

Assessment Report

New Zealand Scholarship Biology 2020

Standard 93101

Part A: Commentary

Successful candidates wrote concise well-planned answers addressing each aspect of the question.

A significant number of candidates “brain dumped” what they knew of human evolution without relating it to the question. Some candidates showed a lack of understanding about the basic timeline of human evolution (when bipedalism, tool use, language, domestication, control of fire etc occurred). This led to incorrect explanations for differences between the hominins.

Successful candidates were able to select key ideas from the resource material and integrate relevant biological concepts to show understanding.

Some candidates would have benefited from understanding basic plant reproductive biology (particularly the confusion of self-pollination with asexual reproduction).

Part B: Report on performance standard

Candidates who were awarded Scholarship with **Outstanding Performance** commonly:

- wrote concise answers that were well planned and addressed each aspect of a question
- integrated their own knowledge from biological concepts wider than the question
- justified their statements in several different ways rather than moving on too quickly
- did not include irrelevant material in their response
- selected key ideas from the resource material and integrated this information and their own knowledge to show their understanding
- related every point they made back to the question
- displayed high level literacy skills including clear and concise comparisons
- made inferences based on connections between different parts of the resource material
- showed a comprehensive understanding of the evidence obtained from fossils (DNA, proteins, age, location) and applied this to explain hominin dispersal and evolution
- understood the implications of gene flow (or lack thereof) and how this may impact populations.

Candidates who were awarded **Scholarship** commonly:

- planned their answers well and wrote in a coherent way
- related most of the points they made back to the question
- used correct biological terms throughout their answers
- did not unnecessarily repeat themselves
- linked ideas together to explain concepts using the resource material and their own knowledge
- answered all parts of the questions

- had a good basic knowledge of a wide range of topics relevant to the examination.
- recognised that the frogs were likely to diverge into separate species via allopatric speciation due to lack of gene flow/isolation
- linked the behaviours of the frogs to avoid predation to survival of the species and/or individual
- understood the population survival benefits of an r-reproductive strategy
- linked the MHC allele frequency evidence to the different selection pressures of each habitat area
- explained the impact of low genetic variation in a population to its survival (using the data to support their response)
- accurately identified the pollination method of thermal and non-thermal monkeyflower plants and linked this to pollinator availability and floral structure
- recognised that sympatric speciation of the thermal and non-thermal plants was likely to occur in the future
- identified RIMS as temporal, ecological and/or structural using examples
- recognised that divergent evolution by sympatric speciation resulted in the two monkeyflower species
- recognised that *E. nastua* must have started as a small population and discussed the implications of this
- clearly compared the biological features of Denisovans/Neanderthals with *Homo sapiens* and explained the reason for the difference.

Other candidates

Candidates who were **not** awarded Scholarship commonly:

- restated the information in the question without justification or links to biological concepts
- did not answer all 3 questions
- confused diurnal for crepuscular or active day AND night
- assumed all the predators named in Q1 were diurnal
- restated 'photoresponse' from the question without recognising this as negative phototaxis
- stated that speciation had occurred (when it was still just one species), when talking about the different populations of Hochstetter's frog or thermal & non-thermal monkeyflowers
- confused allopatric and sympatric speciation
- stated that self-pollination was a form of asexual reproduction
- did not link the short growth phenotype difference of thermal monkeyflower plants to the warmth of the soil
- incorrectly discussed the reason the summer flowering non-thermal monkeyflower had tall flowers was to grow through the snow
- incorrectly identified the purpose of flowers being for photosynthesis
- did not understand the lifecycle of plants (annual vs perennial).
- did not recognise that *E. nastua* started from a small population with low genetic diversity and was therefore subject to genetic drift and inbreeding
- lacked basic knowledge of biological processes with regards to plant reproduction and human evolution
- included the adaptations for bipedalism as evidence to compare hominins despite them all being efficient bipeds
- assumed that Denisovans and Neanderthals were vegetable/raw food eaters to explain the difference in thickness of tooth enamel/jaw size compared to *Homo sapiens*
- wrote at length about commonalities between different hominins rather than about essential differences
- thought Denisovans were an intermediate evolutionary step between Neanderthals and *Homo sapiens*
- misread the diagram comparing the 3 hominins
- did not grasp the idea that because all 3 hominins have a gene it must have been present in the common ancestor
- stated that 'use of fire' was a difference between the three cited hominin species, not recognising that control of fire occurred before all 3 of the hominins appeared.

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