

Course assessment structure:

Question Paper

The question paper has 155 marks. This is scaled by SQA to represent 75% of the overall marks for the course assessment.

The question paper contains restricted-response and extended-response questions.

A data sheet and a relationships sheet are provided.

The majority of the marks are awarded for applying knowledge and understanding. The other marks are awarded for applying skills of scientific inquiry, scientific analytical thinking and problem solving.

- The question paper gives candidates an opportunity to demonstrate the following skills, knowledge and understanding:
- making accurate statements
- providing descriptions and explanations and integrating knowledge
- applying knowledge of physics to new situations, interpreting information and solving problems
- planning or designing experiments/investigations, including safety measures, to test given hypothesis or to illustrate given effects
- selecting information from a variety of sources
- presenting information appropriately, in a variety of forms
- processing information/data (using calculations, significant figures and units, where appropriate)
- making predictions based on evidence/information
- drawing valid conclusions and giving explanations supported by evidence/justification
- identifying sources of uncertainty and suggesting improvements to experiments

Project

The project has 30 marks. This is scaled by SQA to represent 25% of the overall marks for the course assessment.

The purpose of the project is to allow the candidate to carry out an in-depth investigation of a physics topic and produce a project report. Candidates are required to plan and carry out a physics investigation.

Candidates should keep a record of their work (daybook) as this will form the basis of their project report. This record should include details of their research, experiments and recorded data.

The project assesses the application of skills of scientific inquiry and related physics knowledge and understanding. It gives candidates an opportunity to demonstrate the following skills, knowledge and understanding:

- extending and applying knowledge of physics to new situations, interpreting and analysing information to solve more complex problems
- planning and designing physics experiments/investigations, using reference material, to test a hypothesis or to illustrate particular effects
- recording systematic detailed observations and collecting data
- selecting information from a variety of sources
- presenting detailed information appropriately in a variety of forms
- processing and analysing physics data (using calculations, significant figures and units, where appropriate)
- making reasoned predictions from a range of evidence/information
- drawing valid conclusions and giving explanations supported by evidence/justification
- critically evaluating experimental procedures by identifying sources of uncertainty, and suggesting and implementing improvements
- drawing on knowledge and understanding of physics to make accurate statements, describe complex information, provide detailed explanations, and integrate knowledge communicating physics findings/information fully and effectively
- analysing and evaluating scientific publications and media reports

Project overview Candidates carry out an in-depth investigation of a physics topic. Candidates choose their topic and individually investigate/research its underlying physics. Candidates must discuss potential topics with their teacher and/or lecturer to ensure that they do not waste time researching unsuitable topics. This is an open-ended task that may involve candidates carrying out a significant part of the work without supervision.

Throughout the project candidates work autonomously, making independent and rational decisions based on evidence and interpretation of scientific information, which involves analysing and evaluating results. Through this, candidates further develop and enhance their scientific literacy skills.

The project offers challenge by requiring candidates to apply skills, knowledge and understanding in a context that is one or more of the following: unfamiliar familiar but investigated in greater depth integrating a number of familiar contexts Candidates will produce a project report that has a logical structure.

Section	Expected response	Mark allocation
Abstract	A brief abstract (summary) stating the overall aim and findings/conclusion(s) of the project.	1
Underlying physics	<p>A description of the underlying physics that:</p> <ul style="list-style-type: none"> ♦ is relevant to the project ♦ demonstrates an understanding of the physics theory underpinning the project ♦ is of an appropriate level and commensurate with the demands of Advanced Higher Physics 	4
Procedures	Labelled diagrams and/or descriptions of apparatus, as appropriate.	2
	Clear descriptions of how the apparatus was used to obtain experimental readings.	2
	<p>Procedures are at an appropriate level of complexity and demand. Factors to be considered include:</p> <ul style="list-style-type: none"> ♦ range of procedures ♦ control of variables ♦ accuracy and precision ♦ originality of approach and/or experimental techniques ♦ degree of sophistication of experimental design and/or equipment 	3
Results (including uncertainties)	Data is sufficient and relevant to the aim of the project.	1
	Appropriate analysis of data, for example, quality of graphs, lines of best fit, calculations.	4
	Uncertainties in individual readings and final results.	3
Discussion (conclusion(s) and evaluation)	Valid conclusion(s) that relate to the aim of the project.	1
	<p>Evaluations of experimental procedures to include, as appropriate, comment on:</p> <ul style="list-style-type: none"> ♦ accuracy and precision of experimental measurements ♦ adequacy of repeated readings ♦ adequacy of range over which variables are altered ♦ adequacy of control of variables ♦ limitations of equipment ♦ reliability of methods ♦ sources of uncertainties 	3

Section	Expected response	Mark allocation
	Coherent discussion of overall conclusion(s) and critical evaluation of the project as a whole, to include, as appropriate, comment on:	3
	<ul style="list-style-type: none"> ♦ selection of procedures ♦ problems encountered during planning ♦ modifications to planned procedures ♦ interpretation and significance of findings ♦ suggestions for further improvements to procedures ♦ suggestions for further work 	
	A report which indicates a quality project.	
Presentation	Appropriate structure, including informative title, contents page and page numbers.	1
	References cited in the text and listed at an appropriate point in the report. Citing and listing using either Vancouver or Harvard referencing system.	1
Total		30