

Assessment Report

Level 2 Physics 2017

Standards [91170](#) [91171](#) [91173](#)

Part A: Commentary

Candidates are advised to clearly explain what they are doing at each step in calculation questions. It is hard for markers to give credit to a space filled with numbers. Writing the relevant formula, then substituting numbers then giving the correct numerical solution with correct units, is expected. "Show" questions particularly require some sort of explanation.

When making comparative statements such as "resistance is increasing", candidates should be clear whether they are referring to the total resistance or the resistance of a component in the circuit.

Candidates need to answer all parts of a question, in particular, when instructed to give a direction or state an assumption.

Part B: Report on standards

91170: Demonstrate understanding of waves

Candidates who were awarded **Achievement** commonly:

- completed ray diagrams and describe images
- carried out simple one step calculations
- recognised straightforward physics principles and apply them to a context
- described the effects of a change in a variable in a problem
- recognised applications of diffraction and interference.

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

- drew very poor ray diagrams
- gave incorrect values for symbols leading to incorrect answers
- were unable to calculate sines of angles or use trigonometry
- were unable to carry out reasonable calculations
- were unable to interpret questions requiring understanding of reflection, refractions, lenses, wave refraction, diffraction and interference
- confused the type of images formed from a concave and convex mirror.

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

- completed ray diagrams and calculations
- used correct significant figures
- explained how physics principles apply in a range of appropriate contexts and question settings
- completed mathematical calculations beyond a simple one step level
- described interference, but failed to discuss path difference.

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

- comprehensively explained physics principles and apply them to the context of the question
- completed two and three-step calculations
- identified when to make values negative to correctly calculate distance using Descartes law. (a very few could do this)
- identified how a lens can be modified to change the focal length.(a very few could do this).

Standard specific comments

Candidates should use a ruler for all ray diagrams, labelling points when asked.

For *Show* questions, it is expected pupils provide full working, including the formula, substitution and then the correct numerical answer.

Contrasting image types for two different mirrors and/or lenses and describing interference in terms of path difference continues to be an area candidates struggle with.

91171: Demonstrate understanding of mechanics

Candidates who were awarded **Achievement** commonly:

- applied the principle of conservation of momentum to calculate velocity
- drew free body force diagrams
- calculated the time of flight of a projectile
- described how to reduce the force experienced by a high-jumper on landing
- stated the necessary conditions for equilibrium
- calculated a torque
- used the formula for centripetal force
- selected appropriate formulae, substituted correct values and completed one-step calculations accurately
- described straightforward concepts that were relevant to the given situation.

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

- were unable to recognise which physics concept was applicable to the situation in a particular question, neither for the descriptive nor for the numerical aspect
- could not draw closed vector diagrams
- were unable to calculate torques or explain how torques changed when the mass moved.

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

- stated the condition under which momentum is conserved

- completed questions involving momentum and impulse
- drew a closed vector diagram with only one error
- calculated a value for elastic potential energy using or using work done.
- explained how a change to a mat could reduce the force experience by a high-jumper on landing
- carried out two-step calculations involving torques
- calculated the speed of a rotating object given non-standard data
- calculated the elastic potential energy of a spring
- selected appropriate formulae, substituted correct values and completed two-step calculations accurately
- made valid links between connected physics ideas.

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

- applied the concept of impulse correctly to solve a problem
- drew an accurate closed vector diagram
- linked all ideas connecting force, time of impact and change of momentum
- discussed clearly the effect of changing position has on torques and forces on a balanced plank.

Standard specific comments

Closed vector diagrams and multi-step torque questions continue to be an area candidates struggle with.

91173: Demonstrate understanding of electricity and electromagnetism

Candidates who were awarded **Achievement** commonly:

- completed simple one step calculations
- used an appropriate rule to determine the direction of the force
- stated that electrical potential energy changed to kinetic energy
- knew how adding a component to circuit changed the total resistance of the circuit.

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

- gave circular arguments
- used imprecise language instead of physics terms
- confused electric and magnetic fields
- thought that when you altered the total resistance of the circuit the current stayed the same
- could not explain how a voltage was induced by a conductor moving across a magnetic field and thought you needed a battery to get a current
- stated generic circuit concepts like, voltage is the same in parallel.
- gave the direction of the force as “towards the positive plate” where the positive plate was not labelled
- stated that the right-hand slap rule was the reason why a voltage was induced
- used the term power as a generic term for electricity.

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

- linked the brightness of a bulb to its power and explained how changing the current through the bulb affected its brightness
- correctly applied the right-hand slap rule to determine the direction of force
- explained why a charged object in a uniform field experienced a constant force.

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

- completed multi step calculations accurately

- explained what they were calculating at each step
- gave coherent arguments using precise physics terminology
- completed all parts of the question and stated assumptions in words when asked
- described why no current flowed in terms of opposing induced voltages and not opposing currents
- correctly identified and used the distance the diaphragm moved in q1d.

Standard specific comments

There were too many candidates who stated that a voltage was induced because of the “right hand rule”. They need to realise that these “rules” are ways to work out the direction not the cause.

Often candidates would omit giving a direction when it was asked for.

Explaining how a voltage is induced in a conductor moving across a magnetic field and under what conditions a current flows continues to be an area candidates struggle with.

Physics subject page

Previous years' reports

[2016 \(PDF, 0KB\)](#)

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