly and ensure responses are covering the required information.
- When questions state a numerical value of responses required (e.g. provide two examples), candidates must ensure they write only that number of responses. When you give more than the number of responses required only the required number of responses will be marked starting with the first response. You should always write their best answer first.
- You should plan your answer to the questions in Section Three. A plan will help produce the most thorough and complete response and ensure that all parts of the question are answered.
- You are encouraged to present annotated diagrams, charts or tables to construct responses to Section Two and Section Three. This technique not only helps you write clear and precise answers but ensures that markers can easily follow and award marks for responses.

### *Advice for teachers*

- Candidates 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 top 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 year's examination. These include:
  - mutations
  - comparative biochemistry
  - radiocarbon dating
  - hominid tools to provide insight into human lifestyle and culture.
- Teachers are reminded that the textbook is not the syllabus. Teachers should supplement their teaching and learning with other references and resource materials beyond the Newton and Joyce textbook.
- Candidates need to be given ample practice at decoding extended answer questions as part of their school-based assessment program. They need substantial practice in breaking down a question and identifying what the question requires. Examination technique should be modelled and reinforced throughout the year during classroom lessons and assessments.

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

Items in Section One: Multiple-choice worked very well, with mean scores ranging from 35% to 94%. Some questions were answered very successfully in this section and demonstrated outstanding factual recall of specific syllabus points such as the types of immunity, vestigial organs, spinal reflexes and comparisons between the endocrine system and the nervous system. Section Two: Short answer was also pleasing with mean scores ranging from 43% to 66%. Section Three: Extended answer proved the most demanding of the paper with disappointingly low mean scores in all three questions. The best mean score for Section Three was Question 40 but that was still below 50%. Question 41, which was solely focused on mutations, was done particularly poorly with a very low mean of only 31%.

#### **Section One: Multiple-choice (30 Marks)**

Section One had an overall mean of 76.00%. All questions were well answered generally with only questions 6, 10 and 17 having mean scores below 60%. Questions 1, 3, 4, 11, 15, 16, 18, 20, 22 and 26 were the easiest with mean scores all above 85%. As expected, candidates performed well on straight forward recall style questions and found the more complex, multi-step questions challenging.

Question 6 was the most poorly answered question of the section. Many candidates did not interpret the direction of the nervous impulse correctly and selected option (a) in error. Question 8 demonstrated some confusion on the movement of ions during an action potential with a significant number of candidates selecting the option stating that sodium ions would move out instead of selecting potassium ions. Question 10 required candidates to apply their knowledge of genetic drift to a new context of the bottleneck situation. Responses on this question were mixed, highlighting that not all candidates could identify the importance of small population size on the process of random genetic drift. Question 17 assessed the structure of the meninges of the brain in greater depth than in previous papers. Responses on this question were mixed showing that many candidates lacked the more comprehensive knowledge to answer it correctly. In Question 24 many candidates selected (d) incorrectly stating that principle of superposition would be relevant in dating new fossils. However, the best answer in this case was correlation of rock strata containing index fossils. This indicates that candidates lack the understanding to distinguish between these similar but most certainly different processes of fossil dating.

It is important to note that Question 3 was awarded two correct answers, (b) and (d). While writing the examination, in line with previous years, answer (d) relating to heterozygous advantage was considered wrong. Previous research has pointed to the advantages of the thalassemia trait associated with resistance to malaria being the result of polygenes and the number of mutations present, not the heterozygote genotype. However, more recent research indicates that individuals with the heterozygote condition for thalassemia have a lessened risk of myocardial infarction and thus a heterozygote advantage is factual. Most responses from candidates were split between both (b) and (d) and as such it was decided to award both.

#### **Section Two: Short answer (109 Marks)**

This section had an overall mean of 57.11%. Questions 31, 32, 33, 37 and 38 all had mean scores above 55%. Question 37 focusing on hormones and their actions, was the most successfully completed question in this section. Only Questions 36 and 39 had mean scores below 50%. Question 39 which focused on evidence for evolution and dating techniques, proved to be the most problematic. 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 allowing the top candidates to show their greater understanding of the syllabus.

**Section Three: Extended answer (40 Marks)**

This section had an overall mean of 42.38%. This is a disappointing drop in the mean score for this section compared to 2016 and 2017. None of the three extended answer questions were completed well but question 41 proved to be especially challenging for candidates.

Questions 40 and 42 had relatively similar mean scores and were also the more popular of the questions chosen by candidates. Candidates who attempted to answer the questions using annotated diagrams and tables, were able to construct more precise and understandable responses. A common fault in the responses in this section was the inability to use scientific terminology to construct an analytical answer. Many responses simply did not use key terms correctly or in some cases not use key terms at all. Candidates must be able to use the language of Human Biology fluently in the construction of an extended response in order to demonstrate their understanding of the concepts.