



External Assessment Report 2011

Subject	Physics
Level	Standard Grade

The statistics used in this report are pre-appeal.

This report provides information on the performance of candidates which it is hoped will be useful to teachers/lecturers in their preparation of candidates for future examinations. It is intended to be constructive and informative and to promote better understanding. It would be helpful to read this report in conjunction with the published question papers and marking instructions for the Examination.

Comments on candidate performance

General comments

The majority of Markers thought that the examination was good, fair and balanced. They also felt that it tested a wide range of Learning Outcomes from the Arrangements for Standard Grade Physics, at both General and Credit level.

Both papers contained a variety of types of questions constructed to assess the achievement of the Course Objectives. This included multiple-choice questions (at General level), questions requiring information to be extracted from graphs and tables, short- and extended-answer questions, questions requiring recall of knowledge, and questions requiring analysis of given information applied to specific applications.

The majority of Markers commented that, for each level, the questions were accessible to well prepared candidates. Also, the performance and responses of most candidates to questions from all of the Units of the Course seemed to be balanced.

There was no evidence of candidates being rushed or having insufficient time to complete both examinations.

Again, several Markers commented on the maintained improvement, by *most* candidates, in the selection of the appropriate relationship for numerical questions since the introduction of the Physics Data Booklet. A few Markers commented on the inappropriate selection of relationships by a few candidates, despite the availability of the Physics Data Booklet. This may indicate a lack of preparation and practice using the Data Booklet by these candidates.

Although most candidates did seem to be well prepared for the examination, there was some evidence of some candidates not having applied sufficient effort to retain knowledge and facts.

There was also evidence that, at Credit level, some candidates had not sufficiently practised their problem solving skills in questions which required the interpretation and analysis of information and data. This failure to closely read the text caused some candidates to give only partial answers to the question, or misinterpret what was being asked.

As in previous years, there were common, careless mistakes or omissions in responses which have been consistently highlighted in these reports (eg missing or wrong Unit in the final answer to numerical problems).

Conversion into appropriate Units was a problem for some candidates, eg: g \rightarrow kg.

Again, for questions requiring explanations or descriptions, most candidates were able to express their answers clearly and precisely. Their correct use of appropriate terms and 'physics language' were of the required standard to gain full or partial credit for the question. Some candidates, however, gave additional *wrong* information, which led to some marks for the answer being withheld.

Areas in which candidates performed well

General level:

- Question 3 Identification of symbol for a light-emitting diode.
- Question 5 Use of Newton's First Law.
- Question 6 (a) Calculation of average speed.
- Question 7 (a)(i) Identification of receiver.
- Question 8 (b)(i) Calculation of resistance.
- Question 8 (b)(ii) Effect of increasing circuit resistance.
- Question 9 (b) Calculation of current from power rating and mains voltage.
- Question 13 (b)(i) Selection of input device.
- Question 15 (b) Calculation of acceleration.
- Question 16 (b)(i) Labelling of transformer parts.
- Question 17 (c) Naming renewable energy source.

Credit level:

- Question 1 (a)(ii) Calculation of distance.
- Question 2 (a)(i) Combination of primary colours.
- Question 3 (a) Power calculation.
- Question 5 (a) Lens identification.
- Question 6 (b) Radioactivity safety.
- Question 8 (a) Completion of truth table.
- Question 10 (c)(ii) Calculation of distance travelled.
- Question 11 (b)(ii) Calculation of time using power and energy.
- Question 12 (a) Calculation of potential energy.
- Question 14 (b) Identification of spectral lines.
- Question 15 (b) Calculation of acceleration.

Areas which candidates found demanding

General level:

- Question 2 Identify ray paths for inverted image.
- Question 4 Identify the effect on the temperature and heat energy of a substance.
- Question 11 Explanation of stethoscope operation. (Several answers were too vague in the explanation of its function.)
- Question 15 (a) State meaning of the term 'acceleration'. (Several candidates failed to explain this Learning Outcome clearly.)
- Question 16 (b)(iii) Reason for power transmission at high voltage. (Several candidates failed to explain this Learning Outcome clearly.)

Credit level:

- Question 4 (a) Explanation of why mains switch is connected to live supply. (Several candidates had a poor understanding of the reason.)
- Question 4 (b)(ii) State difference between ring and lighting circuit. (Several candidates believed that one circuit was in parallel, the other in series.)
- Question 5 (b)(i) Calculate time of travel for ultrasound. (Some candidates extracted the wrong data from the graph.)
- Question 6 (c)(iii) Meaning of equivalent dose. (Several candidates failed to explain this Learning Outcome clearly.)
- Question 8 (b)(ii) Explanation of AND gate function.
- Question 9 (a)(ii) Calculation of distance travelled using speed–time graph.
- Question 12 (b)(i) Efficiency calculation. (Several candidates had difficulty calculating the input power.)
- Question 13 (b) Calculation of final speed of falling package. (Some candidates were unable to substitute the correct values into the relationship.)
- Question 15 (a)(ii) Using Newton's Third Law to explain rocket propulsion.

Advice to centres for preparation of future candidates

It is important for candidates to be well prepared and have a good knowledge of the Course content. This includes content described by all of the Outcomes contained in the Arrangements document.

Routine practice and rehearsal of the variety of question types present in the examination would allow greater success.

In particular, where an explanation or description is required to answer a question, candidates should always read over the answer to ensure that it is a *complete* response. Candidates should also make sure that their answer is commensurate with the amount of marks allocated to the question.

Using past papers and marking instructions to become familiar with the type of physics language and expressions used at this level would help candidates to construct their responses to such questions.

Care should be taken where numerical answers require units to be converted before calculating the final answer.

Data and values for answers which require to be extracted from graphs or tables should be carefully checked before use in a relationship.

Centres should also try to accustom candidates to set out their working clearly for questions requiring calculations, to allow Markers to apportion partial marks to the answer.

The marking instructions published on SQA's website illustrate the 'standard 2 Marker' type of question, and how marks are apportioned to responses.

Statistical information: update on Courses

Standard Grade

Number of resulted entries in 2010	14,571
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Number of resulted entries in 2011	14,442
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Statistical Information: Performance of candidates

Distribution of overall awards

Grade 1	31.1%
Grade 2	27.8%
Grade 3	21.0%
Grade 4	7.4%
Grade 5	5.3%
Grade 6	6.2%
Grade 7	0.3%
No award	1.0%

Grade boundaries for each assessable element in the subject included in the report

Assessable Element	Credit max mark	Grade boundaries		General max mark	Grade boundaries		Foundation max mark	Grade boundaries	
		1	2		3	4		5	6
KU	50	36	26	40	22	16	40	13	n/a
PS	50	31	20	40	23	19	40	16	n/a