

Assessment Report

New Zealand Scholarship Physics 2019

Standard 93103

Part A: Commentary

Most candidates made a serious attempt at this examination. General performance across all questions was similar. All candidates are advised to spend time at the beginning of the examination reading through the entire paper to help ensure they answer every question in a succinct, logical fashion.

Candidates who were awarded Scholarship were well prepared and had a grasp of the physics required at this level. Candidates who gained Scholarship with Outstanding Performance displayed sound physics understanding and expert algebraic skills to demonstrate outstanding problem-solving capabilities. Those candidates were able to write succinctly, demonstrating clear conceptual understanding.

Many candidates found Question Five in particular challenging. The context is a familiar one and the underlying physics was very similar to Question One where candidates generally performed well. Many candidates produced reasoning for their solutions that showed a lack of understanding of concepts such as conservation of momentum and impulse. Commonly, their explanations demonstrated a lack of physical intuition in a very familiar context. This particular question strongly demonstrated that success in Scholarship Physics is built upon a very sound understanding of the foundational concepts of Level 2 and 3 Physics.

Part B: Report on performance standard

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

- demonstrated correct application of key physics concepts such as conservation laws in familiar and unfamiliar situations
- provided very clear written explanations of their answers
- applied concepts from different areas of physics to a single problem, e.g., the effect of an electric field on the motion of objects in 2D
- made no mathematical errors
- correctly applied detailed reasoning and analysis to problems that required multiple steps
- understood the role of capacitors and inductors in a circuit and could use this information to calculate the current in different circumstances.
- successfully used conservation of momentum and energy in a range of contexts

Candidates who were awarded **Scholarship** commonly:

- demonstrated correct application of key physics concepts such as conservation laws in familiar situations
- provided written explanations of their answers
- applied concepts from different areas of physics to a single problem
- applied detailed reasoning and analysis
- showed competence with mathematics
- explained how light demonstrates wave-like and particle-like behaviours.
- understood impulse and how it relates to force and time.
- explained the effect of an electric field on charged particles.
- used conservation of energy to find the maximum tension in a rope
- explained the role of a capacitor and/or an inductor in a circuit.

Other candidates

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

- showed gaps in their knowledge causing them to leave sections of the paper unanswered
- did not follow the instructions given in a question and as a result did not answer all parts of a question
- were unable to apply the mathematical skills required to answer questions
- provided unclear explanations, and used explanations that were not based on fundamental concepts
- incorrectly applied fundamental concepts, or were unable to identify the correct concept to use
- correctly showed that a relationship was dimensionally correct
- confused electric and magnetic fields
- did not understand the difference between “current” and “rate of change of current”
- applied Kirchhoff’s circuit laws incorrectly.

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Previous years' reports

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