Assessment Report

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Level 1 Physics 2020

Standards 90937 90938 90939

Part A: Commentary

Candidates had the opportunity to demonstrate their understanding over a broad range of physics concepts covered by the three standards.

Part B: Report on standards

90937: Demonstrate understanding of aspects of electricity and magnetism

Candidates who were awarded **Achievement** commonly:

- used key phrases to describe concepts
- selected the correct formula
- could substitute numbers into an equation and provide an answer
- understood the principles of a gong
- calculated answers but did not include the correct unit

- had a good understanding of one out of the three parts of the standard – static electricity, circuits, or electromagnetism.

Candidates whose work was assessed as **Not Achieved** commonly:

- were unable to use key terms to explain basic concepts
- were unable to produce circuit diagrams and charge diagrams
- could not substitute into basic equations and find an unknown
- displayed little knowledge of the scientific concepts they were required to identify and explain, or left questions blank
- talked about protons moving or positive electrons moving
- could not identify and use a formula
- did not understand standard form or exponential use of small or large numbers
- did not know the difference between conductors and insulators.

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

- could correctly draw most diagrams, but often made careless mistakes with diagrams and explanations, or omitted important information
- were able to complete equations that required a two-step problem solving technique
- understood the principle of an electroscope
- knew the effect of “grounding” and that the symbols for A and V are circles and not squares
- knew that ammeters are connected in series while voltmeters are connected in parallel
- understood the idea of supply voltage
- knew that a battery is made up of more than one cell
- understood that a branch with less resistance draws more current in parallel
- acknowledged quantities that were constant when explaining the relationships between quantities in formulae

- had a good understanding of two out of the three parts of the standard – static electricity, circuits and / or electromagnetism.

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

- had a very good understanding of the key concepts and were able to link the key scientific concepts of electricity and magnetism
- produced diagrams that were accurate and precise
- completed all the calculations and were able to use scientific notation on their calculators without any difficulty
- had a good understanding of all three parts of the standard – static electricity, circuits, and electromagnetism
- related their answers fully to the context of the question.

Standard specific comments

Candidates were able to use calculators correctly for most calculations, however some candidates need to learn how to use index notation on their calculators.

Candidates who have had exposure to basic electrical equipment like electroscopes, electric bells did better than candidates who have not been exposed to these things.

90938: Demonstrate understanding of aspects of wave behaviour

Candidates who were awarded **Achievement** commonly:

- were able to use $v = f\lambda$ to calculate the frequency
- understood the difference between a longitudinal and transverse wave
- recognised the wavelength on a diagram of a longitudinal wave
- described a difference between light and sound waves
- understood the difference between diffraction and refraction.

Candidates whose work was assessed as **Not Achieved** commonly:

- could not perform simple calculations
- had little idea about diffraction or refraction
- were unable to locate images in a plane mirror
- could not state the angle of incidence as between ray and normal
- could not draw ray using law of reflection
- could not draw image in plane mirror equidistant from mirror as object
- could not draw and label wavelength on longitudinal wave.

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

- had a good understanding of reflection, diffraction, and refraction
- could accurately draw ray diagrams to locate images in plane mirrors, or to show refraction and diffraction (same wavelength)
- understood that frequency does not change during refraction
- draw correct apparent depth diagram using two rays
- explain two requirements of total internal reflection.

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

- had an in-depth understanding of all the above concepts
- wrote explanations that were clear and concise
- correctly drew reflection ray diagram
- correctly explained that light travels nearly instantaneously, whereas sound travels at roughly 1/3 of a kilometre per second in air at sea level
- correctly described the conditions of total internal reflection and how changing position meets / does not meet those conditions.

Standard specific comments

Candidates used two rays to locate the images of the various objects throughout the paper.

90939: Demonstrate understanding of aspects of heat

Candidates who were awarded **Achievement** commonly:

- correctly defined terms such as latent heat, and correctly described phenomena such as convection currents
- linked the concepts of heat transfer to the question context, but answers lacked depth, such as not explaining the method of heat transfer
- partially interpreted the heating curve
- used the correct formulae, but did not convert quantities to the correct units
- were able to identify only one aspect of thermal expansion, and calculated only part of an answer
- listed reasons for heat loss without reference to the method of heat transfer.

Candidates whose work was assessed as **Not Achieved** commonly:

- left several parts in each question unanswered
- chose incorrect formulae for calculations
- were unable to link the concepts of heat transfer to the context of the questions
- could not describe any aspects of thermal expansion
- were unable to define convection.

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

- clearly explained a range of concepts within each question and ensured the answer was linked directly to the question
- clearly identified the specific aspect of heat being examined in unfamiliar contexts
- carried out multiple step calculations accurately, but did not link the relevant concept to support correct calculation.

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

- explained and discussed relevant concepts within each question
- made links between aspects of heat and the context of exam questions

- carried out multiple step calculations accurately, and used the relationships in these formulae to support their discussions of aspects of heat relevant to the context in question, such as latent heat with reference to kinetic theory.

LIVE

Standard specific comments

Physics subject page

Previous years' reports

2019 (PDF, 109KB)

2018 (PDF, 112KB)

2017 (PDF, 43KB)

2016 (PDF, 232KB)