NZQA
New Zealand Qualifications Authority
Mana Tohu Matauranga O Aotearoa

Assessment Report

Level 3 Biology 2016

Standards 91603 91605 91606

Part A: Commentary

Candidates who recognised the key concepts and could describe them succinctly in all questions achieved the standard.

Those who planned their answers tended to provide a more logical answer.

Successful candidates addressed the main stem of the question, not just the bullet points.

To gain Excellence, candidates needed to use their knowledge of the terms and concepts learned and apply this to a new situation.

Candidates are advised to avoid the excessive use of anthropomorphism, particularly in reference to plant and animal relationships.

Candidates are encouraged to check the examination specifications that are current for that year.

Part B: Report on Standards

91603: Demonstrate understanding of the responses of plants and animals to their external environment

Candidates who were awarded **Achievement** commonly:

- recognised the key interspecific relationships and used correct terminology
- showed understanding of linear hierarchy and stated how the hierarchy is maintained in hyenas using dominance and submissive displays
- recognised the factors that determine dominance within a hierarchy
- interpreted the table to describe the order of the hierarchy.
- used correct terminology associated with endogenous rhythms to describe the actograms
- interpreted the actograms correctly to describe the behaviour of the weta.

Candidates who were assessed as **Not Achieved** commonly:

- did not grasp the requirement of the questions
- could not accurately identify, name, and describe the interspecific relationships involved
- were unable to describe a linear hierarchy
- were unable to correctly place individuals in a linear hierarchy from the table provided
- were unable to identify individuals that were challenging their position within the hierarchy
- could not describe factors that would affect an individual's position in a linear hierarchy
- did not identify aspects of an actogram to correctly describe the behaviour and biological rhythms
- were unable to describe terms associated with the control of biological rhythms
- did not describe how the benefits of a biological rhythm increased the survival of the organism.

Candidates who were awarded **Achievement with Merit** commonly:

- explained a benefit and a cost of the relationships rather than just stating benefits and costs for each species
- recognised wider ideas associated with costs such as the dependency between close relationships
- recognised that hierarchies reduce aggression between hyenas
- applied understanding of the table correctly to explain why hyena D was challenging
- explained why factors such as age would lead to a high position of dominance within the hyena hierarchy
- explained how life in a hierarchy is beneficial compared to a solitary existence
- were familiar with actograms and explained why each actogram exhibited the rhythms shown, using both the data and correct terminology.

Candidates who were awarded **Achievement with Excellence** commonly:

- evaluated the costs and benefits for each individual (or behaviour of the individual) in an interspecific relationship
- linked that despite these costs, there are more benefits to the individual, which is why the relationship exists
- evaluated how the hierarchy benefitted the individual and compared this with either living in solitude or to the survival of the population/clan as a whole
- discussed comprehensively the rhythm of the organisms shown on the actogram
- compared aspects of the actograms using appropriate terminology
- evaluated how the rhythm and the control mechanism of the rhythm were beneficial to the organism in their specific niche
- linked their ideas and explained their reasoning in depth.

Standard-specific comments

Candidates are advised to use the standard-specific terminology within the context of questions.

Candidates would find it helpful to learn biological concepts within contexts so that they can practice linking all the ideas within an unfamiliar context.

91605: Demonstrate understanding of evolutionary processes leading to speciation

Candidates who were awarded **Achievement** commonly:

- identified Natural Selection as a process that is integral to the evolution of populations
- used correct vocabulary to describe key processes of evolution and speciation
- found suitable example(s) of the biological processes from the resource material to support their description
- identified correctly the relevant biological processes involved in evolution and speciation.

Candidates who were assessed as **Not Achieved** commonly:

- limited description of Natural Selection to “survival of the fittest” with few further details
- gave generalised and incomplete definitions for key biological terms – for example, genetic variation, mutation, allopatric speciation
- described biological processes with little or no reference to the resource material.

Candidates who were awarded **Achievement with Merit** commonly:

- explained, in the context of the question, the process of Natural Selection, including favourability of different phenotypes under selection pressures to allow for survival and breeding
- explained the effects and consequences of similar selection pressures in different environments
- explained the biological effects of competition, predation, habitat isolation at population level
- explained how selective advantage could be gained through different adaptations.

Candidates who were awarded **Achievement with Excellence** commonly:

- discussed the process of Natural Selection linked to the context given in the question
- included relevant details such as selection for suitable phenotypes with corresponding alleles becoming more frequent in the gene pools of the populations
- discussed possible consequences of Natural Selection over time, including plausible speciation mechanisms of populations under different selection pressures
- contrasted the effects of selection pressure in two different environments to identify similarities and differences between them

- evaluated links between connected biological ideas, and related the mechanisms of speciation to a relevant environmental context (glacial/climate change/habitat diversification etc.).

Standard-specific comments

The examination covered a range of ideas from the standard at all levels of achievement.

Candidates were more successful at comparing and contrasting than at justifying or analysing the information.

Some candidates did not understand the biogeography of New Zealand, or what fossil evidence is.

91606: Demonstrate understanding of trends in human evolution

Candidates who were awarded **Achievement** commonly:

- gave clear and concise definitions for key terms
- knew the correct names for parts of the skull and their location or function
- defined the term cultural evolution and identified the tool culture associated with more than one species
- gave brief descriptions of how the named hominins constructed the named tool types
- provided reasons and benefits for migrating out of Africa
- gave simple descriptions of the ‘out of Africa’ model and of mtDNA.

Candidates who were assessed as **Not Achieved** commonly:

- did not answer the bullet points of the question
- restated the information in the question without adding any further descriptors or connectors
- did not name or describe key terms
- identified skull features but could not provide the location or function of these structures.

Candidates who were awarded **Achievement with Merit** commonly:

- explained how changes in skull features can be linked to evidence for bipedalism or to dietary changes
- explained how the different forms of cultural evolution are adaptive advantages for the associated species
- explained the effects of ice ages and formation of land bridges in relation to access routes out of Africa
- explained the evidence used to support the ‘out of Africa’ dispersal model.

Candidates who were awarded **Achievement with Excellence** commonly:

- discussed how changes in skull features provided the selective forces in the trends towards bipedalism, changes in diet, and the increasing intelligence of these hominins
- discussed and linked the adaptive advantages to the survival rate for the species through successful reproduction passing on the favourable traits to the next generation
- discussed and linked how the environmental changes affected rates of dispersal to different parts of the world.

Standard-specific comments

In Question 1, candidates who gained Excellence correctly discussed and linked how the reduction in the early robust features of Skull A provided an opportunity for more energy/space to be directed towards an increase in the cranial capacity and, therefore, brain size of Skull B.

In Question 2, candidates who gained Excellence demonstrated higher level thinking skills by identifying possible disadvantages that cultural trends have had on biological evolution of these early hominins. For example, the reliance on rapid advances in cultural changes has seen the reduced effect that the process of natural selection has had on the populations of these hominins.

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